CEO Endorsement (CEO) entry ? Full Sized Project ? GEF - 7

Promotion of circular economy in the textile and garment sector through the sustainable management of chemicals and waste in Lesotho, Madagascar and South Africa

Part I: Project Information

GEF ID
10543

Project Type
FSP

Type of Trust Fund
GET

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Promotion of circular economy in the textile and garment sector through the sustainable management of chemicals and waste in Lesotho, Madagascar and South Africa

Countries
Regional, Lesotho, Madagascar, South Africa

Agency(ies)
UNIDO

Other Executing Partner(s)
National Executing Entities (NEE): Ministry of Tourism, Environment and Culture of Lesotho, Directorate of the promotion of Blue and Green Economy in the Ministry of Environment and Sustainable Development of Madagascar, National Cleaner Production Centre of South Africa (NCPC-SA) of South Africa Regional Executing Entity (REE): Africa Institute for the Environmentally Sound Management of Hazardous and Other Wastes

Executing Partner Type
Government

GEF Focal Area
Chemicals and Waste

Taxonomy
Focal Areas, Chemicals and Waste, Open Burning, Persistent Organic Pollutants, New Persistent Organic Pollutants, Uninentional Persistent Organic Pollutants, Green Chemistry, Industrial Emissions, Best Available Technology / Best Environmental Practices, Sound Management of chemicals and waste, Disposal, Waste Management, Industrial Waste, Hazardous Waste Management, Influencing models, Strengthen institutional capacity and decision-making, Deploy innovative financial instruments, Demonstrate innovative approache, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Stakeholders, Local Communities, Beneficiaries, Private Sector, Large corporations, SMEs, Financial intermediaries and market facilitators, Individuals/Entrepreneurs, Type of Engagement, Partnership, Consultation, Participation, Information Dissemination, Communications, Education, Awareness Raising, Strategic Communications, Public Campaigns, Behavior change, Civil Society, Non-Governmental Organization, Academia, Community Based Organization, Gender Equality, Gender results areas, Participation and leadership, Access to benefits and services, Capacity Development, Knowledge Generation and Exchange, Gender Mainstreaming, Women groups, Sex-disaggregated indicators, Gender-sensitive indicators, Capacity, Knowledge and Research, Learning, Theory of change, Knowledge Generation, Course, Workshop, Training, Innovation, Enabling Activities, Knowledge Exchange, Field Visit, Twinning, Conference

Sector
Mixed & Others

Rio Markers
Climate Change Mitigation
Climate Change Mitigation 0

Climate Change Adaptation
Climate Change Adaptation 0

Submission Date
2/25/2022

Expected Implementation Start
9/1/2022

Expected Completion Date
8/31/2027

Duration
60In Months

Agency Fee($)

703,000.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CW-1-1	Strengthen the sound management of industrial chemicals and their waste through better control, and reduction and/or elimination	GET	7,400,000.00	47,433,838.00
		Total Project Cost($)	**7,400,000.00**	**47,433,838.00**

B. Project description summary

Project Objective

To promote the concept of circular economy (CE) in the textile and garment (TG) sector of Lesotho, Madagascar and South Africa through value chain approach that addresses the sector?s upstream: resource use; green and sustainable chemistry as well as downstream by the reuse, recycling and conversion of textile/garment discards and related wastes into economically viable and socially beneficial products and services.

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
1. Strengthening of regulatory and institutional capacities for adoption and promotion of Circular Economy in the textile and garment (TG) sector.	Technical Assistance	Strengthened regulatory and institutional framework and capacities for adoption of Circular Economy in the TG sector.	Output 1.1: Chemical Inventories for POPs and Technical guidelines for environmental sound management of POPs chemicals and wastes	GET	500,000.00	3,204,989.00
			Output 1.2: Standard operating procedures (SOPs) and checklists concerning POPs pollution prevention and control			
			Output 1.3: Techno-economic feasibility of BAT/BEP and RECP options			
			Output 1.4: Training and Capacity building in BAT/BEP, RECP and Circular Economy.			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
2. Efficient and POPs-free textile manufacturing process through the implementation of BAT/BEP and RECP investments.	Technical Assistance	BAT/BEP/RECP and Circular Economy concept are implemented through technical assistance in selected textile production facilities for the ESM and prevention / reduction of POPs, hazardous chemicals and wastes while improving process efficiency and profitability at plant level.	?Output 2.1: Technical guidelines for environmental sound management of POPs chemicals and wastes Output 2.2: Standard Operating Procedures (SOPs) and Checklists for POPs pollution prevention and control Output 2.3: Techno-economic feasibility of BAT/BEP and RECP options Output 2.4: Training and Capacity building in BAT/BEP, RECP and Circular Economy.	GET	640,200.00	4,103,668.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
2.	Investment		Output 2.5: BAT/BEP and RECP options identified and implemented in at least one facility for each country.	GET	700,000.00	4,486,985.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
3. Introduction of Circular Economy concept for uPOPs emission reductions through ESM of textile and garment wastes and pilot demonstration of textiles/garment wastes recycling and reuse.	Technical Assistance	BAT/ BEP and Circular Economy concept are implemented through technical assistance in selected TG and recycling facilities for the reuse, recycling and ESM of textile and garment wastes.	Output 3.1 Environmentally sound management (ESM) plan for textile/garment waste. Output 3.2: Training and capacity building in ISWM and BAT/BEP for ESM of textile and garment wastes. Output 3.3: Financing mechanisms and business models for circular economy. Output 3.4: Techno-economic feasibility study of BAT/BEP options for recycling/reuse of textile and garment wastes. Output 3.5: Socio-economic impact assessment of project intervention Output 3.6: Partnership and cooperation mechanism supply chain management	GET	888,500.00	5,695,266.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
3.	Investment		Output 3.7: BAT/BEP demonstration for ESM of POPs chemicals and textile/garment wastes	GET	3,500,000.00	22,434,923.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
4. Knowledge management for scaling up.	Technical Assistance	Upscaling of project results to global textile and garment sectors and reporting to MEAs via access to knowledge.	Output 4.1: National capacity and awareness programs developed and implemented to increase ability of textile sector and policy makers to control POPs and CoCs	GET	571,300.00	3,662,020.00
			Output 4.2: Regional and Global Knowledge Exchange and Management tools produced and accessed by users globally			
			Output 4.3: Gender and Social Action Plan implemented, and benefits accrued to women workers			

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
5. Monitoring and evaluation.	Technical Assistance	M&E framework in accordance with UNIDO and GEF requirements	Output 5.1: Project progress monitoring and reporting	GET	300,000.00	1,922,993.00
			Output 5.2: Mid-term and terminal evaluations results shared with stakeholders			
				Sub Total ($)	**7,100,000.00**	**45,510,844.00**

Project Management Cost (PMC)

GET	300,000.00	1,922,994.00
Sub Total($)	**300,000.00**	**1,922,994.00**
Total Project Cost($)	**7,400,000.00**	**47,433,838.00**

Please provide justification

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministry of Tourism, Environment and Culture of Lesotho	In-kind	Recurrent expenditures	1,500,000.00
Recipient Country Government	Ministry of Environment and Sustainable Development of Madagascar	In-kind	Recurrent expenditures	2,870,000.00
Recipient Country Government	Ministry of Industrialization, Trade and Consumption of Madagascar	In-kind	Recurrent expenditures	1,000,000.00
Recipient Country Government	Ministry of Public Health of Madagascar of Lesotho	In-kind	Recurrent expenditures	500,000.00
Recipient Country Government	Department Forestry, Fisheries and the Environment Of South Africa	In-kind	Recurrent expenditures	664,403.00
Recipient Country Government	National Cleaner Production Centre of South Africa (NCPC-SA) of South Africa	In-kind	Recurrent expenditures	244,667.00
Private Sector	Formosa Lesotho	In-kind	Recurrent expenditures	720,000.00
Private Sector	Formosa Lesotho	Equity	Investment mobilized	1,000,000.00
Private Sector	Hippo Knitting Lesotho	In-kind	Recurrent expenditures	720,000.00
Private Sector	Hippo Knitting Lesotho	Equity	Investment mobilized	1,000,000.00
Private Sector	Nien Hsing Lesotho	In-kind	Recurrent expenditures	720,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Private Sector	Nien Hsing Lesotho	Equity	Investment mobilized	1,000,000.00
Private Sector	Tzicc Clothing Lesotho	In-kind	Recurrent expenditures	720,000.00
Private Sector	Tzicc Clothing Lesotho	Equity	Investment mobilized	1,000,000.00
Private Sector	Lesotho Precious Garments (PTY) LTD	In-kind	Recurrent expenditures	720,000.00
Private Sector	Lesotho Precious Garments (PTY) LTD	Equity	Investment mobilized	1,000,000.00
Private Sector	TROPIC KNITS	In-kind	Recurrent expenditures	878,603.00
Private Sector	TROPIC KNITS	Equity	Investment mobilized	532,723.00
Private Sector	AQUARELLE	In-kind	Recurrent expenditures	20,000.00
Private Sector	AQUARELLE	Equity	Investment mobilized	2,093,004.00
Private Sector	EPSILON	In-kind	Recurrent expenditures	1,277,118.00
Private Sector	EPSILON	Equity	Investment mobilized	1,880,459.00
Private Sector	Belgotex Floorcoverings (Pty) Ltd South Africa	In-kind	Recurrent expenditures	1,571,506.00
Private Sector	Brits Nonwoven South Africa	Equity	Investment mobilized	800,000.00
Private Sector	Dyefin Textiles South Africa	In-kind	Recurrent expenditures	1,000,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Private Sector	Dyefin Textiles South Africa	Equity	Investment mobilized	1,000,000.00
Private Sector	Gelvenor Textiles South Africa	In-kind	Recurrent expenditures	790,230.00
Private Sector	Gelvenor Textiles South Africa	Equity	Investment mobilized	790,230.00
Private Sector	Hammarsdale Knitting South Africa	In-kind	Recurrent expenditures	1,000,000.00
Private Sector	Migra Fabrics South Africa	In-kind	Recurrent expenditures	500,000.00
Private Sector	Migra Fabrics South Africa	Equity	Investment mobilized	500,000.00
Private Sector	Opportunity Clothing South Africa	In-kind	Recurrent expenditures	1,000,000.00
Private Sector	Romatex Textiles South Africa	In-kind	Recurrent expenditures	1,250,000.00
Private Sector	Romatex Textiles South Africa	Equity	Investment mobilized	1,250,000.00
Other	Lesotho Textile Exporters Association (LTEA)	In-kind	Recurrent expenditures	3,816,000.00
Other	Lesotho Textile Exporters Association (LTEA)	Equity	Investment mobilized	5,300,000.00
Other	The National Research Centre for Environment (CNRE) Madagascar	In-kind	Recurrent expenditures	115,000.00
Other	The National Council of Women in Madagascar (NCWM)	In-kind	Recurrent expenditures	235,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Other	The National Council of Women in Madagascar (NCWM)	Equity	Investment mobilized	587,500.00
Other	Madagascar Standards Bureau (BNM)	In-kind	Recurrent expenditures	15,000.00
Other	National Centre for Industrial and Technological Research (CNRIT) Madagascar	In-kind	Recurrent expenditures	245,000.00
Other	The Economic Development Board of Madagascar	In-kind	Recurrent expenditures	160,015.00
Civil Society Organization	NRDC (Natural Resources Defense Council)	In-kind	Recurrent expenditures	1,462,500.00
Civil Society Organization	NRDC (Natural Resources Defense Council)	Grant	Investment mobilized	1,125,000.00
Other	Cambridge University Circular Economy Centre (CEC)	In-kind	Recurrent expenditures	25,500.00
Other	Sustainable Fashion Academy (SFA)	In-kind	Recurrent expenditures	9,380.00
Other	Zero Discharge of Hazardous Chemicals (ZDHC)	In-kind	Recurrent expenditures	425,000.00
Other	Africa Institute for Environmentally Sound Management of Hazardous and other Wastes?(Africa Institute)	In-kind	Recurrent expenditures	200,000.00
GEF Agency	UNIDO	In-kind	Recurrent expenditures	150,000.00

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
GEF Agency	UNIDO	Grant	Investment mobilized	50,000.00
			Total Co-Financing($)	**47,433,838.00**

Describe how any "Investment Mobilized" was identified

As per GEF co-financing guidelines, investment mobilized is co-financing that exclude recurrent expenditures. Investment mobilized was identified mainly from the commitment of the private sector. The private sector was requested to provide co-financing letters to show interest, commitment and sources of co-financing provided for the pilot projects. Co-financing is a condition for pre- selection of pilots and pilot companies were informed that they would be required to provide co-financing to participate in the project. Due to the national impacts of the COVID-19 pandemic, country co-financing contribution differs among the countries, however, efforts will be made during the project inception phase to obtain additional co-financing. Through the consultation meetings held to develop the PIF and during the PPG phase, the Governments committed to invest to support the project's objective. This is through the Government?s conducive investment friendly program, attracting more investments and foreign capital and through their involvement in developing and strengthening of regulatory and institutional capacities, incentive scheme for promotion and sustainability of circular economy in the TG sector. A significant amount of co-financing has been mobilized during the project preparation grant phase and additional co-financing from other partners is expected to materialize during implementation, totaling 47,383,838 USD. This co-financing is the result of extensive consultations with public and private partners before and during PPG to identify needs and shared priorities where the GEF grant could have the largest impact. There is confidence that this co-financing and investment will materialize. Financial intermediaries and institutions will be engaged under Component 3. It is still expected that the project will be able to deliver on all planned activities in the project document even if this full co-financing amount does not materialize. The project will report on the co-financing figures in the PIRs and in the MTR and TE reports. The main partners and service providers committed to the project through their co-financing letters. Cambridge University Circular Economy Centre (CEC) will assist in developing new business models and financial mechanisms for the promotion of circular economy, provide executing services for training of trainers (ToT), the development of tools, school curricula and university research programmes. ICLEI Africa will provide services related to CE policy and legislation in the continent, Sustainable Fashion Academy (SFA) will provide services related to the development of relevant toolkits, ToT on sustainable apparel and development of business cases for supply chain management and circular economy and Zero Discharge of Hazardous Chemicals (ZDHC) will build capacity on good chemical management practices and the he project will benefit from their training programmes and workshops. UNIDO in talks with international brands and have the commitment of ASOS to support this project (Letter of commitment is provided). Bi-lateral contributions are being explored through collaboration and partnership programmes. There is advance ongoing talks with AfDB for the African Development Fund (ADF).

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNIDO	GET	Lesotho	Chemicals and Waste	POPs	2,350,000	223,250	2,573,250.00
UNIDO	GET	Madagascar	Chemicals and Waste	POPs	2,350,000	223,250	2,573,250.00
UNIDO	GET	South Africa	Chemicals and Waste	POPs	2,700,000	256,500	2,956,500.00
				Total Grant Resources($)	**7,400,000.00**	**703,000.00**	**8,103,000.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

200,000

PPG Agency Fee ($)

19,000

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNIDO	GET	Lesotho	Chemicals and Waste	POPs	50,000	4,750	**54,750.00**
UNIDO	GET	Madagascar	Chemicals and Waste	POPs	75,000	7,125	**82,125.00**
UNIDO	GET	South Africa	Chemicals and Waste	POPs	75,000	7,125	**82,125.00**
				Total Project Costs($)	**200,000.00**	**19,000.00**	**219,000.00**

Core Indicators

Indicator 9 Reduction, disposal/destruction, phase out, elimination and avoidance of chemicals of global concern and their waste in the environment and in processes, materials and products (metric tons of toxic chemicals reduced)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
5.50	5.50	0.00	0.00

Indicator 9.1 Solid and liquid Persistent Organic Pollutants (POPs) removed or disposed (POPs type)

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
SelectPerfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	5.50	5.50		

Indicator 9.2 Quantity of mercury reduced (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.3 Hydrochloroflurocarbons (HCFC) Reduced/Phased out (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.4 Number of countries with legislation and policy implemented to control chemicals and waste (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
3	3		

Indicator 9.5 Number of low-chemical/non-chemical systems implemented, particularly in food production, manufacturing and cities (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Indicator 9.6 Quantity of POPs/Mercury containing materials and products directly avoided

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
4,000.00	4,000.00		

Indicator 10 Reduction, avoidance of emissions of POP to air from point and non-point sources (grams of toxic equivalent gTEQ)

Grams of toxic equivalent gTEQ (Expected at PIF)	Grams of toxic equivalent gTEQ (Expected at CEO Endorsement)	Grams of toxic equivalent gTEQ (Achieved at MTR)	Grams of toxic equivalent gTEQ (Achieved at TE)
11.50	11.50		

Indicator 10.1 Number of countries with legislation and policy implemented to control emissions of POPs to air (Use this sub-indicator in addition to Core Indicator 10 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
3	3		

Indicator 10.2 Number of emission control technologies/practices implemented (Use this sub-indicator in addition to Core Indicator 10 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	4,400	4,800		
Male	3,600	3,200		
Total	8000	8000	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Part II. Project Justification

1a. Project Description

A1. Changes in alignment with the project design with the original PIF

The project design remains the same as at PIF and no major changes are required. Some changes to the output descriptions have been made to improve clarity. This includes Output 2.2 to include chemical inventories due the outcome of the PPG assessments which show the lack of clear data and information of the chemicals used in the facilities.

The National Executing Entity in South Africa changed from the Department of Trade and Industry to NCPC-SA based on the recommendation of the Government of South Africa.

Based on the necessary information that has been gathered from intensive and extensive consultation with various stakeholders during PPG phase, the budget allocation was modified as per the table below. As the PPG phase determined the lack of data and information regarding the use of POPs and CoCs in the textile and garment value chains of the country, more money has to be allocated to Component 2 to establish chemical management systems and inventories.

Components	PIF		CEO Endorsement	
	GEF Budget	Co-financing	GEF Budget	Co-financing
1	700,000	4,000,000	500,000	3,204,989
2	1,100,000	8,000,000	1,340,200	8,590,653
3	4,400,000	26,000,000	4,388,500	28,130,189
4	600,000	3,500,000	571,300	3,662,020

A1. Global environmental and/or adaptation problems, root causes and barriers that need to be addressed

A2.1 Global environmental problem

The textile and garment (TG) industry is globally important, providing many jobs, foreign exchange revenue, and products essential to human welfare. The value of textiles to human society goes beyond their utilitarian benefits, warmth and comfort. How people dress and adorn their living spaces are important aspects of people's cultural and individual identity.[1][1] Africa has a growing Textile and Garment industry sector with many countries showing a marked increase in raw materials supply, manufacturing, and consumer retail consumption. Many companies who operate global supply chains

of which some parts of these brands operate within Africa, and they may be in the textile manufacturing, garment production as well as retail sector.

Worldwide, the USD 1.3 trillion clothing industry employs more than 300 million people along the value chain, and the production of cotton alone accounts for almost 7% of all employment in some low-income countries.[2][2] The textile and garment sector covers all activities that are involved in the production, distribution, selling, and consuming of textile products (see Figure 1 below). The value chain starts with the fibre production that can be either the growth of cotton or the extraction of crude oil into the manufacturing of fibres, followed by yarn and fabric production, bleaching, dyeing, and finishing of fabric, garment assembly, retail, up to the end of life of textile products. It is estimated that the industry?s market value chain will increase to 1,412.5 billion USD by the end of 2028, with and annual growth rate of 4.4%[3][3]. The textile and garment value chain involves different stages of production[4][4]:

? Fabric assembly factories (garment)

? Processing factories where materials are turned in fabrics ready for assembly through printing, dying, laundering and embroidery.

? Processing facilities where spinning, knitting and weaving take place. Dyes and bleach can also treat yarns.

? Raw material suppliers

Fabric production stage is where materials are turned in fabrics ready for assembly through printing, dyeing, laundering and embroidery. Key steps such as dyeing are commonly applied to fabrics before being sent to garment assembly. However, wet processing steps - including dyeing - can also occur both earlier and later in the life cycle. For example, wool fibre typically goes through a shrink-proofing chemical step in Fibre Preparation before being processed into yarn. Another example is ?sizing?, which includes applying natural or chemical inputs on yarns to strengthen them, so that they can withstand the tension applied during the weaving process. After weaving, ?desizing? is performed to remove sizing chemicals from the woven fabrics. The dyeing process usually performed by production units referred to as ?dye houses? and using a range of dyeing techniques can be applied to fibres, yarns, woven, knitted or non-woven fabrics, or even to a finished garment. A prominent example of yarn dyeing is with denim, where the warp yarn (running lengthwise) is traditionally dyed blue, while the weft yarn (running crosswise) is white. Printing (including digital printing) is also considered a wet process, and imparts color using inks and pigments, typically on the fabric before garment assembly, or on the finished garment. ?Finishing? is usually the final step in wet-processing operations and is used to improve the look, softness, or performance of the fabric or garment, for example, stain resistance, water repellence, anti-microbial. Laundering is also a common wet process for finished garments. While being machine-driven, there is typically as well a moderate level of labor involved. Wet processing, particularly dyeing and printing, can also be performed on an artisanal level, for instance batik dyeing and block printing. At this stage some waste offcuts can be generated which is usually the edge of the textiles being cut off for consistency. This was typically landfilled or recycled depending on the region of the dye house.

Garment Manufacturing/textile production stage is labor-intensive and primarily involves cutting fabric, sewing, ironing, and packaging, as well as processes mentioned in wet processing such as laundering and printing. This stage consists of the bulk of the textile waste as many offcuts are generated here.

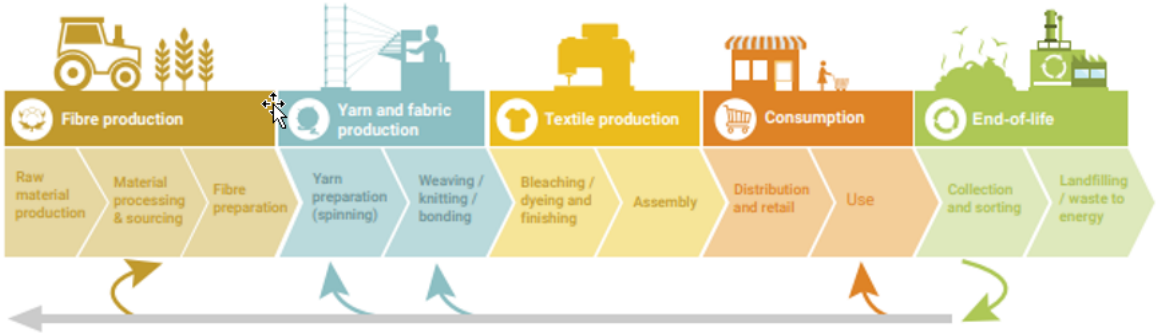


Figure 1: Linear representation of the different stages along the textile and garment value chain

The growth of the sector directly leads to an increase in the production and consumption of the chemicals used in the sector.[1] The industry?s global chemicals market value is estimated to increase to 33.4 billion USD by the end of 2027. Besides apparel and footwear, demand is also rising for technical textiles used in various sectors such as construction, building, automobile, protective equipment, furniture, medical, hygiene, or sporting ? increasing the demand for technical, and frequently hazardous, chemicals.

This increase in the industry?s market value is closely associated with the global trend of textiles and garments sector?s items being produced for a shorter lifespan, and on larger quantities, notably in fast fashion. Therefore, quantities of chemicals used and released are rising, further waste is generated, and the production of the textile fibres is using a growing number of resources.

Besides agrochemicals for fibre production, chemicals are mainly used at the textile wet processing (bleaching, dyeing, and finishing) stage. More than 3,500 different chemical substances are used to establish the desired properties in the processing of textiles. 750 of these chemicals are classified as hazardous for human health and 440 as hazardous for the environment.[2] Some of these chemicals have been classified as Persistent Organic Pollutants (POPs) under the Stockholm Convention or Chemicals of Concern (CoCs), which are identified as an Emerging Policy Issue (EPI) under the Strategic Approach for International Chemicals Management (SAICM). 2,000 of the 3,500 chemicals used in the textiles sector were analysed, the remaining chemicals were listed as confidential and 15% of these were identified as highly hazardous. Yet, only 20% of these are currently regulated under the EU REACH regulation, which is more comprehensive than regulations in many other regions. Many of these regulations only account for active ingredients noted in the Materials Safety Data Sheets (MSDS). Still, they do not address impurities or by-products that may occur in the formulations. Furthermore, although the convention restricts the use and production of POPs, exemptions exist and are still in force in Africa.

These hazardous chemicals are known to cause cancer (carcinogens) and disrupt hormonal systems (endocrine disrupting chemicals, EDCs) in humans and animals, and are released to the local and global environment during all phases in the textile life cycle (production, use, disposal, and as recycled products); thus, impacting the environment and the health of workers, communities, and consumers. The wet processing stage (bleaching, dyeing, and finishing) has been identified as an environmental ?hotspot? in life cycle assessments in terms of ecosystem, human health, and climate impacts[3] due to the high use of chemicals and of fossil fuel-derived energy at this stage. The chemicals used in the wet processing of textiles often contribute to breast cancer and reproductive problems, meaning that women have the highest risk of occupational injuries caused by exposure to hazardous chemicals.[4] Poor chemical management also translates into significant economic losses. The value opportunity of eliminating occupational illnesses in the industry by 2030 is estimated at ?7 billion per year.[5][5]

For TG manufacturing, large amounts of water are needed, resulting in large quantities of contaminated wastewater. The textile dyeing & finishing industry has created an issue of pollution, as it is one of the most chemically-intensive industries, worldwide, and is a major polluter of clean water. The World Bank estimates that, 17% - 20% of industrial water pollution comes from textile dyeing and finishing treatment. Regulatory authorities such as the U.S. Environmental Protection Agency (EPA) and the European Union (EU) have set stringent regulations on dyestuff, which is anticipated to restrain the global textile chemicals market in the near future.[6][6] Plastic microfibers contaminated with CoCs, including POPS, are released into the ocean from washing and chemical management of textiles.

During their life cycle, textiles are also a potential source of emissions of unintentionally produced POPs, including dioxins (PCDD) and furans (PCDF). These PCDD/PCDFs emissions are released during production due to contaminated raw materials, the use of fabric dyes or PCDD/PCDF-contaminated chemicals, boilers and heaters, incineration of process residues, and disposal due to incineration of POPs contaminated textiles and open burning[7][7] [8][8].

Besides air pollution, the presence of POPs at measurable concentrations in final products, also limits the opportunities for recycling and production of new articles from contaminated recyclates. Less than 1% of material used to produce clothing is recycled into new clothing, representing a loss of more than USD 100 billion worth of materials each year. In the US alone the sector creates almost 17m tonnes of waste per year.[9][9] As well as significant value losses, high costs are associated with disposal: for example, the estimated cost to the UK economy of landfilling clothing and household textiles each year is approximately GBP 82 million (USD 108 million). Across the industry, only 13% of the total material input is in some way recycled after clothing use (see Figure **2**). Most of this recycling consists of cascading to other industries and use in lower-value applications, for example, insulation material, wiping cloths, and mattress stuffing ? all of which are currently difficult to recapture and therefore likely constitute the final use.[10][10]

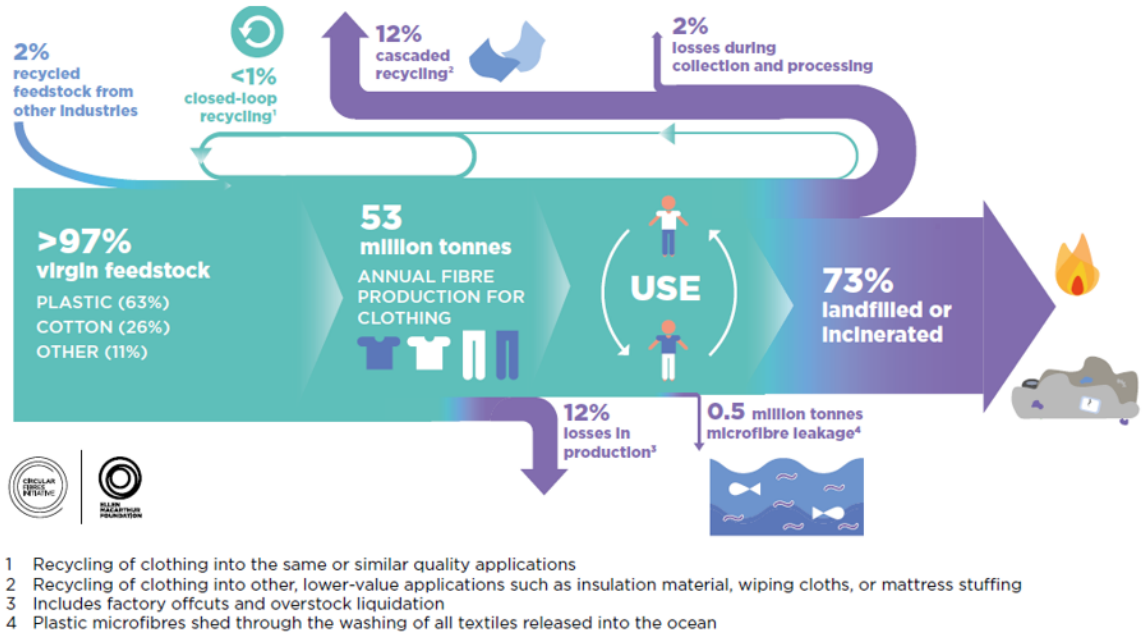


Figure 2: Global Material flows for clothing in 2015

The amount of waste generated, significant value losses and the impact on human health and the environment, making it a priority for transition to circular economy. This transition is only possible if the textile and garment waste can be recycled or reused, which is not possible without reducing and phasing out the use of hazardous chemicals in textile production.

A2.1 Root causes and barriers

Several root causes and barriers to the full implementation of Circular Economy in the TG sector including commitments set by the Stockholm Convention (SC) have been identified in Lesotho, Madagascar and South Africa, the interlinked project problem Tree is shown in the figure below.

Figure 3: Project Problem Tree

All three project countries face similar challenges related to the continued use of hazardous chemicals in the TG value chains, their release during production, use and disposal, generation and disposal of wastes, offcuts and discards, and their impact on human health and the environment.

As presented below, the problem analysis of chemicals and wastes management in the TG value chain has identified three root causes leading up to the key problem. Each root cause underpins specific barriers which must be addressed to reduce use, release and exposure to CoCs including POPs and waste valorization in the TG sector. The barriers lead to two main global environmental problems identified in section ?A2: the continued use of hazardous chemicals in the TG value chain, the amount of waste generated disposed in unsustainable way and their release to the local and global environment during production, use, and disposal. Reduced use of hazardous chemicals during textile production would directly reduce their release into the environment along their lifecycle, enhance the recyclability and reuse of textile and garments wastes, reducing exposure and impact on human health and ecosystems.

The problem tree displays these root causes and barriers (see Figure 3). This project is structured around their mitigation (see section ?A4). The three main root causes are:

Limited Knowledge and Technical Capacity

The lack of transparency and capacity to manage chemicals is the first main root cause for factories, governments, or consumers to act and reduce chemical risks. Non-third-party certified textile processing facilities have a low level of knowledge on the chemicals they use. At higher value chain levels, retailers, brands and assembly facilities do not know what their suppliers are using. This exposes them to reputation, regulatory, and economic risks as they cannot certify clean production and missing opportunities to design safer products. Also, these processing facilities do not have sufficient technical capacity to substitute the use of CoCs and POPs with non-hazardous alternatives, particularly among small and medium enterprises (SMEs) and a significant number of exporting businesses that supply international value chains. This leads either to business as usual, or ?regrettable substitutions?, when one chemical from a group of structurally similar chemicals was removed from the market and replaced by other chemicals from the same group, requiring substantial effort but yielding little benefit in reducing overall risk.[1] For example, PFOS-related chemicals have been largely replaced by structurally similar chemicals derived from long-chain fluorotelomers, which often contain perfluorooctanoic acid (PFOA) ? a fluorochemical listed as a POP in 2019.[2] The most challenging use cases for the textile industry are flame retardants and PFC-based water and stain repellency, where the replacement chemicals do not yet provide the legally required performance on products such as home furnishings, protective workwear or tents.

Furthermore, there is insufficient literature on the amount of generated textile and clothing manufacturing wastes and its export. There is lack of technical capacity for solid waste handling, ISWM, RECP and CE which is leading to most of the wastes, offcuts and discards from the TG industries to be disposed through open burning operations and at dumpsites and improvised landfills.

There is a lack of CE knowledge and implementation in the continent, CE as a concept is still vague in Africa, although case studies exist they have, so far, remained largely hidden. The legal and regulatory frameworks needed to foster circularity are still in their infancy in most African countries as mechanisms to realize the transition towards green economies are often not in place The CE literature in Africa has mainly focused on the management of e-waste and agricultural waste, the recycling of composite materials, renewable energy and the appropriation and acceleration of CE principles by governments and businesses.

Limited Coordination between local, regional and global initiatives

UNEP?s report Sustainability and Circularity in the Textile Value Chain has identified coordination of initiatives as one of the priority actions needed to advance circularity and sustainability in textile value chains. [3] There are different previous and ongoing local, regional and global projects and initiatives but there are limited coordination and low level of knowledge sharing between them. This led to a failure to disseminate research and studies, replicate good practices and lessons learned, and sufficiently to build capacity in the sector. Furthermore, this lack of coordination will lead to duplications resulting in a loss of resources, knowledge and opportunities to scale up.

Global supply chains are starting to focus on sustainability but with uncoordinated, unclear, or unambitious requirements and limited scope. Brands with sustainability commitments focus on climate change, biodiversity, and ocean plastic pollution (see KM baseline section) without explicitly adopting policies on chemical management. Labor issues, including inspection and control processes, focus on garment assembly rather than fabric and textile facilities where the chemicals aspect of occupational health and safety dominate. While chemical management tools and actors (ZDHC, bluesign, Oeko-Tex, Outdoor Brands, etc.) are reasonably coordinated, a relative lack of connection between these tools with broader sustainability agendas undermines faster adoption. Uncoordinated responses have led to multiple solutions being proposed by actors (such as negative- vs. positive-list approaches, duplication through requests for similar sets of CiP information). Confusing SMEs who may not have time, financial or human resources, or inclination to review many different options.

Lacking of Enabling Environment

The policy, regulatory, and financial environments do not provide incentives for the phase out of CoCs and adaptation of CE/BAT/ BEP/ RECP. Competition on costs remains a key driver over sustainability, both for the SMEs and different country governments. Legal and policy frameworks are insufficiently comprehensive and ambitious to incentivize value chain actors or lack the necessary enforcement mechanisms, even though brands cite regulatory levers as important in driving changes to business practices (and are indeed the only driver for companies outside of global value chains and voluntary standards). Regulators have insufficient funding to support the enforcement of existing policies and regulations or develop the needed new regulations or standards. There is little political will to adopt and implement national regulations, complicated by the strategic importance of the sector, which is a major generator of employment, national income, exports, and foreign currency in all the project countries. Additional ?red tape? and initiatives which may impact on the competitiveness of the sector are therefore very challenging to introduce and must be developed in a participatory, systematic, and effective manner to avoid negative economic consequences.

All of these causes have a number of barriers faced by different textile and garment industry actors that prevent the achievement of circular economy in the Textile and Garment sector through chemicals and waste management. The following are the main barrier, which need to be addressed during the project, whose linkages are also shown in Figure 3:

- Insufficient or weak legal and regulatory framework. No specific BAT and BEP legal framework and promotion in the TG industry exists in any of project participating countries.

- Lack of capacity for implementing, enforcing and monitoring rules and standards;

- Limited financial resources and lack of incentives to encourage the adoption of BAT/ BEP/ RECP;

- Information provided by chemicals suppliers is inadequate and prevents factories implementing controls or potential alternatives, including appropriate handling and storage, which can reduce risks of worker exposure or fire even without phase-out of the use of toxic chemicals.

- The textile processing facilities are sceptical of safer alternatives in terms of performance and price, which leads to slow acceptance and adoption across the value chain.

- The tools available to SMEs to identify problem chemicals and feasible alternatives are numerous and confusing.

- Subsidies and financial flows continue to sustain business as usual. Despite growing attention towards sustainability, the lack of strong and ambitious policies from brands at the highest level and incentives from customers fails to create the required enabling environment. The criteria to use chemicals are predominantly price and availability, followed by extended credit terms and quality consistency. The Covid pandemic has led to extreme competition in the sector which forces the facility management to cost-cutting.

- Brominated Flame Retardants (BFR) in textiles depend on the flammability standards in the different production and import countries. For each specific application, the material requirements are defined for ignitability. This triggers the use of BFR.

- TG contains hazardous chemicals that reduces its recyclability and results in low value applications. Governments, brands, civil society organizations and consumers cannot verify and make informed decisions on the sustainability of the textiles products.

- Lack of technical information about Circular Economy, BAT, BEP and RECP options;

- Absence or limited local technical expertise;

- Inadequate physical infrastructure for sound management of solid wastes.

- TG wastes disposal through open burning operations and at dumpsites and improvised landfills.

A1. Baseline Scenario and any associated baseline projects

A3.1 Global and Regional Baseline Scenario

Textiles, clothing, and fashion are part of one of the largest industries in the world economy, generating annual revenues of around 3 trillion USD,[4] employing over 300 million people across the value chain[5](many of whom are women), and providing clothing and other furnishings for over seven billion people inhabiting the planet. Furthermore, garments and textiles represent about 5% of total manufactured goods exported in the world[6]

Many African countries have been experiencing rapid industrialization particularly in the agro-industry and agro-allied sector in which the continent enjoys some comparative advantages due to abundance and low cost of raw materials and labor. The rapid industrialization has resulted partly because of the incentives and opportunities offered by the African Growth Opportunity Act (AGOA), a preferential trade agreement to facilitate exports from African countries to the United States through duty-free entrance of certain products into the United States including textiles. The combined apparel and footwear market in sub-Saharan Africa is estimated to be worth US$ 31 billion, according to data from Euromonitor International. Many African countries had vibrant textile industries, with long-standing links to EU-based brands and retailers. Although the biggest textile-producing countries today are China and India, ?made in Africa? is gaining traction, and many brands are moving their production from Asian to African countries, with Ethiopia positioning itself as a leader in the development of the textile industry in East Africa. Africa's textile and garment industry is optimistic that, its shipments to the United States, the world's biggest market for such products, will surge following the 10-year renewal of AGOA. In 2013, ten countries (all of them located in Eastern and Southern Africa) saw some US$ 2.5 billion in apparel exports from sub-Saharan Africa. With the growing population and expanding middle-classes, the demand for clothing (both local and imported) is expected to rise, it is estimated to grow at a CAGR of ~5% over the forecast period of 2019?2024.10 The textile and clothing industry is the second largest employer after agriculture in Africa. A large percentage of its workforce is made up of women. The industry is labor intensive and offers large employment opportunities, particularly for youth and women.

However, for African countries to be able to benefit maximally from the opportunities offered by AGOA, they also need to minimize the environment impacts and footprints of their businesses in other to remain economically competitive and comply with global standards and norms. Firstly, conventional textile manufacture is associated with excessive consumption of raw materials, water, and energy; use of persistent organic pollutants (POPs) in industrial operations; as well as water and air pollution. [7]Moreover, many textile industries in many African countries are still using POPs chemicals in their industrial operations and due to lack of waste management policy framework and infrastructure; off cuts and textiles discards are either disposed in open burning operations and or in open landfills. The open

burning operations results in the emission of dioxins and furans and greenhouse gases with serious harmful effects on humans and the environment. As big brands are increasingly seeing Africa as a new destination for their production facilities, the risks of replicating the same environmental and social negative outcomes seen in some Asian countries are high.

The textile value chain is long and complex, with apparel producers commonly having more than 1,000 suppliers in several dozen countries.[8] The value chain goes from retailers and brands to spinning, knitting, weaving, bonding, processing, and back to fibre producers and chemical suppliers.

A3.1.1. Textile and garment sector?s chemicals use

Every kg of textiles produced requires an input of 0.58 kg of chemicals and a full quarter of the chemicals produced in the world are used in textiles[9]. This is just one source ? there is no a single figure but the specific consumption of chemicals is always a range, different for instance for the finishing of cotton yarn or cotton fabric (with and without printing).

In wet processing facilities, textiles undergo various chemical treatments to establish their desired characteristics. This includes pre-treatment, dyeing, printing, final finishing, laminating, and coating. For these treatments, the industry consumes various products from commodity chemicals to research-driven specialised products divided into three categories: dyestuffs, textile auxiliaries, and basic chemicals. For final finishing, special chemicals such as flame retardants, water repellents, and biocides are used. POPs are used as durable water repellents (PFAS) and flame retardants (deca-BDE, HBCD, and SCCPs). In wet textile processing, most hazardous substances are used and the non-fixed part is released into the environment, in surface and groundwater, soil and air. CoCs can be released dyeing, printing and final finishing.[10] Products most likely to contain or use POPs and CoCs include technical apparel and outerwear, rainwear, carpets, furniture upholstery, firefighting and military uniforms, safety working clothing and protective gear.[11][11]

As detailed in the global environmental problem section above, there are around 3,500 substances of which 750 are classified as hazardous for human health and 440 as hazardous for the environment. Some of these are classified as CoCs or POPs, listed under the Stockholm Convention, such as: PFOS and PFOA, hexabromobiphenyl (HBB), technical mixtures of tetra- and penta-bromodiphenyl ethers (cpentaBDE), technical mixtures of hexa-, hepta- and octa-bromdiphenyl ethers (c-octaBDE), decaBDE, hexabromocyclododecane (HBCD) and short-chain chlorinated paraffins (SCCPs) [12][12]. A comparative overview of commonly restricted chemicals organizes them into six broad classes (amines, dyes, halogenated chemicals, metals, monomers and solvents). [13][13]

Per- and polyfluorinated alkyl substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) contain bonds between carbon and multiple fluorine atoms. These strong carbon-fluorine bonds give PFAS useful chemical properties for making products oil, stain, water-repellent, or non-stick. These same carbon-fluorine bonds also make PFAS extremely resistant to biological and chemical breakdown and resulted in PFOS and PFOA being listed under the Stockholm Convention. PFAS are found in the bodies of 99% of Americans and are used in a countless number of manufacturing and product applications. For textiles, PFAS are mainly used for oil, stain, and water resistance applications, particularly apparel, footwear, carpets, curtains, backpacks, safety working clothing etc. However, they can also be used in metal plating manufacturing, dye formulations, the manufacture of polytetrafluoroethylene (known as Teflon which is a commercial name), and many, many others.

As a class of substances, PFAS are:

? **Persistent**: Do not break down into safer substances in the environment. We can continue to be exposed from food, drinking water, and products years after a chemical is banned or phased out.

However, often PFAS are part of a bigger molecule and this PFAS part can be separated from the rest of the molecule by biodegradation

? **Mobile**: Travel far and are distributed around the world. PFAS are present in the deep oceans, mountain lakes, and Polar Regions far from where they were produced and used.

? **Bioaccumulative**: Build up in people and animals. Certain PFAS bioaccumulate--they remain in the bodies of humans and animals for years. Bioaccumulative PFAS are most concentrated at the top of the food chain, in marine mammals, birds of prey, and humans.

? **Toxic**: Harmful to humans and ecosystems. The best studied PFAS are PFOA and PFOS; they are linked to liver damage, high cholesterol, obesity, diabetes, cancer, thyroid disease, asthma, immune system dysfunction, reduced fertility, low birth weight, and effects on children?s cognitive and neurobehavioral development.

Risk reduction programmes for PFAS, are being rolled out in OECD countries[14][14], but many of the PFAS continue to be produced and used in other parts of the world, also for in textiles. Market research has identified the textile sector as the biggest user of PFAS with an estimate of 36% of the total market of 26,000 tons in 2015 and projected to continue being on the top of the list in the coming years.[15][15] According to the Swedish Chemicals Agency, for specific textile products, PFAS may be contained to around 2-3% and to 15% weight-% in synthetic carpets respectively.[16][16] A study by Supreeyasunthorn et al.[17][17] shows that PFOS and PFOA migrate from textiles and are released into the environment, with disappearance percentages of 29.8% for PFOS and 99% for PFOA. That same study concluded that, although the average concentration of PFOS found in textile samples was below European Union (EU) Commission regulations (<1 mg m^{-2}), the average concentration of PFOA was 2.74 mg m^{-2}, and 68.75% of textile samples had PFOA concentrations exceeding 1 mg m^{-2}.

Although PFOA and PFOS and their salts are included in the POPs list, as already indicated above, many current alternatives used to replace PFOA and PFOS could release regulated PFOA and PFOS and are considered as ?regrettable substitutions?. Thus, it is important to manage and eliminate this whole class of more than 4,700 substances simultaneously.

Since PFOA and PFOS (C8 or long-chain PFAS) have been added to the global regulatory radar, certain industries have or are in the process of migrating to PFAS chemicals also known as ?C6? and ?C4? or ?short chain PFAS.? These PFAS substances are viewed in the scientific and regulatory communities with extreme caution as they belong to the same PFAS class of chemicals as PFOA and PFOS. As such and with the framework of ?The Precautionary Principle? in mind, there is a growing body of scientific data that these PFAS will surely be determined as regrettable substitutions for C8. Further, they are not as technically proficient as C8, which will most likely lead to increased environmental loading.

As per the AFIRM chemical sheet on PFCs, alternatives to C8-based PFCs are available for most applications in apparel and footwear. The Non-PFC chemistries (such as wax, silicones, acrylic polymers, polyurethanes, dendrimers, and more) are alternatives depending on performance needs. Materials exist that are naturally repellent due to other chemical or mechanical properties. AFIRM states that any alternative selected must be carefully vetted to ensure a regrettable substitution is not made. Any chosen alternative should also be ZDHC MRSL compliant if applicable.[18][18]

Similarly, highly brominated flame retardants have come under scientific and regulatory scrutiny including the Stockholm Convention. These chemicals, though structurally and functionally different

from PFAS, contain bromine-carbon bonds rather than fluorine-carbon bonds. As such, they exhibit similar behavior to PFAS regarding persistence, mobility, bioaccumulation, and toxicity.

The root cause of both is the carbon-halogen bond, which is anthropogenic. Therefore, there are no known natural mechanisms to effectively process these chemicals to non-toxic metabolites that can be recycled into the natural world in a circular fashion.

Therefore, though the deliverables of this project are firmly with PFOS, PFOA, and other PFAS, as well as with brominated flame retardants identified in the Stockholm Convention, we strongly suggest casting a wider net into the sources and use of these substances in the textile industries of Bangladesh, Indonesia, Pakistan, and Viet Nam by applying a ?Class? perspective and model.

The use and possible release of chemicals used in the textile finishing industry is to a certain extent already addressed under the framework of the European Industrial Emissions Directive (IED) and the related Reference Document on Best Available Techniques in the Textiles Industry (Textile BREF)[19][19]. However, the full extent of potentially hazardous substances applied in the sector has not yet been systematically and comprehensively assessed, and until date, no BAT conclusions are available for the textile sector. To minimize the release of hazardous chemicals into the environment (and the exposure of workers) an improved, systematic consideration of hazardous substances in the currently ongoing revision of the 2003 Textile BREF and the compilation of the BAT conclusions has to be achieved. In this context, it is of particular importance to adapt and add BATs for substances with an increased risk potential either in toxicological terms or in terms of environmental fate and behavior. The objective must be that, by complying with the revised Textile BREF and BAT conclusions, public authorities and operators can ensure that the release of substances of concern is at least reduced to a level at which the hazards posed by these chemicals are acceptable. Table 1 provides a classification for the various substance categories relevant to this report.

Table 1: Classification of substances

Hazardous substances	Substances of concern	Relevant substances
Listed CLP Regulation (1272/2008) annex VI (very) persistent, (very) bio-accumulative and/or toxic ? PBT/vPvB Endocrine disruptors Cause negative impacts Listed as a Substances of Very High Concern (SVHC) Listed as a WFD (2000/60/EC) Annex X priority substance	Potential to be released into the environment Low degradability Difficult to eliminate Mobile (low adsorption) May show toxic properties	Specific fate or behavior in the environment

Within the HazBREF[20][20] project, a list of target substances as applied in the textile sector by scanning the ECHA chemical database was identified. Hereby, reference was given to textile specific use categories and additional descriptors obtained from REACH-Registrations (such as descriptions containing the string 'textile*'). As a result, the scan identified around 940 potentially relevant substances. However, a cross-check with the substance used, as derived from the four case studies in Europe, showed that only about one third of the substances identified were actually used. Possible reasons for the low compliance rate may be differences in the definition of usage categories and technical usage descriptors. In addition, several substances not identified in the scan may have been registered for use in other industries, although they may also be used in the textile sector. Further research on substances used in the textile sector is therefore required before data from the ECHA chemical database can be used to review the Textile BREF.

In the absence of a specific tabular list of hazardous chemicals used in the textile industry, competent authorities and operators can refer to a variety of regulatory and voluntary chemical lists, some of which are briefly touched upon in the following.

Regulatory chemical reference lists

The followings lists have been identified:

- ECHA chemical database

ECHA maintains one of the world's largest regulatory databases on chemicals. Users have easy access to information on 120 000 chemical substances on the EU market through three layers: info card, brief profile and source data. However, the data sets for the chemicals vary from very detailed to very few information.

- Priority substances under the Water Framework Directive

In 2018, Directive 2013/39 /EU listed 45 substances (or substance groups) to WFD Annex X (Annex of EU priority substances). The European Commission reviews the list of priority substances every 6 years according to Art. 1 2013/39/EU. In practice, the list was reviewed twice: in 2008 (2008/105/EC) and in 2013 (Directive 2013/39/EU) since the setting of the priority substance list for first time in 2001. Art. 16 par. 2 WFD introduces a scientifically based methodology for selecting priority substances based on their significant risk to or via the aquatic environment.

- REACH SVHC List

Candidate list of substance of very high concern recommended for authorization. This list is updated at regular intervals by ECHA, with the first substances listed on 28 October 2008.

REACH Authorisation List

It contains a list of substances subject to authorization under REACH. Substances on this list are selected from the REACH SVHC list and they cannot be placed on the market or used after a given date ("sunset date"), unless an authorization is granted for their specific use, or the use is exempted from authorization.

- Substances Restricted under REACH

Annex XVII to REACH includes all the restrictions adopted in the framework of REACH and the previous legislation, Directive 76/769/EEC. Each entry shows a substance or a group of substances or a substance in a mixture, and the consequent restriction conditions.

- List of Polluting Substances under Annex II of the Industrial Emissions Directive (IED)

A short list of the most relevant polluting substances under the IED.

- Typical Pollutants (and potential sources) in air emissions from textile processes (Annex V, Textile BREF, 2003)

List of chemical compounds with dangerous properties that are typically present in the waste gas of textile factories. The list also includes possible sources of the listed compounds. This list is contained as an annex in the revised Textile BREF.

Non-regulatory chemical reference lists

- Manufacturing Restricted Substances List (MRSL)

A MRSL is a list of priority chemicals, which specifies the maximum concentration limit of each substance within commercial chemical formulations. The most well-known MRSL was developed by ZDHC brands for the apparel and footwear industry which are used by brands (NIKE, PUMA, Adidas, Levi, etc.) and retailers (C&A, Gap, Inditex etc.). The basic approach is that any hazardous chemicals avoided to be used is the best prevention measures for hazardous chemicals in wastewater, sludges from wastewater treatment, emissions to air, and textile products. Thus, MRSL directly correlate with Restricted Substances Lists (RSL) which limit the presence and content of hazardous substances in marketed textiles (Michel/Kaelble, 2020).

- bluesign? ? bluesign? System Black List (BSBL)

The BSBL sets limit values for chemical substances for specialty chemicals such as textile auxiliaries and colorants. The composition of the substances in the BSBL is an excerpt from the bluesign? TOOL, a web-based software application for chemical assessment and rating.

- ChemSec ? SinList

The SinList is a comprehensive database of chemicals likely to be restricted or banned in the EU. It is publicly available and regularly updated.

- Oekotex STeP MRSL

List of chemical substances prohibited within the framework of the STeP by OEKO?TEX? certification.

Material Safety Data Sheets (MSDS)

Material Safety Data Sheets (MSDS) are a well-introduced/accepted and effective method for the provision of information on chemical substances and mixtures to recipients and users of substances and mixtures in the EU. They further form an integral part of the system of Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). Although the availability of MSDS in the textile sector is generally given, spot checks of MSDS show lapses as well and inconsistencies of the information contained. A particular problem in this context is that chemical suppliers rarely include information regarding the chemical composition of the marketed chemical products which are usually chemical formulations. Furthermore, impurities such as solvents and by-products from previous synthesis or isolation operations, which are contained in chemicals of technical grade, are usually not listed in MSDS. Information gaps can also occur when MSDS are not updated on a regular basis. In this context, a sample review of MSDS used in four selected textile finishing industries shows that the majority of MSDS are older than the three (3) years (59%), with one in three safety data sheets not having been reviewed for more than 5 years (31%). Although end-users are theoretically entitled to demand missing information on chemical substances and particularly formulations/mixtures from their chemical suppliers, they might face practical challenges as the

majority of chemical nowadays are supplied from outside the EU. As a result, the precise assessment of chemical properties and compliance with Industrial Emissions Directive (IED) regulations is often a major challenge for both companies and competent authorities. As per the results of the IMPEL Project on linking the IED and REACH regulations, the collection and evaluation of MSDS may also be complicated by number of chemical substances, as some enterprises use a large variety of chemical products (which are usually formulations (more than 250 at a single site).

Systematic approaches and tools can help operators and competent IED authorities to assess the quality of MSDS. However, only a few are available even in the European market. According to the IMPEL report on linking the IED and REACH Regulation the region of Marche in Italy is one of the first that uses an electronic database for the assessment of MSDS provided by the manufacturer, downstream user, importer, or operator of an industrial installation[21][21]. Other tools for the assessment of MSDS quality include among others a checklist (for both suppliers and recipients) developed by ECHA in cooperation with the (Enforcement) Forum and the online tool MSDS-Check which is specifically designed for recipients of MSDS. To address the challenge of the large varieties of substances used at certain sites, IMPEL furthermore recommends the development of a procedure for prioritization.

To close potential information gaps in MSDS, it is recommended to further specify the current REACH regulations with respect to the information contained in the MSDS. To this regard, especially aspects such as bio-degradability data and mixture composition should be considered. While there is no time-bound obligation to revise the MSDS, it is still highly recommended to check whether they are up to date on a regular base. In this context the ZDHC Chemical Management System (CMS) Guideline and international brands refer to a proof of review at least every three years. MSDS generally remain up to date until new information is available in accordance with Article 31 (9) of the REACH Regulation. Suppliers shall update the safety data sheet immediately as soon as (1) new information which may have an impact on risk management measures or new information on hazards becomes available, (2) an authorization has been granted or refused or (3) a restriction has been imposed. The new, dated version of the information shall be marked "Revised on (date)" and made available free of charge on paper or electronically to all previous customers to whom suppliers have supplied the substance or mixture in the previous 12 months. Annex 7.4 provides a selection of commented Best Practice MSDS, which additionally contain recommendations for the specific use of MSDS information in the context of permit requirements.

Chemical inventories

Textile finishing industries use a considerable number of chemical products. To allow for an effective chemical management, it is therefore necessary to clearly identify what chemicals are used, how they should be used, and what substitutes can be used in their place. This requires that established inventories are continuously updated and archived. Chemical Inventories allow among other things for a targeted compilation and assessment of chemical related information, which can serve the specific information requirements of different organizational units within the installation. They can also serve as an important reference and information tool for stakeholders such as IED permitting authorities (e.g. to assess compliance with lists of restricted substances or other chemical related regulations), thus going beyond the mere purpose of fulfilling storage requirements.

To ensure the availability and completeness of all information necessary for a responsible chemical management that can be used for both internal and external requirements, the inventory should include all substances present throughout the production cycle (raw materials, intermediates, products, by-products, solvents, waste, etc.).

A3.1.2. Textile and garment wastes

Discarded textile products can be handled in different ways and by different types of organizations: collected by charitable organizations as donations, by commercial organizations - including retailers - either as donations or in exchange for a ?reward?, or by municipalities, either as a separated fraction or as unsorted waste. Infrastructure for collection varies in terms of extent and efficiency, thus resulting in

large differences among countries. In some of the largest economies of the world (e.g. USA and China), collection rates range from merely 10% to 15%, whereas in many low-income countries in Asia and Africa, no collection infrastructure can be found whatsoever. However, a couple of European countries have significantly higher collection rates, especially Germany with about 75 % (bvse, 2015) followed by Denmark (44 %), the Netherlands (37 %) and France (36 %) (ECAP, 2018). As most second-hand textiles from high-income countries are exported to those regions, this represents a major issue as they lack the means and infrastructure to dispose the waste[22][22]. In African countries second-hand clothing is increasingly exported with the clothing waste leaving a devastating impact on those countries. In the capital of Ghana, Accra Metropolitan Assembly picks up around 70 metric tons of imported clothing waste from Kantamanto market every day, six days a week. A lack of capacity to collect and recover textiles leads to clothing being disposed of informally ? meaning it is burned and the ashes are swept into the gutters, where it makes its way to the sea; or it is brought to ?informal? dumpsites. The total impact of leaching dyes, chemicals, and microfibres on the environment, people?s health, and biodiversity loss is significant[23][23].

For used textile products disposed as unsorted waste, the material can either be incinerated - and thus potentially contribute to some degree of energy recovery - or be added to landfill. However, even sorted textiles can end up in incineration or landfill, for example in cases of oversupply of second-hand garments where no markets or alternative use is available at a cost-efficient level. Unsold retail stock can sometimes be destroyed through incineration or sent to landfill. A study by UNIDO Switch Med programme of the textile waste mapping in Morocco and Tunisia showed that more than 60% of the total textile waste generated by textile processes is cutting waste and 20% of total waste is made up of finished products, whether deadstock or overproduction. The waste clothing still contains various chemicals from finishing, most visibly the dyestuffs but also optical brighteners, and the chemicals applied for so-called final finishing. The latter concern manifold chemical as they provide certain properties to the textile products such as softness, wrinkle resistance, water repellency, dirt repellency, flame retardancy, and biocidal properties. There are few chemicals applied which fall under POPs.

The recycling process can be traced back to the manufacturing/production stage of yarn to the post-consumer where the garment is discarded by the consumer to the landfill site where some of this waste is again collected and processed back into the circular waste loop. The typical process according to the PPG study is that most of the activity occurs between the fabric manufacturer and the garment manufacturer and very little at post-consumer stage. The textile and garment industry value chain basic model in South Africa is accordingly as illustrated in Figure 4 below.

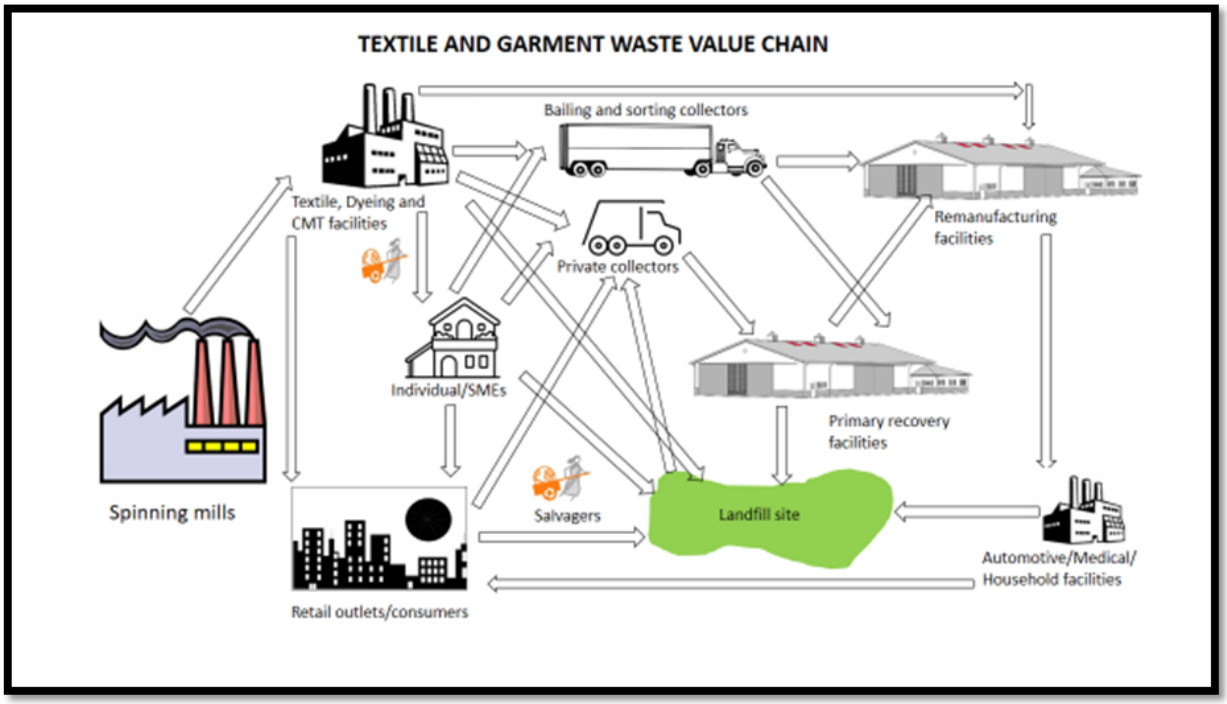


Figure 4: TG waste value chain in South Africa

In most cases with hazardous chemical free textiles, products have a chance to return into circulation in their current form - in which case the products can be considered as having reached end-of-use and not yet end-of-life - or in a downgraded form where at least the material is to some extent recovered and put into another use.

A3.1.1. Wastewater pollution

Textile production (including cotton farming) uses around 93 billion (93 million in Europe) cubic meters of water annually, which is about 4% of global freshwater withdrawal. Garment manufacturing uses over 66% of this water. Each year, around 0.5 million tonnes of plastic microfibers, equivalent to more than 50,000 million plastic bottles, resulting from textiles washing are estimated to be released into the ocean.

One of the main impacts of the use of hazardous chemicals in the textile value chain is improperly managed wastewater containing hazardous chemicals causing water pollution. Toxic chemicals, such as alkylphenols and PFAS are particularly problematic as wastewater treatment plants cannot degrade them, and microfibers in the wastewater can carry POPs and result in leaching of toxic substances, such as dyes and fire retardants.[1] The textile finishing industry also consumes high volumes of water, with total consumption estimated to be around 215 trillion litres per year[2] corresponding with 50 ? 250 L/kg (as the usual range); natural fibre production (cotton cultivation) and the consumer use phase account for a particularly significant portion of the water scarcity impact of the sector.[3] Further, the textile industry is not a high-tech sector of the industrial economy, often with outdated or absent infrastructure.

A3.1.2. Climate Change impact of the TG sector

The climate impact of the global apparel industry is substantial, with one source finding that the global apparel and footwear industries accounted for an estimated 8% of the world?s greenhouse gas emissions in 2016.[4] Beside aluminum, the production and use of textiles are associated with most greenhouse gas emissions per kilogram (Kissinger et al., 2013). . In 2015 alone, the industry?s greenhouse gas (GHG) emissions from textiles production totaled 1.2 billion tonnes (1,200 million

tonnes in Europe) of CO_2 equivalent, more than all international flights and maritime shipping emissions together[5]. The high carbon footprint results from high energy consumption for textile production and during the consumer use phase and from the type of energy used (Sandin et al., 2019; Sch?nberger, 2019). Figure 5 shows the carbon footprint along with the specific energy and water consumption for the most important six different types of fibres. The percentage of energy consumption and CO_2 emissions respectively are highest for synthetic fibres and for wool whereas they are significantly lower for cotton and hemp.

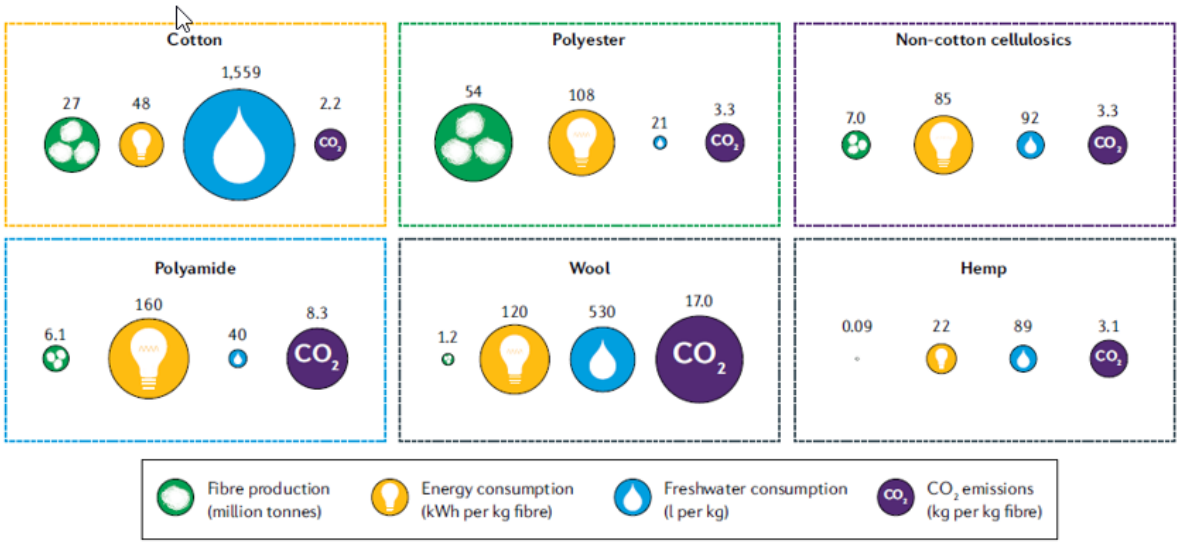


Figure 5 : Carbon footprint, specific energy consumption and specific water consumption of six important fibres (Niinim?ki et al., 2020)

Across the global apparel value chain, the wet processing stage has the highest climate impact. Large volumes of water need to be heated, causing this stage to be very energy intensive. This stage also uses the largest amount of (often hazardous) chemicals and is a hotspot for impacts on ecosystem quality and effects on human health. Interventions in this production stage thus have the potential to tackle multiple environmental issues simultaneously.[1]

With the expected increase in production and consumption, the amount of GHG emissions will only rise. African countries rely heavily on fossil fuels for energy generation.[1] According to a report produced by Quantis, increasing re-use, repair/repurposing, and closed-loop recycling will decrease climate emissions across all stages of the value chain except for the use phase.[2]

All project countries are particularly vulnerable to the effects of climate change, climate risk screening in APPENDIX 1 describes the climate vulnerabilities of the three project countries in more detail. Combined with the lack of resources to adequately address vulnerability to climate change, this presents a significant barrier to the sound management of hazardous chemicals and wastes used in the global TG value chain, as TG facilities also risk inundation by floods, cyclones, or sea level rise. This increases the risk of release of hazardous chemicals to the local and global environment by the sector during production, use and disposal as wastes.

A3.1.1. Circularity of the TG value chain

The textile garment (TG) industry sector can transform from the linear ?take-make-use-waste? model to a circular approach that is restorative and regenerative by design. ??A circular economy for fashion and textiles creates better products and services for customers, contributes to a resilient and thriving fashion industry, and regenerates the environment. It prioritizes the rights and justice for everyone

involved in the fashion value chain and will create new opportunities for growth that are distributed more evenly, diverse, and inclusive. We can build a value chain that designs products to be:

- used more and longer
- made to be made again
- made from safe and recycled or renewable inputs[3]

The value chain includes all the activities that provide or receive value from designing, making, distributing, retailing, and using a textile product (or providing the service that a textile product gives). This includes the extraction and supply of raw materials, as well as the activities that are involved with the textile after its useful life. The value chain covers all stages in a textile product?s life, from supply of raw materials through to disposal after use, and includes the stakeholders and activities linked to value creation such as business models, investments, and regulation.

Figure 1 in the Global environmental problem A2.1 section summarizes the typical ?cradle to grave? (take ? make ? waste) life cycle activities for textile products. These activities are often shown as a linear representation from raw material production to end-of-life treatment. While the aim of circularity is to shift into a circular system, the linear model is still more common[4]. The shift requires governments, businesses, and consumers to look beyond the current linear extractive industrial model, and to redefine growth, focusing on positive society-wide benefits. Tracing and phasing out chemicals of concern from TG products is an essential pre-requisite to move the value chain towards more circularity. However, there are gaps that were identified during the PPG notably the lack of information or tools on alternatives to POPs, resource efficiency or recycling, and return on investment for sustainable production,

This starts at design phase, when determining which substances and materials will be used, and whether products are for instance designed for longer use or disassembly. It also impacts end of life decisions: Knowing the composition and chemical content of material for recycling is critical as this determines the application in which the recycled material can be used, as well as for reduce by design, reuse, refurbish, remanufacture, repurpose processes.

The PPG phase identified that in the target countries, there were lack of financial incentives for innovation for TG industry. There is a limited capacity to create business proposals and low awareness of the financial sector on the needs and benefits of funding circular solutions. The activities of this project will address these issues (output 1.2 and output 3.3)

To counter the environmental and social impacts of TG production, initiatives with global scopes have been implemented from the United Nations and beyond. These initiatives are based on the concept of circularity. Initiatives such as the Global Alliance on Circular Economy and Resource Efficiency (GACERE), have been created to advocate for a global just transition to circular economy and resource efficiency, to advance sustainable consumption and production and sustainable and inclusive industrialization. GACERE was initiated in 2020 by the EU and UNEP in coordination with UNIDO. The African Circular Economy Alliance (ACEA), a partner of this project, is a government-led coalition of African nations and global partners committed to advancing the circular economy transition at the national, regional, and continental levels. In 2019, the UN Alliance for Sustainable Fashion was launched to coordinate fashion across the UN system to optimize impact across the Sustainable Development Goals. UNIIDO is a member of the alliance, with its ongoing activities involving stakeholders across the fashion value chain.

There are so many ongoing sustainability initiatives in the TG sector but there is a lack of coordination amongst TG value chain actors. There is a need for a global coordination mechanism to facilitate dialogue between actors, support the development of data and decision support tools to help evaluate progress, and coordinate existing action (see APPENDIX 4 Global Knowledge Management strategy).

A3.1.2. Knowledge management

A baseline analysis on the different knowledge generated and shared on chemicals and sustainable textiles and garments showed that numerous existing knowledge platforms and information sources exist. This mapping exercise has been divided into three sections: global knowledge management platforms; trade fairs, events, and global campaigns; and project websites and components. The full mapping is presented in Appendix 3 on the Knowledge Management Baseline and Strategy developed with UNEP project in Asia (GEF ID 10532).

Under the first section, platforms are listed that provide or share knowledge on chemical use in the TG sector globally. The Green Growth Knowledge Platform provides sector-and country-specific technical and practical knowledge to support a green industrial transformation. Different academies, gateways, and other platforms from service providers (e.g. ZDHC) provide technical training courses, e-learning videos, and other knowledge sources.

Furthermore, different tools have been established to that support the development of inventories, chemical management, the identification of CoCs and alternatives, the connection of buyers and sellers of safer alternatives, and the measurement of companies? sustainability performance and its products?. Restricted Substances List (RSLs) and Manufacturing Restricted Substances Lists (MRSLs) focus on limiting substances contained in final products and in the production process respectively. Some brands follow voluntary RSLs available in the industry like AFIRM, while some rely on their own RSLs to limit and manage chemicals in final products. Some of the most used voluntarily MRSL are developed by ZDHC.

Under trade fairs, events, and global campaigns, there are working groups on chemicals under different outdoor associations (European Outdoor Group), events gathering industry leaders and brands (Copenhagen Fashion Summit, Textile Sustainability Conference). Finally, under the last section of project websites and components, projects and project components that work on sustainable textiles and chemicals use are listed.

This complex landscape of platforms, websites, tools, and guides leaves the local industry confused. Other stakeholders have identified this barrier, The African Development Bank's Fashionomics Africa initiative and the African Circular Economy Alliance (ACEA) have established their platform as a single digital library for the existing initiatives, tools, websites, hubs, and resources on for the textile and garment industry.

A3.1 National Baseline Scenario

The following baseline presents national situations on the textile and garment sector, its chemicals use and waste management practices; and on national government policy, regulation and enforcement including data and information sharing on key chemicals issues.

Each country has some level of written policy on the production, supply and use of industrial POPs according to the Stockholm Convention. However, environmental regulations do not explicitly list specific POPs (PFOS PFOA, HBCD decaBDE, SCCP, etc.). Pesticides and herbicides listed under the Stockholm Convention are the main focus of the policies in these countries and is beyond the scope of this project.

An overarching theme across the countries is that they all appear to lack in harmonized, credible, and adequately funded enforcement programs. Policies without the oversight of enforcement are ineffective. However, in the three project countries at the national level, governments and stakeholders have initiated efforts to better manage the health and environmental impacts of chemicals used in the textile and garment sector.

All countries have insufficient POPs/chemical regulations and none of the countries? textile and garment regulations includes CoCs or banning industrial POPs. Furthermore, POPs and CoCs are often not included in wastewater regulations, nor are they monitored. Finally, only a few ILO conventions on equal opportunity and no ILO conventions on OSH are covered, and other Occupational Health and Safety (OHS) regulations are only partly covered in the project countries.

Free trade agreements in the region can also represent drivers for improving environmental and social standards. In 2000, the African Growth Opportunity Act (AGOA) was approved by U.S. congress, it is a preferential trade agreement to facilitate exports from African countries to the United States through duty-free entrance of certain products into the United States including textiles. Most African countries enjoy duty-free and quota-free access to the EU market. This is either thanks to the Economic Partnership Agreements (EPAs) or the Everything-But-Arms (EBA) scheme. This provide the opportunity to enhance the continent textile and garment sectors? competitiveness. They also come with some challenges for the African garment and textile companies. Many lack raw materials, advanced technology, human resources, and the capital for investment in production of these raw materials and auxiliary materials, and the technology level in the textile and dyeing industry is generally considered lower than in other countries in the other region, leading to inadequate capacity in global value chains[5]. Compliance with the free trade agreements (FTAs) in terms of working environment and labour will be challenging. The principal obstacles African enterprises face when implementing chemical management are the lack of information on quantity, quality, and the characteristics of toxic levels of their used chemicals, dealing with unlabelled chemicals, limited financial and human resources, unregulated management of documentation and information systems and not prioritizing chemical management.

Occupational health and safety initiatives focusing on chemical use and exposure have also been initiated by governments and the International Labour Organization (ILO), including through their Better Work programme (in Ethiopia, Egypt and Madagascar in Africa). The sector has experienced serious incidents and worker safety campaigns, including on women workers? conditions.

A notable feature of stakeholders in the textile value chain is the large number of small and medium sized enterprises (SMEs) that carry out the activities. These include small-scale cotton farmers, fibre, yarn, and fabric producers, dyeing and finishing facilities, apparel manufacturers and recyclers. The high proportion of groups such as women and rural migrants, often marginalized in formal employment or typically employed in the informal sector in some production regions, is a particular feature of the workforce in these value chain activities.[6]

Most of the companies visited were relatively unaware of their own waste management practices. Offcuts from the textile industry is dumped and treated as waste. These offcuts come from newly purchased cloth and are of good quality

The following sections describe the project country?s baselines.

A3.2.1 Lesotho

The textile industry is the largest formal private sector employer in Lesotho and employs around 46,600 workers. Passing of African Growth and Opportunity Act (AGOA) duty-free legislation in 2000 aided the garment industry?s growth tremendously. In 2000, fewer than 15,000 workers were employed by this industry, while, by the end of 2003, the industry peaked at around 54,000 workers. This was prior to phasing out Multi-Fibre Arrangement (MFA) as well as the 2008 economic crisis, which caused the industry decline to its current employment capacity of 46,600 workers. Even at its reduced size, this industry still directly and indirectly benefits around 13% of Lesotho?s population, also linking to various upstream and downstream economic opportunities. [1]

A typical value chain for a textile sector is shown in Figure 6 with the main sub-industries in the Lesotho context shown in green and blue. Garment manufacturing is the larger industry in terms of number of firms and employment. In the textile production industry, only one firm exists, namely Formosa, which is a relatively large textile producer.

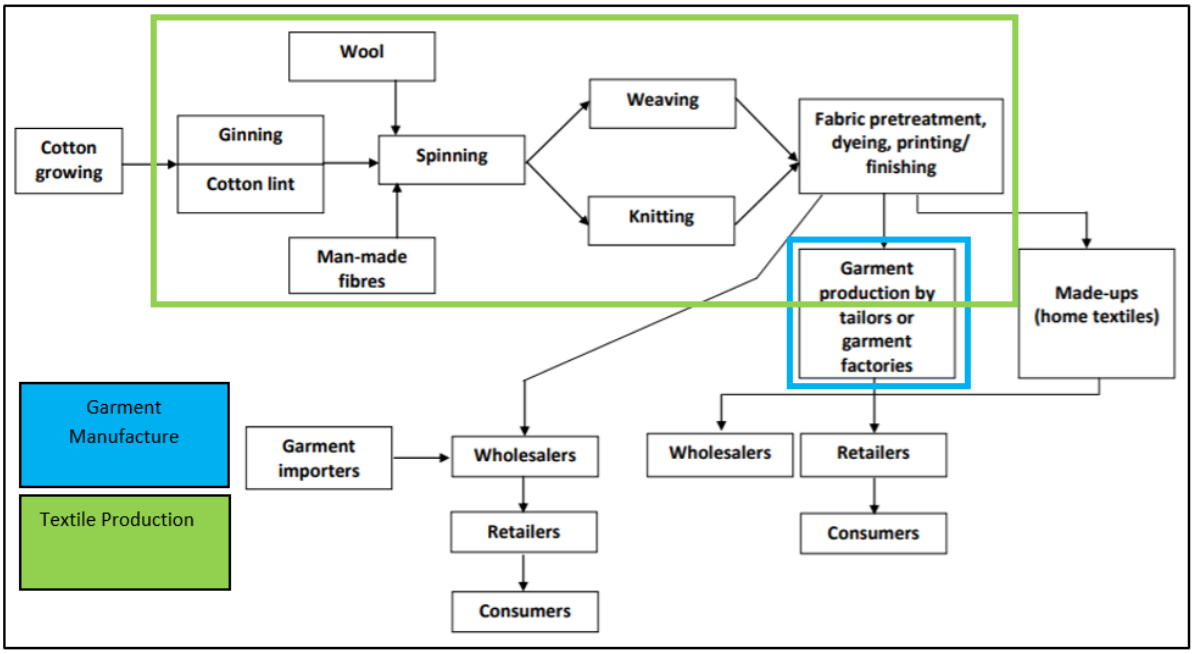


Figure 6: TG sector typical value chain in Lesotho[1]

Lesotho is traditionally known as a volume manufacturer of jeans and T-shirts. Over the past five years, Lesotho garment manufacturers have widened the range of products they produce on a regular basis to include more complicated sewing and finishes. Some firms have also added the ability to complete shorter runs for smaller orders. The current baseline for the textile industry is shown inTable 2.

Table 2: Lesotho textile industry baseline[1]

Industry	Firms	Jobs	Approximate Units of Basic Garments per Annum
Textile	1	1 220	Yarn: 18,000 ton Fabric: 15.6M. linear meters
Denim (woven)	9	13 124	23 304 000
Non-denim Woven Fashion	4	1 580	6 360 000
Industrial Workwear	6	4 696	11 003 800
Knit Garments	33	24 513	115 143 600
Footwear	2	1 253	7 200 000
Supporting Industry	11	218	-
Total	**66**	**46 604**	**155 811 400 (typical clothing units)** **7 200 000 (typical pairs of shoes)**

In order to show the spread of textile industry firms in Lesotho, a mapping exercise was undertaken and is shown in Figure **7** below.

City	Firms	Jobs
Maputsoe	9	2 459
Nyenye	14	11 042
Tikoe	9	4 489
Lower Thetsane	17	20 370
Maseru	16	8 106
Matsieng	1	120

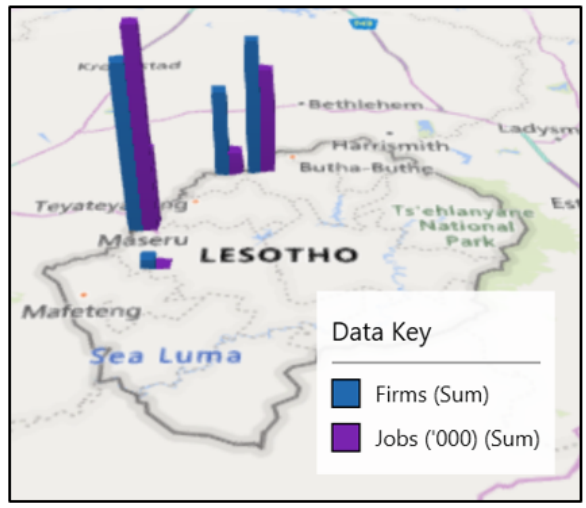


Figure 7: Lesotho textile industry mapping (right) with key (left)

In terms of local working conditions, Lesotho has good labor laws, including no child or forced labor; non-discrimination; freedom of association, regulated maximum working hours of 45 hours/week and 11 hours overtime and guarantee minimum paid leave. Lesotho is known for having competitive wages ($100-120 / month), but low productivity and high cost of utilities:

? Water & sewage: Base of $28, with $1.12 /m3

? Electricity: $21 and $0.20/kWh (low voltage, < 25kVA)

? Lesotho?s garment industry consumes approximately 20,000 MT of knit fabrics /annum.

? The only company with spinning facilities is Formosa Textiles.

Lesotho?s garment manufacturing industry is one of its largest industries. Examples of garment manufacturing firms visited in Lesotho during PPG include Hippo Knitting, Precious Garments, Global Garments, TZICC Clothing Manufacturers and LEO Garments. Most of Lesotho?s garment manufacturing firms are located in the Maseru and Maputsoe areas. Typical main activities undertaken by garment manufacturing facilities are shown in Figure 8

Figure 8: Garment manufacturing main processing steps

The garment manufacturing industry is further subdivided by type, including:

? Denim jeans manufacturing

The jeans manufacturing sector in Lesotho is made up of about 9 companies and produce around 23.3 million pairs of typical jeans per annum (Table 2). The largest fraction of this industry is owned by Nien Hsing group (three garment factories). This same group also owns Formosa (textile manufacturing plant).

Of the produced jeans, about >98% is exported to Northern America (mostly to the USA). Brands represented by the jeans manufacturing industry in Lesotho include, for example:

? Levis Strauss,

? VF Corporation (Lee and Wrangler)

? The Children?s Place (two of the plants are accredited Gap Inc. suppliers)

Furthermore, CGM group (two manufacturing plants) export jeans to South Africa. For most of the South African orientated plants, wet finishing is not undertaken in Lesotho since there are no publicly accessible effluent treatment plants that can reprocess denim water wastes. From time to time some of these plants also make limited volumes of cargo pants, chinos and industrial workwear.[97]

? Woven garments manufacturing

Four manufacturing facilities exist in Lesotho that produce woven garments outside the field of denim jeans or workwear. All these plants export mostly to South Africa. The products include higher end garments for premium apparel retailers as well as school clothing. Approximately 6.3 million clothing units are produced by this industry subgroup per annum.

? Knit garments manufacturing

The knit garments manufacturing industry is the largest subgroup of the garment production industry in Lesotho. This subgroup includes 33 firms that produce a diverse range of products, from cotton t-shirts, dresses, tracksuits, through to sportswear.

Of the 33 firms, 12 firms are focused on supplying the South African marketplace, mainly Durban and Cape Town. The remaining 21 firms supply the e United State marketplace. These orders are generally secured via sourcing agents based in the east (mainly Taiwan).

This subgroup of the garment production industry has also experienced a significant shift in the past 5 years. Where, traditionally, cotton knit garments were produced for export to the USA, many firms have recently shifted to making commodity garments whose fabrics are mainly composed of man-made fabrics (i.e. chief value synthetic ? ?CVS?). US Most Favoured Nation (MFN) customs duties of between 25-35%; as opposed to cotton commodity type garments whose US MFN duties are much lower.

? Industrial workwear manufacturing

The industrial workwear industry in Lesotho is made up of six firms that produce around 11 million units of workwear per annum. The workwear produced in Lesotho is typically used by workers in the mining, agricultural and manufacturing, and some retail operations. Most of the firms supply the South African market. The largest manufacturer in this subgroup is Jonsson Manufacturing who employ 2 800 people and supplies to South Africa as well as numerous other destinations within Southern and Eastern Africa as well as Australia.

? Footwear manufacturing

Two footwear manufacturers make up the footwear industry subgroup, which produce around 7.2 million pairs of shoes a year. Jaguar Shoes (formally ?Springfield Footwear? used to make branded pool sandals for Puma ? until Puma decided to exit this market niche) is now establishing itself with other retailers and scaling up production.

Waste statistics

According to the Lesotho National Profile, 2010 the following waste generation statistic are available:

Solid waste generation increased from 10,576 tons in 1999 to 14,973 on 2005. The population increased from 270,071 to 382,342. The population increase and therefore waste generation increase was assumed to be 7.4% per annum. Textiles are included as part of this number. This study also stated that there are no records of waste volumes generated by industries.

Waste streams generated by textile factories (LNDC, 2005) are sludge, blasting sand, pumice stone and ash. The report indicated there is no monitoring of POPs, and no local laboratories can analyze these chemicals. Textile and leather dying industries were identified as industries generating POPs. Only this industry and incinerators were found to generate POPs.

Thamae (2020) found that combined factories in his study area (Maputsoe, Leribe) produced 143,243 kg/month. Of that 60,000 kg is natural (cotton), 40,000 kg is natural-synthetic, 35,000 kg is synthetic (mainly polyester). The industry produces both liquid (that is wastewater from dyeing and washing processes) (Hapazari et.al. 2015), and solid wastes. The solids are mainly sludge, blasting-sand pumice stones. Most of large-scale textile industries are situated in Maseru, they are said to be more than six of them, with a typical textile manufacturing plant generating approximately 960 m^3 of wastewater per day. The single denim mill in the country produces about 1.4 tonnes of solid waste per day. A waste survey by LNDC (2005), pegged the amount of solid waste generated by textile industry in Maseru alone at about 11,673 tonnes per annum ? with composition breakdown of 2,073 tonnes (17.8%) sludge, 3,000 tonnes (25.7%) blasting sand, and 6,600 tonnes (56.5%) pumice stones. The study also observed that the primary residual wastes produced by the textile industry, which include fabric and yarn scrap, off-spec yarn and fabric and packaging waste, are generally non-hazardous. It was further observed that while waste such as fabric off-cuts were being put to good uses, including acting as fire-boiler sources of energy for steam generation, most of the waste was disposed in dumpsites. A subsequent, 2006, study by the same institution estimated the annual waste generation by the industry at about 13,200 ton/year. This indicates an increase in annual waste generated by the industry of about 13%, which is in tandem with the observable growth of the industry in the city and the country in general. Municipal and other waste is taken to the Municipal site in Maseru.

According to research and interviews with several waste collectors and recyclers and data from the visited TG companies, the estimated quantity of textile offcuts generated by the sector in Lesotho is about 16,800 tonnes. According to the same sources, a maximum of 20% of textile offcuts are either recycled locally producing some products such insulation material and mops, up cycled into ?raw cotton? to be reused in a local fabric firm or sent to South Africa for recycling. The other 80% is either burned, incinerated or dumped in landfills causing relevant environmental and health impacts. In some TG companies it is common practice to use textile offcuts as fuel in boilers as stated in the UNIDO project report of 2018 ?Promotion of BAT and BEP to reduce uPOPs releases from waste open burning in Lesotho? and as observed on the field during the PIF development. According to the same project, the approximate quantity of textile offcuts generated is at least 8,733 tonnes per year, taking into account that data from major generators of textile offcuts and cotton waste is missing. The estimated quantity of textile and garment waste that could be burned or incinerated is at least 1,000 tonnes per year.

Municipal and other waste is taken to the Municipal site in Maseru. There is no hazardous site in Lesotho. The landfill site was not visited but the information provided suggests that the site is poorly run with open burning taking place.

A3.2.1 Madagascar

The textile and garment industry first took off in 1989, and today includes more than 100 foreign-owned and local firms employing more than 150,000 people (EDBM, 2017). From 2015 to 2016, for example, there was a 12% increase in textile and apparel exports with a total export of USD 645 million. Most of the textiles and clothing are exported to Europe with almost 69% of the total and 18% exports to the USA under AGOA, being the top 5 importers the EU, USA, South Africa, UK and Canada (EDBM, 2017).

Since the beginning of 2021 and until July 2021, among the 16 major African countries exporting goods to the US, Madagascar ranks 7th in monetary volume of exports. The garments and hosiery exported from Madagascar are mainly destined for Germany (33.2%), France (7.5%), Spain (4.7%) and the Netherlands (3.3%), among others. The textile and clothing industry, which is mainly export-oriented, is essential for the Malagasy economy. 76.7 per cent of these exporting garment companies are registered as free trade companies. It is estimated that these free enterprises employ over 110,000 temporary and permanent workers, 71 per cent of whom are women.
In its environmental charter, Madagascar recognizes the environment as a key component of the nation's heritage and is therefore the basis for the sustainable generation of economic and social well-being. The country has ratified major international commitments that allow it to be aware of developments in the global environmental context. Also, the country is a State party to international conventions on chemicals and hazardous waste, including the Basle Convention, the Stockholm Convention and the Rotterdam Convention. Madagascar has an institutional management framework and fairly complete regulatory texts that allow the implementation of these conventions. However, improvements on these regulatory frameworks are recommended considering the evolution of the context: unintentional production of POPs, standards of atmospheric discharges, procedures and parameters of measurements of industrial discharges, provisions on industrial sludge and national standards on soil quality parameters. For the circular economy, there is an urgent need to enrich national texts to enable the promotion of the circular economy (taxation and other incentive texts). Madagascar through the Law No. 90-033 of 21 December 1990 on the Malagasy Environment Charter and the new Decree 2018-1145 of October 18, 2018 which bans the import and regulates the export of waste, hazardous waste, dangerous substances and materials containing them in Madagascar, seeks full compliance with application of the Stockholm Convention and Rotterdam Convention. There is limited information on POPs and New POPs possible import and use in the country, having no specific legislation, which regulates New POPs. Existing laws might not be enough and enforcement is very limited to address the management of POPs and hazardous chemicals and the Stockholm Convention and related conventions requirements.

Related to the TG sector, the New POP PFOS (perfluorooctane sulfonic acid) have been considered and inventoried under the NIP Update 2017. According to NIP 2017 survey of textile chemical suppliers, since 2008 to 2010, 70,000 Liters of product containing PFOS that improves the quality of stain and stain fabrics called Oleophobol C, were sold to a fabric manufacturer for product export. According to this source, the fabric manufacturer continues manufacturing this fabric but with another fluorocarbon product brand other than oleophobol, but with no specific further information. No information is available from other TG companies that might be using any POPs at the moment. The NIP 2017 plans for the development of awareness activities for the textile and garment sector as possible importers and users of PFOS, holders and exporters of PFOS-containing materials (clothing industry, carpets, etc.) as well as relevant authorities, with the objective of reducing the release and finally preventing the use PFOS. In addition, the NIP plans for implementing an exhaustive inventory of articles and products possibly containing PFOS and related substances as well as its environmentally sound management and final disposal. According to POP inventories conducted in 2015 in Madagascar, dioxins and furans emissions are occurring and increasing under particular combustion conditions in all sectors including the incineration of waste and uncontrolled combustion processes of burning household waste. This situation is due to the lack of adequate infrastructure and increase in population.

Related to BAT and BEP, there is no specific legislation promoting BAT and BEP in the textile sector. However, BAT/ BEP principles are a main strategic objective of the NIP for the implementation of the SC in Madagascar (page 14 of NIP, on National Priorities and National objectives on POPs management). The Textile and Garment sector is one of the priority sectors identified in the industrial policy of Madagascar and one of the priority lines set in the NIP to reduce POPs impact on human health and environment, in particular the possible PFOS import and use in textiles.

There is a lack of formal and accurate data on wastes generated by the sector and their disposal. According to research and interviews with several stakeholders and data from companies, the estimated quantity of textile and garment waste (cotton and offcuts) generated by the sector in Madagascar is quite large and about 10,000 tonnes per year. A small fraction of textile offcuts are either reused or

recycled, larger quantities are incinerated in some companies, this being a common practice in the sector according to the project report ?Promotion of BAT and BEP to reduce uPOPs releases from waste open burning. Assessment of the cotton, textile garment sector of Madagascar? was undertaken and field observations made during the PIF development visits. The largest quantity of textile and garment waste is sent to landfills and sometimes burned there. Some of these textiles are used in households as fuel, therefore, burned causing serious health problems and environmental pollution including uPOPs. The estimated quantity of cotton, textile and garment waste that could be burned or incinerated according to this project data and field observations could be as high as 7,000 tons per year. No existing textile and garment reuse and recycling facilities and infrastructure are currently available in Madagascar.

Data collection from the PPG assessment studies in 8 textile companies, garments producers from fabrics or from the recycling of scraps from other textile companies. Only 3 of these companies were involved as pilot sites in this project: Epsilon, Tropic Mad (a subsidiary of Tropic Knits) and Aquarelle. The latter two belong to the CIEL Group.

All the factories visited use chemical inputs in their production process as well as in the treatment of industrial water. The stages that consume the most chemicals considered to be hazardous are washing, dyeing and screen printing, where corrosive or irritating materials are used; POPs chemicals are considered to be a "Use ban". To this end, a sourcing procedure is in place to avoid the purchase of these products. The industries are audited monthly with regard to their storage and use of these products.

The generation and treatment of waste is as follows:

? **For fabric scraps:** 87% to 100% of scraps are recycled at Epsilon and Aquarelles, while for Tropic Mad, only 25% of scraps are recycled and the rest is fed into the company's boiler. These industries minimize these fabric scraps by applying advanced technologies in their pattern making department. For recycling, the scraps are fed to the craft sector where they are sorted, sold or given to local entrepreneurs who then resell them. Local artisans produce pillows, cushions and walking mats. Also, as part of the company's CSR policy, Epsilon has created a unit to transform these scraps into blankets to be donated to charity. On the other hand, only one industrial-scale company, SOMACOU, is present in Madagascar and is able to transform these fabrics into cushions, pillows, blankets and household linen by "upcycling".

? **Industrial wastewater**: Wastewater effluents come from the wet operations that are carried out during the various stages of the textile manufacturing process (yarn coloring, washing, dyeing, etc.). Depending on the type of products produced by the companies, the total volume of wastewater discharges varies from 45 -125,4 m^3/month. Analyses of industrial water downstream of the treatment ponds are carried out according to Malagasy regulations (Epsilon) and according to ZDHC parameters (Tropic Mad, Aquarelles). In

general, the treated raw wastewater complies with the ranges of values recommended by the regulation:

Table 3: wastewater standards and values

Parameters	Malagasy standard	Aquarelle	Tropic Mad	Epsilon
Ph	6,00- 9,00	6,9	7,38	7,1
Conductivity	2000	1190	NC	1100
TSS (mg per liter)	60	51	NC	10
Dissolved oxygen (mg oxygen per lite)	NC	NC	NC	2,6
COD (mg oxygen per liter)	150	96	30	20
BOD (mg oxygen per liter)	50	39,7	8,3	10
NO3 (mg per liter)	20	0,4		0,18
Total nitrogen (mg per liter)	20	NC	41	NC
Ammoniacal nitrogen (mg per liter)	15	NC	34	NC
PO4 (mg per liter)	10	NC	NC	0,08
Copper (mg per liter)	0,2	<0,01	<0,01	0,01
Chromium (mg per liter)	0,2	<0,01	<0,01	<0,027

? **Sludge from the treatment ponds**: within the pilot companies, the sludge from the WWTPs is either treated by specialized organizations, 100% of the sludge from Tropic Mad and Aquarelle is treated by ADONIS; or transformed into briquettes for the boiler. The latter are rich in iron and made from a mixture of sludge, cardboard waste and chips (Epsilon). For other textile companies studied, they are buried or used as fill. The dangerousness of this practice is subject to questioning, particularly with regard to the impact on the water table.

? **Metal waste and scrap metal:** Industries generate a significant amount of scrap metal that is sold or reused internally: 1.4-3.2 tonnes/year. However, in accordance with current legislation, the purchase and sale of ferrous products: scrap metal of any kind, aluminum waste and scrap, copper waste and scrap, are prohibited. On the other hand, companies can send their goods with one-off and exceptional authorizations

? **Electronic and electrical waste:** The quantity of this type of waste varies from company to company. For the only company for which data is available, a quantity of 4.16 tons/month of electronic and electrical waste is generated. The waste is stored in a room specially dedicated to waste electrical and electronic equipment. Whenever possible, it is donated or sold and collected by approved service providers for recycling or reuse. Generally speaking, the most dangerous waste (batteries, electric and neon lamps) is

collected by specialized organizations (ECOLOGIC), while a large part is sold at auction (computers at the end of their life).

? **Plastic waste:** After textile scraps, plastic packaging represents a significant volume of waste in the textile industries. Plastic packaging and cones are sorted and packaged:

i. The waste plastics are sent to SMTP, which is a plastics and polymers processing and recycling company.

ii. Returned to suppliers (in the case of cones), who are abroad in the case of Tropic Mad

iii. Purchased by individuals. However, one of the major concerns of companies is the frequent abandonment of plastic packaging in nature which is an environmental concern as it affects people and the planet in general. Indeed, monitoring the use of plastics by these purchasers is beyond the competence of companies, who rely on the simple commitments of the latter.

iv. Granted (donation) to charities

? **Cardboard and paper waste:** The cardboard and paper waste used for packaging or rolls is to a large extent incinerated or burned in boilers. A small part (23%) is sold or given to individuals to be recycled (Tropic Mad case). However, experiments to make briquettes to start boilers are currently underway within companies. In general, companies, depending on the type of order, generate 0.26 to 6.9 tonnes/month of cardboard and paper waste.

A3.2.2 South Africa

The clothing and textile industry lies within the clothing, textiles, footwear and leather (CTFL) sector. These industries are concentrated in two provinces: KwaZulu- Natal and Western Cape (CCTC, 2017) The industry has contracted since the opening of South Africa?s economy in 1990, primarily due to an influx of cheaper imported products. China remains the major supplier of textiles to South Africa. China is South Africa?s number one trade partner with total export sales approximating US$6.8 billion in 2016 and total imports of US$13.5 billion the same year[1]. The Chinese textile industry counts among the fast-growing industries in China. Its total output was 3.25 trillion RMB (531.6 billion USD) in 2014, representing approximately 57% of the world?s textile industry total output, making China the largest exporter of textile products.[2] There is also very little verification of the textiles that are imported from China regarding chemical composition and makeup, specifically the chemicals and dyes that are used to produce these fabrics and garments. In 2020, South Africa?s total imports were 54,957 tons of fibre, 43,894 tons of yarn, 142,779 tons of fabric and 270,000 tons of garments[3].

South Africa has sufficient production capacity available locally and the drop in production has been attributed to the cheap imported products. Textile factories were only operating at about 66% of capacity and clothing factories were operating at 76% of capacity during 2017. Its contribution to the Balance of Payments (given an average duty of 10.5 per cent) is approximately R1-billion annually. The local textile industry represents approximately 1 % of the GDP for South Africa and the country currently consumes less than one per cent of the world?s textile fibres. Employment in the manufacturing industry represents approximately 12% of total employment in South Africa, with textiles and clothing representing approximately 6% of total manufacturing.

The textile and garment sector in South Africa is predominately found in the two provinces of Western Cape and Kwazulu Natal. There is insufficient literature on the amount of textile and clothing manufacturing and export but a study that comes close to giving insight on the topic is one that was undertaken by the Potchefstroom University in 2004 showed that of the 98 textile manufacturers surveyed, 35 percent of these practiced recycling of fibre, yarn and fabric off cuts. Very little information on fabric recycling in South Africa is published and it is difficult to obtain information on this practice. However, the available literature and the field visits and discussions with the players in the industry puts the amounts of textile and garment waste generated at various stages on the life cycle. According to a study in 2019, about 3500 -3700 tons of textile waste is collected for recycling in South Africa locally and a further 1500 tons per month of textile waste was imported from Eswatini, Mauritius and Madagascar. The fluctuation in the amount of textile waste used in recycling is consistent with results found internationally.

In the early 2000s, the country embarked on ensuring national policy documents were aligned with international agreements which included the initial Sustainable Development Goals at the WSSD in 2002. These were based on the Agenda 21 goals and national targets were put in place for the industry to meet.

The National Department of Environmental Affairs[4] is in charge of promulgating sustainable development policies in line with national and international goals and the most recent sustainability framework being adopted is the global SDGs. A few policies which encourage the uptake of sustainable mechanisms include the National Environmental Management Act, National Framework for Sustainable Development, Green Economy White Paper, and the National Strategy for Sustainable Development and Action Plan. From these, the legislation enforces regulations that include all environmental thematic resource areas (energy, water, waste, raw materials).

The Department of Trade, Industry and Competition has also spearheaded programmes known as the Industrial Policy Action Plan (IPAP), in which the textile industry features as a key priority sector. Parallel to this, programmes promoting green industries and the growth of the green economy combined with local sustainable textile value chain development are also being implemented (specifically the 2030 Retail, Textiles, Clothing, Leather and Footwear Masterplan).

South Africa is a party to various multilateral environmental agreements including the Stockholm, Rotterdam and Basel Conventions, which deal with hazardous waste and chemicals management. The policy, regulatory and institutional framework used to address the management of chemicals and waste in South Africa in anchored in various pieces of legislation and government departments. Generally, these policy and regulatory framework falls under the Departments of Environment, Agriculture, Water, Health, Labor and Trade and Industry. The Department of Environment, Forestry and Fisheries (DEFF) has given notice of its intention to Phase-out the use of Persistent Organic Pollutants, through regulations (GN 744 in GG 41790 of 24 July 2018) under section 44(1) (a) read with section 47 of the National Environmental Management Act 107 of 1998. The proposed Regulations includes notification, development of phase-out plans and reporting duties that will be imposed on users, producers, distributors, importers or exporters of listed chemicals. The TG sector has been identified as a priority for the reduction of POPs emissions from open burning operation in accordance with the National Implementation Plan (NIP) of the Stockholm Convention (SC) on POPs, 2012, and the National Implementation Plan (NIP) Update of the Stockholm Convention on Persistent Organic Pollutants (POPs), 2020. POPs and PFAS do not seem to be to be a major influencer on the South African Textile Industry, mainly because they are not looked for in the imported raw materials, fabrics and garments. With the South African Textile Industry using more than 96% imported materials, this will be the major source of these chemicals into the industry, and currently it is going unnoticed.

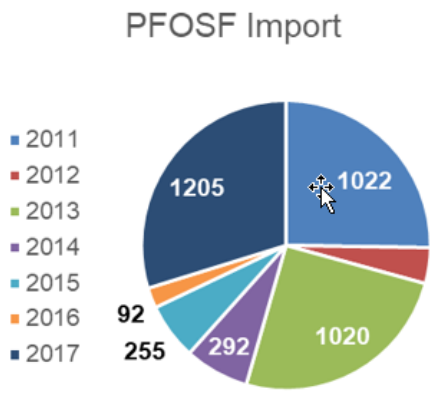
The following are the POPs of concern in South Africa:

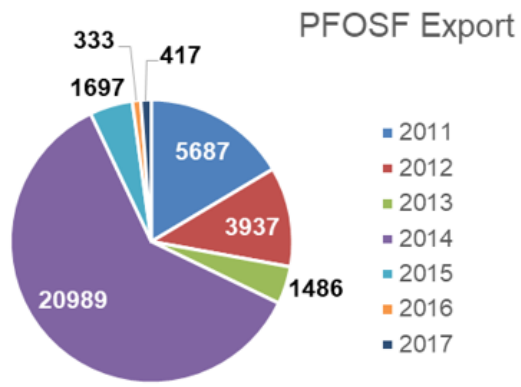
- Decabromodiphenyl ether is listed in Annex A with various specific exemptions. Decabromodiphenyl ether (also known as decaBDE, DBDE, decabromodiphenyl oxide, DBDPO, or bis (pentabromophenyl) ether) is a brominated flame retardant used to protect

many products and materials from the risk of fire, including electronic equipment, furniture cushions, upholstery textiles, carpet backings, mattresses, vehicles, aircrafts and building materials (Posner, 2004). There is no evidence regarding import and export data of Decabromodiphenyl ether (Commercial mixture, cDecaBDE) in South Africa.

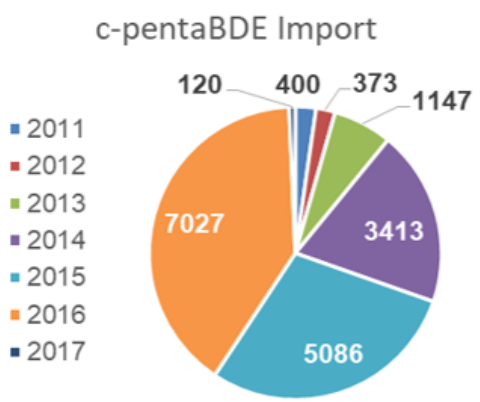
- Hexabromobiphenyl is listed in Annex A without specific exemptions and belongs to the group of polybrominated biphenyls, which are brominated hydrocarbons formed by substituting hydrogen with bromine in biphenyl. Hexabromobiphenyl was used as a fire retardant in three main commercial products. There is no evidence of import and export for Hexabromobiphenyl between 2011 and 2017.

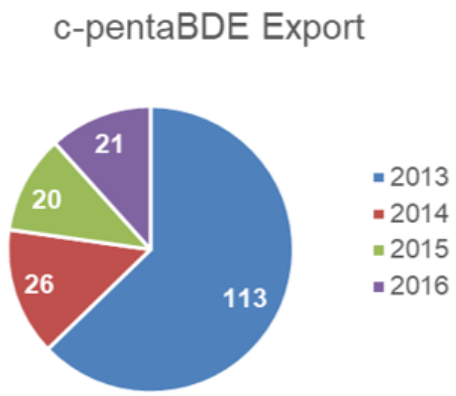
- Import and Export of Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF). The graphs below represent the import and export quantities (kg) of Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) obtained from the DTI Trade Statistics and the ITC website using the SARS Tariff code and the HS Code.





- Tetrabromodiphenyl ether and pentabromodiphenyl ether are listed in Annex A with specific exemptions for use (recycling articles that contain these chemicals). Tetrabromodiphenyl ether and pentabromodiphenyl ether are the main components of commercial pentabromodiphenyl ether (C-pentaBDE). The graphs below represent the import and export quantities (kg) of Tetrabromodiphenyl ether and Pentabromodiphenyl ether (c-pentaBDE) obtained from the DTI Trade Statistics and the ITC website using the SARS Tarrif code and the HS Code.





There is little or no manufacturing of flame-retardants. Therefore, most of the flame-retardants used in the country are imported. The largest source of the POPs flame-retardants results from the imports of fully manufactured products such as textiles, foams and electronics that have been treated with flame-retardants.

There are currently two companies that deal with the treatment, destruction and disposal of waste. Both the companies have hazardous waste license sites in Gauteng province. A-Thermal Retort Technologies (Pty) Ltd is a waste management company that specializes in the thermal treatment, incineration and management of hazardous and toxic waste from the pharmaceutical and chemical manufacturing industries. The facility has a design capacity of 120 Tons of thermal destruction, currently operating at 60% of the design capacity. Enviroserv Waste Management (Pty) Ltd, the largest hazardous waste management company in South Africa, applies various types of treatment technologies for the treatment and disposal of hazardous waste including POPs wastes. Hazardous waste treatment practices include physical, chemical, immobilization and solidification.

South Africa has the capacity to ensure compliance and monitoring of the environmental legislative provisions of the country. However, there is frail enforcement of the existing legislation relevant to POPs management. There are currently no comprehensive national monitoring programmers to monitor POPs in the South African. Number of specific studies have been undertaken which monitored the levels of POPs in specific environmental media and related the results to effects on human health or impacts on the environment. However, these studies are limited and require strengthening in terms of specialized training and upgrading of infrastructure such as equipment and laboratories.

There is no legislation and a clear application of on related to BAT and BEP principles in the industry, including the textile and garment sector. International reference documents on BAT and BEP are used as reference but still at an initial stage. No subsidies and/ or incentives are available to promote BAT and BEP neither financial mechanisms to promote them in the industry, including the textile and garment sector. In the NIP Update, BAT ad BEP application are presented as a strategic tool for present and future industrial progress to attain NIP implementation and SC objectives (page 5 and 12 of NIP). The textile and garment sector is highlighted as one of the possible sources identified in the NIP to reduce POPs impact on human health and the environment, in particular on the possible PFOS import and use in textiles, since it could be found in surface protection products such as carpets and clothing.

Though there is vertical integration in a number of textile companies in South Africa, the majority of waste still go through the value chain of transportation, bailing, sorting, recycling and remanufacturing. The SME industry that utilizes the material for high end products continues to be a small contributor to the industry as its uptake of textile waste is very minimal. The importation of fabric waste into South Africa seems to play a significant role in how the textile industry functions. Evidence on the ground shows that there is very little textile waste going to the landfill in significant numbers but even then if

any such waste found itself at the landfill, it would be collected by private transporters. However, previous studies have found that 14.6 percent of pre-consumer textile waste would find itself at the landfill. In Durban, it is estimated per month 410 tons, 2400 tons, 1400 tons of wastes are landfill or burned, recycled and imported respectively, which is about 50,520 tons per year. While in Cape Town, it is estimated per week 165 tons, 182 tons, 241 tons of wastes are landfill, recycled and burned respectively, which is about 30,576 tons per year. Thus, from only these two cities the total TG wastes generated annually is about 81,096 tons.

According to the PPG study very little of the waste generated from the typical textile and garment industry firms was reused internally but was either disposed as part of the general waste or was collected directly at no cost or at a fee or by a baling/shredding company or a secondary waste collector that ultimately sold to either a baling/shredding company or a recycler. A typical quantity would be disposed at the landfill, but this amount would still be collected by bailing companies from the landfill to be sold for recycling.

An analysis of South African Municipal waste steam was undertaken in 2017 by Circular-Vision. The study looked at the three tiers of municipalities and specifically included textile waste as a percentage makeup of the landfill wastes associated with the three types of municipalities. Metropolitan (or category A) municipalities govern large densely urbanised regions that encompass multiple centres with close economic linkages, i.e., metropolises. Metropolitan municipalities are unitary authorities responsible for all local government functions within their areas. Category B municipalities are municipalities that share municipal executive and legislative authority in its area with a category C municipality within whose area it falls[1]. Most of the textile industries in South Africa will fall within the Category A type Metropolitan Municipalities. Analysis of these landfills shows that 6.4% of the category A type landfill is made up of textiles. These textiles are though not specifically defined, but would include clothing, carpets, accessories etc.

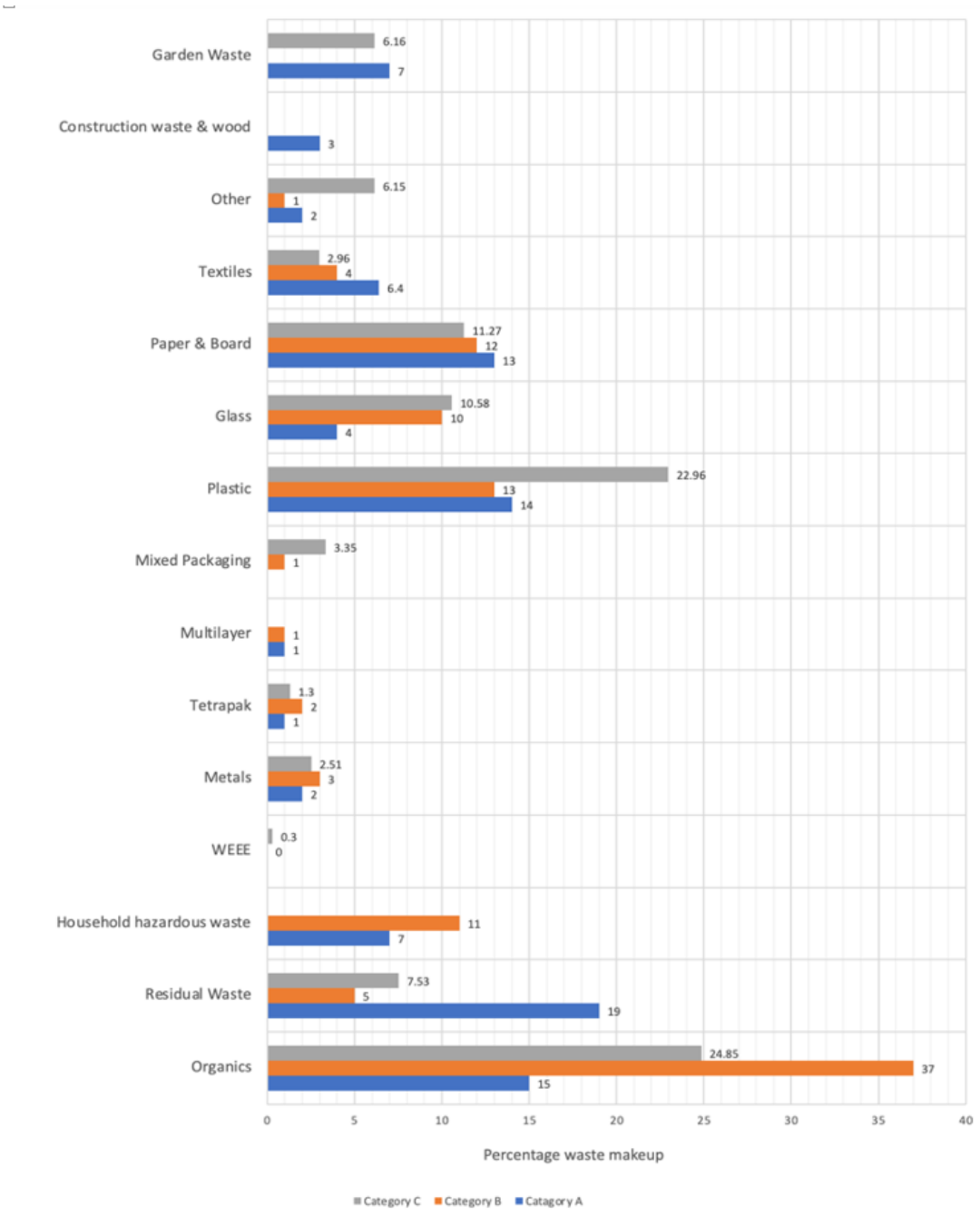


Figure 9: Percentage Waste makeup on Municipal Landfills (Category A - C) (Source: Circular-Vision)

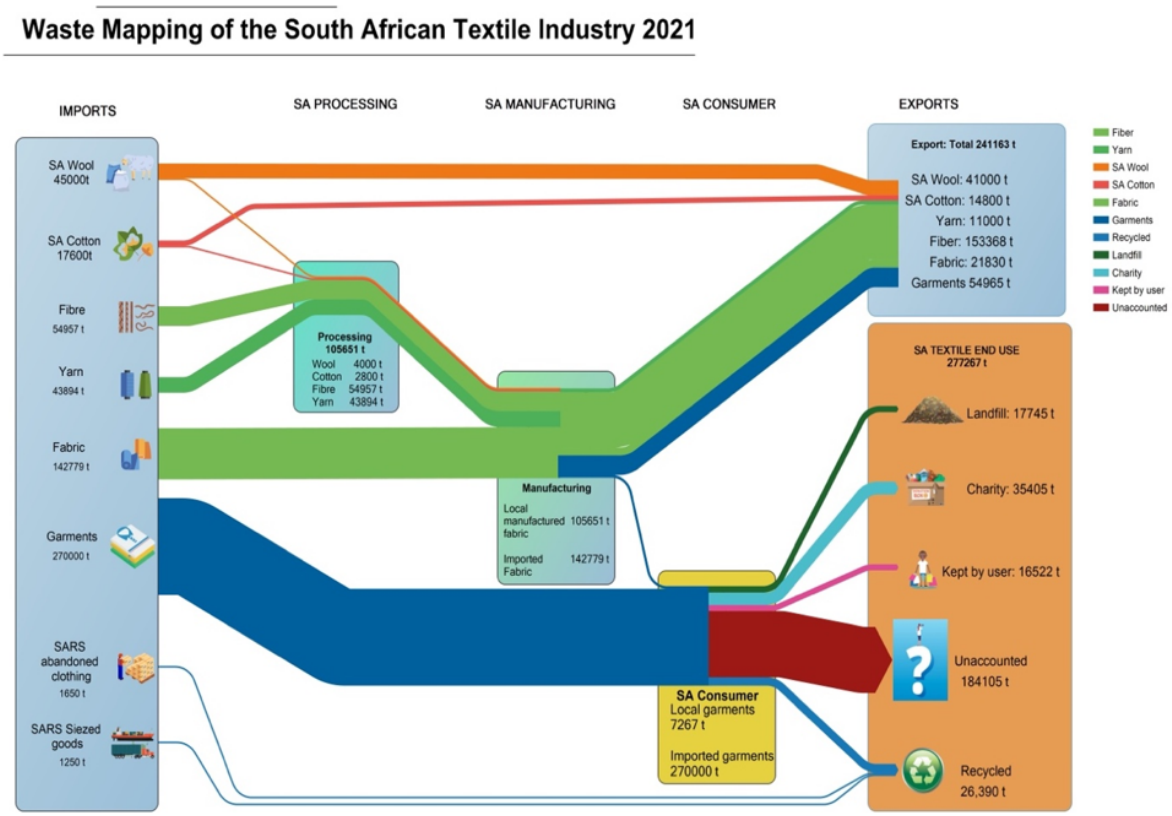


Figure 10: Waste Mapping of the South African Textile Industry (2020)

•Approximately 6.4% of textile waste ends up in South Africa?s landfills. This amounts to 17,745 Tons per year of textile waste that is being landfilled. Almost all textile waste products can be recycled into new products, such as insulation and acoustic products, underfelt, and blankets.

There are several textile recycling companies in South Africa currently performing the recycling. With the companies that were interviewed along with the SARS data on seized goods that have been recycled, almost 10% of textile waste in South Africa is currently being recycled. This figure can increase with the assistance of the South African Government and international partners with increased awareness and funding.

The South African waste management policy focuses heavily on the principle of ?prevention is better than cure? with the key policies integrating the waste management hierarchy. The concept of the waste management hierarchy indicates an order of preference for actions aimed at reducing and managing waste and at maximizing the practical benefits - ecologically and economically - of products. South Africa has one of the best legislative framework that supports recycling but the enforcement of the legislation and compliance has proven to be a challenge. Regarding training, education and awareness raising, the Department of Trade and Industry hosts the NCPC and continues to benefit from various trainings on Cleaner Production & Sustainable Consumption

The new Extended Producer Responsibility Act (EPR) is being implemented, wherein companies are required to take responsibility for the packaging waste of their products following the sale thereof. This ensures that from the production stage the producer is already putting strategies in place to minimize, reuse, recycle and recover resource materials from the product?s inception. This reduces the throw-away mindset and promotes resilience and long-term sustainability for the local waste sector.

Encouraging global standards and tackling them with a long-term view. The department of environmental affairs is spearheading circularity with policy leaders providing political will. The Department of Trade and Industry also provides a section on the Green Industry platform. The National Cleaner Production Centre South Africa has embarked on projects such as Industrial Symbiosis and Life Cycle Management to support the promotion of the circular economy.

•A3.1 Associated Baseline Projects

The following projects are underway or planned by the project partners and will support the project activities (Table **4**).

Table 4: Associated baseline projects.

Project (title, donor, duration)	**Relevant activities**
National projects	
Lesotho	
Promotion of BAT/BEP to reduce u-POPs releases from waste open burning, a project implemented by UNIDO in participating African countries of SADC sub-region. The project is being carried-out by the Department of Environment in the Ministry of Tourism, Environment, and Culture of the Government of Lesotho as Lesotho is one of the participating countries.	This current project will be implemented in close linkages with the BAT/BEP open burning project with participating African countries of SADC sub-region. With this project, resources and information will be shared to ensure synergy. Already under the open burning project, the wastes from the TG sector has been identified as priority for the reduction of uPOPs emissions from open burning operation. Under the same the project, study tour was arranged for counterparts to undertake industrial visit to TG wastes recycling facilities in Italy. This project will leverage on the capacity built and information gathered under the SADC Open Burning project.
Lesotho Highlands Water Project, including the construction of Polihali dam and generation of Hydropower at Kobong.	With this project, resources and information will be shared to ensure synergy and the possibility of using the hydropower energy in the participating facilities will be investigated.
Madagascar	
Promotion of BAT and BEP to reduce UPOPs releases from waste open burning in the participating African countries of SADC sub-region, UNIDO, 2018.	1. The project is aimed at achieving continuing minimization of unintentionally produced POPs (u-POPs) releases in the open burning sector of participating African countries of SADC region through introduction of best available techniques and best environmental practices (BAT/BEP) measures at selected priority demonstration sites, including Madagascar. This project will be implemented in close linkages with the BAT/BEP open burning project with participating African countries of SADC sub-region. With this project, resources and information will be shared to ensure synergy. Already under the under open burning project, the wastes from the TG sector has been identified as priority for the reduction of uPOPs emissions from open burning operation.

Textile City, managed by the Economic Development Board of Madagascar (EDBM) which is currently promoting a new industrial area in Moramanga (eastern side of Madagascar) of size between 100 to 600 hectares, dedicated to about 100 textile and garment facilities to operate;	This project will identify and assist relevant facilities that can facilitate the implementation of this project. The textile city will be identified as potential demonstration site for this project to take advantage of the existing facilities.
CHEMOBS in Madagascar, UNEP. The Africa ChemsObs project aims at developing an integrated guidance to build capacity necessary to set up an integrated health and environment observatory surveillance and information management system that will enable African countries to establish evidence based policies and make sustainable decisions on sound management of chemicals and related disease burdens;	Capacity and awareness raising programme focusing on capacity to identify presence and use of CoCs / POPs in chemical products. With this project, resources and information will be shared to ensure synergy
The National Fuel Ethanol Program	The program objective is to replace the use of charcoal and fuelwood by ethanol as a household fuel to protect the health of the local population. The project is being managed by the Ministry of Industry, Trade and Handicraft. The Interdepartmental Technical Committee for the fuel ethanol program has been set up and is already operational; With this project, resources and information will be shared to ensure synergy and the possibility to use the hydropower energy in the participating facilities will be investigated.
Better Work Programme by ILO	In 2020, Better Work concluded a preliminary feasibility study for Madagascar. Better Work is planning to conduct an 18-month-long pilot intervention in close collaboration with the national constituents and all other relevant actors in the garment industry. The planned intervention aims to address existing decent work deficits in the Malagasy garment sector through a two-pronged approach. One is to provide thematic services to garment factory managers and workers based on proven Better Work tools and methodologies from other countries. The second intervention will target the tripartite constituents` capacities, with the objective of strengthening their respective roles in the country?s apparel supply chain and the governance of the labor market. This will be important to ensure impact and sustainability of efforts under this time-bound intervention.
South Africa	

Minamata Initial Assessment in South Africa, a project implemented by United Nations Environment. The project is being carried-out by the Department of Environmental Affairs Fisheries and Forestry;	2. This project will support the UNIDO mandate of promoting inclusive and sustainable industrial development (ISID) and the selection of the Department of Trade and Industry (DTI) as a lead agency underscores the relevance and importance of this project to the achievement of ISID objectives. Through the greening of the industries and the creating of new green industry in the TG sector, the project will contribute to UNIDO ISID Programme in South Africa. UNIDO has established through previous projects the National Cleaner Production Centre (NCPC), which will be the National Executing Entity (NEE) to implement RECP, BAT/BEP techniques in the TG sector.
UNIDO?s Global Cleantech Innovation Programme (GCIP) in South Africa and PFAN	The Programme support countries to accelerate the uptake and investment in cleantech innovations (GEF ID 10461), which aim to promote coordination, ecosystems connectivity and accelerate the uptake of, and investment in, innovative cleantech solutions under the Global Cleantech Innovation Programme. This project with the support of PFAN will develop business models and financing mechanisms for sustainability of TG wastes recycling and reuse operations under output 3.3
The Partnership for Action on Green Economy (PAGE)	PAGE provides integrated and holistic support to countries on eradicating poverty, increasing jobs and social equity, strengthening livelihoods and environmental stewardship and sustaining growth. The programme is adaptive and aligns with national priorities to offer tailored and effective support to transform economies to advance the 2030 Agenda and Paris Agreement on Climate Change.

A.4 The proposed alternative scenario with a brief description of expected outcomes and components of the project

The project intervention will address the above mentioned barriers (section A2.2) by strengthening the sound management of industrial chemicals and their wastes through better control, and reduction and/or elimination in Lesotho, Madagascar and South Africa to promote Circular economy in the textile garment sector. Furthermore, the use of POPs will be prevented by promoting the environmentally sound management (ESM) of POPs and waste through the introduction of BAT/BEP measures to protect human health and the environment.

The project will promote circular economy in the textile and garment sector through the following among others:

- Product and process system design in the entire value chain for durability, multipurpose application, reusability, recyclability, maintainability and repairability; i.e. adoption of a life cycle thinking (cradle to cradle) approach.
- Adoption of low carbon and cleaner technologies through the application of resource efficient and cleaner production (RECP) tools and techniques
- Productivity improvement and waste minimization through process optimization; equipment modification and acquisition of cleaner technologies;
- Non-hazardous manufacturing and production operations for POPs and other toxic chemicals pollution prevention and control through the implementation of BAT/BEP in the textile industries and garment making industries.

- Waste recovery, reuse and recycling enhancement and improvement through avoidance of hazardous chemicals and waste in the textile and garment production process;

- Adoption of ?zero waste to landfill? business strategy in the TG value chain through waste minimization of process wastes, recycling and reuse of end-of pipe wastes with the establishment of green industries that will convert textile and garment wastes and offcuts into cotton fibre for reuse as input materials in the textile fabric making industries and downstream in the garment making industries.

- Support of the regenerative of economy through substitution of recycled natural cotton and synthetic fibre for raw cotton fibre as input resources in the textile manufacturing process; and use of renewable energy, biodegradable inputs and bio-chemicals.

- Restoration of contaminated and degraded land through reduction of wastes to landfill and by keeping materials and products in use.

As the removal of hazardous chemicals in textile production is a prerequisite for sustainable circular models, reducing and phasing out the use of hazardous chemicals in the textile sector is needed. Moreover, under Component 1, activity 1.1.6 will address the imported material (supplier), it will build capacity to test and monitor the supplies to ensure the imported fabric for garment making is POPs free. The main goal of Component 2 is to implement BAT/ BEP/ RECP methodology and Circular Economy concepts for the prevention and reduction of POPs and other hazardous chemicals and materials used in textile and garment production facilities. This will enhance the recyclability of textile fabric and its wastes that are generated upstream in the textile mills and garment making operations. The POPs free fabric from the textile mills will be used in garment production process, and recycling operations through the introduction of green product design, improved operational efficiency and sustainable municipal waste management plan as part of implementing circular economy concept under component 3. Furthermore, the implementation of RECP methodology will minimize wastes and any wastes generated will be POPs free fabric.
Some of the participating facilities have integrated facilities (fabric and garment) and the project will ensure the elimination of the use of POPs chemicals as well as the minimization of wastes through BAT/ BEP/ RECP especially in the fabric/textile facilities before they are used in the garment facilities, where circular economy concepts will be implanted for the reuse and recycling of the discards.
The project will focus primarily on ?post-industrial/pre-consumption? wastes and not on post consumption waste such as worn garment. However, based on the pilot demonstration location and the assessments results, post consumption wastes might be included. Through the development of ESM plan (output 3.1), the post-consumer can be integrated in the future. Under output 3.7, the project will link to ongoing TG waste initiatives, other TG industrial facilities wastes and municipality TG waste.
The project is partnering with local recyclers and waste management entities as well as ZDHC on CE and sustainable chemicals management.

The TG sector will be strengthened and broadened through the development of waste recovery and recycling segment of the TG value chain that will create new green industries and related services. The project will undertake a technoeconomic assessment of the circularity of the TG sector and development of viable business models and financial mechanisms for the economic viability and financial profitability of the recycling chains. The lessons learnt and experiences gained in the pilot demonstration of the circular economy concept in the TG sector will guide policy reforms and regulatory framework that will be required to promote circular economy in the TG value chain. These will be in form of green products design and standards (less material input, non-toxic, non-polluting, less material and energy consumption during use; and easily recoverable, reusable, recyclable; and with minimal negative impact on the environment after disposal), tools and methodologies for chemicals tracking; compliance monitoring and enforcement of regulations and standards; development of guidelines for an integrated textile and garment value chain; products traceability and tracking. The outcomes and results of the pilot demonstration of textile/garment wastes/offcuts will have implications for the review of existing municipal solid waste management practices; policies related to establishment of industrial

clusters and parks; and transboundary movement of wastes and used clothes and clothing. The technoeconomic assessment of the circularity of the TG sector will also identify investment capital and operating cost regimes that would enable and sustain the implementation of the circular economy concept. In addition the required fiscal and policy incentives, investment financing and promotion guidelines that would support its sustainability will have to be prepared, enacted and implemented. In order to replicate and upscale the activities of the project the requirements for regional and global networking and partnership will need to be identified and the requisite conditions for enabling and implementing it will be addressed. The knowledge management component will establish a platform that will provide the opportunity for interactive information exchange and experience sharing and facilitate the dissemination of the lessons learnt and experiences gained from the pilot demonstration with the active involvement and participation of the international brands and other global players like the Zero Discharge of Hazardous Chemicals (ZDHC).

The selection of sites for the pilot demonstration was based on the following criteria: textile and garment industries at locations with high wastes generation; industrial locations which pose high environmental pollution challenges; national government priorities and preferences to jumpstart the implementation of the circular economy concept; and industrial parks where ancillary support facilities for waste collection, separation; and transfer and transportation can be easily provided and/or upgraded. In addition, through the adoption of the value chain approach, industrial locations and sites where textile manufacturing industries and textile production share contiguous boundaries was also given consideration for ease of logistics.

The industries were identified based on size, production capacity and processes, connection to international fashion brands; willingness to participate in the project; readiness to implement recommendations for process improvement and readiness to provide requisite co-financing to complement GEF resources. Industrial facilities that large production capacities and offer opportunities and operational flexibility for process modifications; equipment retrofitting and upgrade; and ability and capacity to acquire and absorb environmentally sound technologies (ESTs) were given preference. Industries that have combined textile and garment production facilities were also identified as they offer the opportunity for an integrated business model development.

The project will have at least one-demonstration pilots in Lesotho and Madagascar, while at least 2 in South Africa. The demonstration pilots will target three stages: textile manufacturing, garment making and recycling/reuse.

The BAT/BET/RECP will be identified based on the detailed assessment after the inception of the project. The options will be derived from the BAT/BEP guidelines of Stockholm convention and from the EU Best Available Techniques (BAT) Reference Document for the Textiles Industry but also from other sources such as from the industry initiative ?Zero Discharge of Hazardous Chemicals (ZDHC)?. The latter is very important as it also considers pollutants present in textile product which is crucial for closing the loop, i.e. to re-use and recycle textiles. This requires the design of textile products in a way that the application of chemicals of concern including POPs, uPOPS and hazardous which are already identified but not regulated so far (precautionary approach). Important examples for this approach are all poly- and perfluorinated compounds whether with a carbon chain of four up to 10 carbon atoms, other than PFOS and PFOA. The same is true for brominated and chlorinated flame retardants, biocides, and water or oil repellents.

UNIDO RECP methodology will be used for resource conservation and waste minimization, usage for renewable energy and water management. Developing improvements based on the RECP methodology follows the logical approach of assessment, root cause analyses and option generation. Feasibility studies of the options are performed to include technical feasibility, economic and environmental and social sustainability. Apart from technical and financial decision criteria also several more or less intangible criteria are used such as improved image, corporate social responsibility; compliance with

transparency and traceability requirements, green product development, and improved relationship with national and international stakeholders and liability issues. Barriers which may hamper implementation can be the lack of finance, time and space constraints, lack of capability to absorb the new technologies and processes.

The project will establish regional cooperation and network for information exchange and experience sharing as well as regional and interregional knowledge management. Specifically, the project will be implemented with close linkage with UNEP regional textile project in Asia.

The project will build strong partnerships with various relevant stakeholders to address such root causes under the COVID-19 outbreak. The project has enlisted the involvement and collaboration of partners in the knowledge management and global value chains such as ZDHC, Cambridge University Circular Economy Centre; Sustainable Fashion Academy and the international fashion brands, which will bring their expertise, knowledge and competencies to ensure that the requisite resilience is built into the project to be able to achieve the envisioned global environment benefits. This intervention aims at bringing about convergence, coordination and broader adoption of these initiatives in order to generate a durable change in the TG sector. If all the assumptions made are in place, this transformational change is expected to occur at all levels: social, economic, environmental and governmental, as shown in the theory of change (TOC, see Figure **11**).

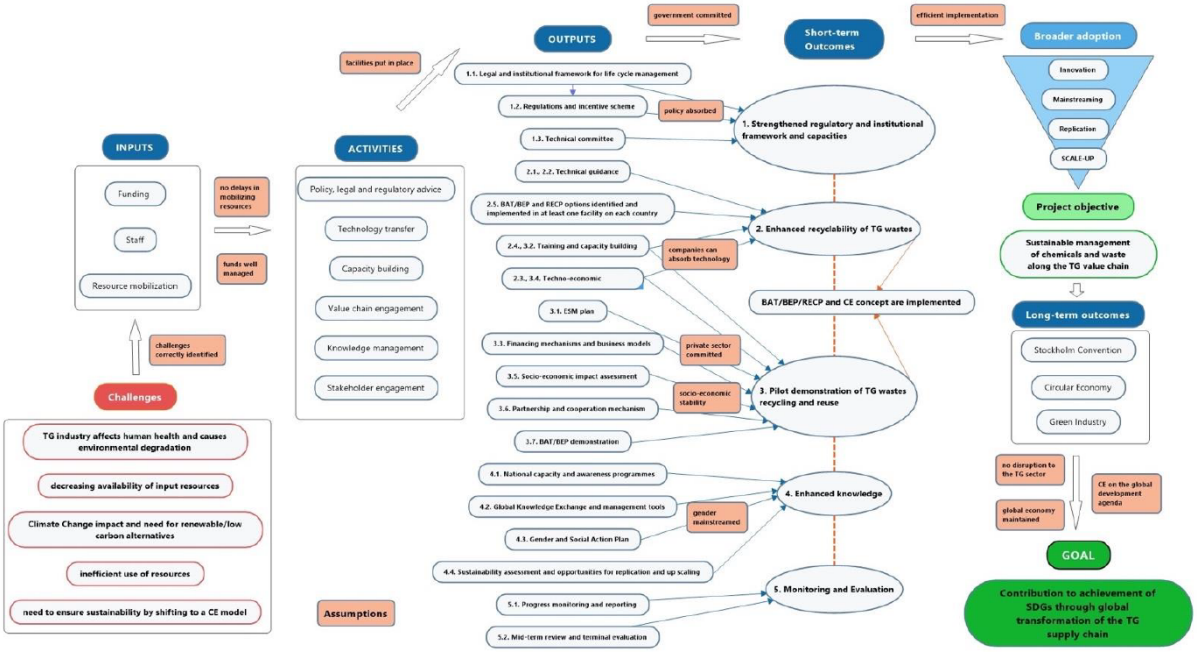


Figure 11: Theory of Change

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[1] http://www.dac.gov.za

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[1] World Bank, 2017

[2] World Trade Organization, 2014

[3] South African Revenue Service (SARS), 2020

[4] (https://www.environment.gov.za/search/node/sustainable)

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[1] Bennett, M. (2017). Africa's Inspired Apparel Sourcing Hotspot: Lesotho's Textiles, Apparel & Footwear Manufacturing Industy. *Tralac?s* 2017 Annual Conference . Cape Town

A4.1. Component 1: Strengthening of regulatory and institutional capacities for adoption and promotion of Circular Economy (CE) in the textile and garment sector

The main goal of Component 1 is the creation of the necessary institutional frameworks, effective policy control and incentives and technical resources to advance in the Circular Economy agenda in the TG sector along the whole value-chain by promoting BAT/ BEP/ RECP while preventing/ reducing POPs and other hazardous chemicals.

The current policy, regulatory, and financial environments do not provide incentives for the phase out of POPs and CoCs. Competition on costs remains a key driver over sustainability, both for the SMEs and different country governments. The criteria to use chemicals are predominantly price and availability, followed by extended credit terms and compliance with quality requirements. The COVID pandemic has led to extreme competition in the sector which forces the facility management to cost-cutting.

The National Executing Entities (NEE) (Ministry of Tourism, Environment and Culture of Lesotho; Directorate of the promotion of Blue and Green Economy in the Ministry of Environment and Sustainable Development of Madagascar; National Cleaner Production Centre of South Africa (NCPC-SA) of South Africa) will lead extensive consultations with wide-range stakeholders engagement in their respective countries in the drafting process of policy documents and UNIDO will provide the necessary support during the whole process.

Output 1.1. Legal and institutional framework for life cycle management of the TG supply/value chains.

Activities will consist of

1.1.1 Gap analysis and evaluation of legal mandates, institutional capacities and review of the relevant existing laws and regulations, leading to proposing a revised legal framework after extensive consultation with wide-range stakeholders engagement (Ministries, private sector, civil society, etc.) to strengthen the legal and institutional framework to promote circular economy in the TG sector including technical infrastructure for implementation of BAT/ BEP on POPs, hazardous chemicals and textile waste management as well as RECP options (energy efficiency, renewables) will be promoted and strengthened.

1.1.2 Incorporate the appropriate hazardous chemicals (including POPs) and wastes specific legislation for a toxics-free TG sector Lesotho, Madagascar and South Africa.

1.1.3 Develop policy/strategy to support implementation of EPR programmes/activities for the life cycle management of input and intermediate materials, by-products, products and waste in TG supply/chains

1.1.4 Carry out Capacity building activities and conduct trainings to strengthen governments? bodies to enforce regulations.

1.1.5 An implementation of a national scheme for segregation, storage and management of POPs chemicals and wastes will be also assessed in Lesotho and Madagascar in accordance with BAT/ BEP guidelines to meet SC/ BC and other relevant criteria. The Ministries of Environment will work with the Ministries of Industry and Ministries of Finance (National Revenue Authority, in particular) among others, to commit in-kind and in-cash contributions towards enforcement of these regulations.

1.1.6 Strengthen the testing and analytical capacities in the countries to ensure input materials, products and wastes in TG value chain are free of hazardous chemicals.

Output 1.2 Regulation and incentive scheme for promotion and sustainability of circular

economy in the TG sector.

Activities will consist of

1.2.1 Set targets and/or incentives to promote/enforce the practices and sustainability of circular economy in the sector, based on the gap analysis and evaluation report and to strengthening the legislative network. For example, incentives for collection and recycling of textile waste while banning its incineration, especially in Lesotho and Madagascar where this practice is still occurring and in all participating countries where most of the textile and garment waste in sent to landfills.

1.2.2 Develop a masterplan/national strategy for the transition to circular economy using the TG sector as a pilot case

Output 1.3 Technical Committee for Circular Economy in the TG sector

Activities will consist of

A Multisectoral Technical Committee for Circular Economy in the TG sector will be legally established and made operational. The strengthening of capacity to promote Circular Economy in the TG Sector is multifaceted, involving establishment of a coordination mechanism and targeted training. Coordination with other POPs projects in the African region such as, in the case of Madagascar, a Southern Africa Development Community (SADC) project on POPs management and the Africa ChemObs project will also be ensured and will contribute to overall POPs management and monitoring in the country. The project ?Integrated health and environment observatories promoting legal and institutional strengthening for the sound management of chemicals in Africa ? African ChemObs? aims to enable countries to meet their reporting obligations under the Basel, Rotterdam and Stockholm Conventions, promote evidence based policy making as well as increase investment on chemical and waste infrastructure.

1.3.1. Prepare the Terms of reference (TOR) for the functions and activities of the Committee, its membership, responsibilities including providing technical advice

and support to the project. The committee will include the relevant ministries, TG associations, NGOs, and relevant stakeholders.

1.3.2. Reports and recommendations of the Committee will provide inputs into the development of a national strategy/masterplan for transition to circular economy in the participating countries.

A4.2. Component 2: Efficient and POPs-free textile manufacturing process through the implementation of BAT/BEP and RECP investments

The PPG phase determined little regarding the use of POPs and CoCs in the textile value chains of the countries beyond what is historically and globally known through academic channels. Country regulators nor TG facilities have sufficient data to determine the scale of the use of POPs specifically. The PPG reports did identify priority sectors and brands most likely to be using POPs and Perfluoro-C8 chemistry, including products for public procurement (e.g. military, health sector, firefighting); outdoor industry (water repellency); and home textiles (flame retardancy, oil and stain repellency). Therefore, it is critical that education be provided, and an accounting created. B best available techniques to achieve this action are full chemical inventories, covering both POPs and other CoCs. Testing of chemicals will also be a component of this section to determine which chemicals protected under trade secret are CoCs and POPs in violation of the Stockholm Convention.

During the PPG phase, an assessment of the textile and garment sector was undertaken to identify and quantify the POPs and other chemicals of concern that are being used in the TG sector of the participating countries. Due to weak regulation, policy and institutional framework for chemicals management, there is insufficient data and information to fully establish the quantity of these chemicals in use. In addition, due to absence of correlation/mapping of the chemicals with their tradenames, it is also difficult for the consumer textile mills/industries to identify and confirm the active ingredients in the specialty chemicals that are being used in the production processes. This is also due to the lack of properly documented database of chemical inventory and tracking tools to for their identification, classification and management.

However, there are textile and garment making industries that are involved in the manufacture of special applications wears, gears and clothing that require the application of POPs and PFAS for stain repellency, water repellency, flame retardancy and fire resistance. There is also a lack of and/or inadequate national capacity and laboratory infrastructure for POPs chemical testing and analysis in order to ensure their effective management and control.

In Africa, especially in the countries of coverage of the project, majority of the textile fabrics used in the garment and apparel making are imported from China, Taiwan, Hong Kong, India, etc. This can be attributed to the fact that compliance with international standards and MRSL requirements by the local TG sector industries cannot be ascertained/established. The weak regulatory framework and lack of adequate testing and analytical capacities are encumbering the compliance monitoring and enforcement of environmental and quality standards of imported fabrics for garment making with RSL requirements and provisions of the global environment agreements on chemicals and waste management including the Stockholm Convention on Persistent Organic Pollutants.

In order to ensure a comprehensive assessment of POPs and other chemicals of concern in the TG sector and move the sector to a more toxic-free and more circular business model, the scope of the chemicals to be covered will need to be broadened to include per- and poly-fluoroalkyl substances (PFAS) in view of their specific application in the TG sector. The inventory of POPs and other COCs will be the first in a series of activities that will be carried out to identify capacity gaps; policy and institutional deficiencies in order to develop appropriate intervention strategies.

The main goal of Component 2 is to implement BAT/ BEP/ RECP methodology and Circular Economy concepts for the prevention and reduction of POPs and other hazardous chemicals and materials used in textile and garment production facilities as well as its substitution by Environmentally Sound Alternatives (ESA) including non-chemical alternatives, in line with the requirements of the SC and National priorities, while enhancing the recyclability and reuse of textile and garments wastes through POPs-free textiles and garment manufacturing. The component will also introduce RECP options such as wastewater minimization, pollution prevention and control and management, energy efficiency and renewable energy implementation.

In textile manufacturing processes, process improvement strategy will deploy UNIDO/UNEP resource efficient and cleaner production (RECP) techniques to improve production efficiency, reduce resource intensity; minimize waste and prevent pollution. Best available techniques and best environmental practices (BAT/BEP) will be implemented to prevent the use and formation of POPs and CoCs chemicals in the dyeing and finishing sections through the avoidance of chemicals containing elemental chlorine, and other POPs precursors as articulated in the BAT/BEP Guidelines of the Stockholm Convention.

In cooperation with the international brands and ZDHC, some environmental footprint performance improvement programmers such as the zero discharge of hazardous chemicals, restricted substances list management, better cotton initiative, sustainable apparel coalition etc. will be implemented. The adoption of international standards and implementation of certification schemes by the participating industries will be supported by the project.

The National Executing Entities (NEE) will lead extensive consultations with wide-range stakeholders? engagement in their respective countries in the drafting process of tools, guidelines and policy documents and UNIDO will provide the necessary support during the whole process.

Output 2.1. Chemical inventories for POPs and technical guidelines for environmental sound management of POPs chemicals and wastes

This component will provide technical guidance to participating TG production facilities including the introduction of the Circular Economy concept, RECP for resource conservation and waste minimization and BAT/BEP for prevention/reduction of POPs and improvement of process efficiency along the whole lifecycle of the textile / garment sector in selected facilities.

Activities will consist of:

2.1.1 Prepare inventory, database and material flow analysis (MFA) of chemicals used in the TG sector and the wastes generated, with information on supply sources, tradenames/commercial names; industrial application/uses; MSDS verification, recovery/reuse, environmental fate and transport.

2.1.2 Prepare technical guidelines, protocols and procedures for safe and environmentally sound management of the chemicals along the TG supply/value chains. This will include identification, labeling, stock-taking, record keeping, retention, tracking, retention; packaging, storage, transportation safety standards; PPE and emergency response equipment; accident/fire prevention and fire alarm system; spill prevention, control and countermeasures, emergency preparedness and response; first aid procedures/instructions etc.

2.1.3 Capacity building and institutional strengthening on establishment of a sustainable chemicals and wastes management system in pilot textile industries in response to MRSL/RSL requirements, and adoption of ZDHC tools and other relevant methodologies. This will include assessing the pilot industries and conducting appropriate training programmes.

2.1.4 Public education and awareness raising programmes on safe and sustainable chemicals and wastes management along the TG value/supply chains.

Output 2.2 Standard operating procedures (SOPs) and checklists concerning POPs pollution prevention and control

Also, the component will provide technical guidance on and standard operating procedures (SOPs) for BAT/BEP, development of investment prioritization criteria, as well as construction supervision, testing and full operation of BAT and BEP, ISWM and RECP interventions.

Activities will consist of:

2.2.1 Develop and implement standards operating procedures (SOPs) for handling and usage of chemicals and auxiliaries in the textile production process: input, process and output optimization and waste minimization in pilot TG industries.

2.2.2 Based on chemicals management assessment carried out, identify and evaluate BAT/BEP options for phase out and prevention/reduction of POPs and other hazardous chemicals in the TG industries. Select POPs-free and non-hazardous alternatives and technologies based on a screening matrix to be developed for selection of the most suitable alternatives/option(s).

2.2.3 Undertake detailed audit of the pilot facilities and identify options/strategies for implementing resource efficient and cleaner production (RECP) techniques and deployment of environmentally sound technologies (ESTs) for chemicals and wastes management.

2.2.4 Develop business models for sustainable chemicals management such as Chemical Leasing.

Output 2.3 Techno-economic feasibility of BAT/BEP and RECP options

Techno-economic feasibility of BAT/BEP for POPs alternatives (also non-chemical alternatives) for environmentally-sound management of eliminated chemicals, wastes and stockpiles including financing mechanisms and business models will be carried out.

Based on the PPG studies, preliminary options were identified to achieve the aforementioned objectives, i.e to avoid, at least to substantially minimize the application of chemicals of concern. The list includes good management practices, water, chemical and energy optimization/minimization and chemical substitutions. Some of the potential measures and their justifications:

Options	**Tools**
Equipment maintenance and operations audit	
Maintain equipment even if it not in use and check for leaks in order to avoid any unintentional loss of chemicals and materials.	Improved maintenance procedures, availability spare parts. Ensure flexibility and safety of process operations
Chemicals storage, handling, dosing and dispensing	
Each chemical should be stored according to the instruction given by the manufacturer in the Material Safety Data Sheet	Storage conditions, proper SOP. Chemical safety, loss and accident prevention

Use correct measurements (accurate weighing, dispensing and mixing) of chemical to avoid any over-dosage	Proper SOP?s, calibration procedure, proper utensils. Accident and loss prevention, risks mitigation
Install automated dosing and dispensing systems which meter the exact amounts of chemicals and auxiliaries required and deliver them directly to the various machines through pipe work without human contact.	Investment, production management, technical and economic feasibility, space requirements, automation requirement. Improved operational efficiency and optimization of process operations
Minimization/Optimization of chemicals used	
Establish and implement a chemicals management system (CMS) as part of the EMS to identify and to avoid chemicals of concern following the approaches of ZDHC, bluesign or GOTS	Policy, strategy, procedures, transparency, capabilities, improving production and process management; .Monitoring, tracking preventing and controlling the POPs and other hazardous chemicals pollution
Establish and implement a chemicals inventory with related data base and tracking system as part of the CMS	Traceability procedure, data collection, data analysis. POPs and other hazardous chemicals pollution prevention and control
Elimination of the use dyes which (may) contain POPs and uPOPs such as HCB, PCB or PCDD/F in chloranil-based dyestuffs (e.g. Pigment Violet 23) or in halogenated pigments, especially based on phthalocyanine (e.g. Pigment Green 7 or 36), or other dyestuffs/pigments	Analysis and continuous improvement procedure. Optimization of process chemicals and agents. Shift to green chemicals and new business models for chemicals management
Minimize the losses of chemicals by optimized application techniques (minimized volumes of foulards and preparation vessels) as well as zero discharge of residual formulations by environmentally sound disposal of segregated residues	SOP?s, measurement equipment, improved utilities, data collection, analysis and response. Shift to POPs alternatives and prevention of POPs/U-POPs emissions
Improving of coordination within laboratory and dye house,	SOP, management, development coordination indicators. Better product quality and improved operational performance
Water and Energy use	
Insulation of pipes, valves, tanks and machines	Investment, complexity of valves. Reduced resource intensity of industrial operations. Improved resource and energy efficiency and enhance productivity

Blower and water pump of the printing machine should be switched off when printing is not in operation	SOP, awareness raising Improved energy efficiency and better operations management and reduced severity of machinery and equipment
Optimized cleaning of the equipment (water-free cleaning and multiple cleaning steps with low amounts of water)	SOP, cleanliness indicator and measurement Improved water management and adoption of cleaner production
Re-use of cooling water as process water (and also for heat recovery).	Investment, space requirement, SOP. Process optimization and improved efficiency of operations
Optimizing boiler houses (re-use of condensed water, preheating of air supply, heat recovery in combustion gases	Investment, space requirement Energy recovery and improved resource/energy efficiency
Segregation of hot and cold waste water streams prior to heat recovery and recovery of heat from the hot stream. Application of pinch technology	Investment, space requirement. Process optimization and improved energy management and efficiency.

Activities will consist of:

2.3.1 Based on assessment undertaken under Activities 2.2.2 and 2.2.3, identify all relevant information and data to be collected for the techno-economic feasibility study: potential technology and service providers locally/externally, gather information on socio-economic data on relevant technologies, source and costs of required equipment and tools; availability of local expertise; economic and market conditions; labour costs; training institutions and technical support centres; technology transfer agreement and licensing fees, royalties; taxes, etc. Based on the information and data required, a framework/template for conducting techno-economic feasibility study of implementing BAT/BEP and RECP options will be developed.

2.3.2 Techno-economic feasibility study report (with cost-benefit analysis) of BAT/BEP and RECP options such as POPs pollution prevention and control guidelines; housekeeping measures, process optimization/modification by process- and production-integrated measures, wastes and wastewater minimization, pollution control and management, energy efficiency and renewable energy implementation will be prepared.

Output 2.4 Training and capacity building in BAT/BEP, RECP and Circular Economy.

Activities will consist of:

2.4.1 Training and capacity building of relevant stakeholders including policy makers, TG industries, business associations, entrepreneurs, financing institutions,

participating companies, NGOs, local service providers, consultancy companies, environmental agencies etc. in Circular Economy.

2.4.2 Identify service providers to develop training guidelines, modules and manuals for the various stakeholders and beneficiaries.

2.4.3 Training and capacity building on as BAT/BEP/RECP and based on the findings and recommendations of the gap assessment and the feasibility studies (2.3.1 and 2.3.2) in the entire TG value chains.

Output 2.5 BAT/BEP and RECP options identified and implemented in at least one facility for each country.

The purpose of this intervention is to ensure that textile/garment facilities prevent and reduce the import and use of POPs, new POPs and other hazardous chemicals while textile and garment and TG wastes do not contain POPs and other hazardous chemicals; thereby making them highly recyclable and more available for recycling operations by the implementation of specific private sector investments.

The outcome of this component will be linked to the demonstration of the economic feasibility of the identified BAT/ BEP/ RECP options, even those under development, in the TG sector. Therefore, besides the BAT/ BEP/ RECP implemented in the selected companies, these co-financed investments will encourage wider circular economy investments in the whole TG sector in order to be in line with both national regulations and market demand.

The investment intervention of this component will demonstrate the recommended BAT/ BEP/ RECP options based on the findings of the assessments and the techno-economic feasibility studies (Output 2.3) such as equipment retrofitting, technology/equipment transfer, process modifications; installation and commissioning of new equipment and related building capacity and training. The pilot investment demonstrations under this component will be implemented in the all participating companies listed in the project document and the description provided in the ESMP (Annex J).

Activities will consist of:

2.5.1. Implement the most applicable BAT/BEP and RECP options for environmentally sound management of chemicals/wastes, enhanced productivity and efficiency of the textile and garment production.

2.5.2. Select the most technically feasible and economically viable options based on in-plant assessment and audits for each pilot industry.

2.5.3. Prepare the list required equipment/spares/ancillaries for process modification, retrofitting and facility upgrade.

2.5.4. Procure the required software, hardware and equipment/spares and undertake necessary in-plant installation/commissioning.

2.5.5. Develop standards operating procedures, occupational health and safety manuals; and training manuals.

2.5.6. Conduct in-plant training programmes and pilot demonstration.

2.5.7. Carry out in-plant assessment of process and operational performance improvement.

2.5.8. Assess the socio-economic impact of the BAT/BEP and RECP options implemented in the pilot industries/facilities. The UNIDO guidelines for Transfer of Environmentally Sound Technologies (TEST) will be used among other tools to implement sustainable production models in industry through integration of RECP into management systems.

A4.3. Component 3: Introduction of Circular Economy concept for uPOPs emission reductions through ESM of textile and garment wastes and pilot demonstration of textiles/garment wastes recycling and reuse.

As the removal of hazardous chemicals in textile production is a prerequisite for sustainable circular models, reducing and phasing out the use of hazardous chemicals in the textile sector is needed. The activities under this component will go beyond the shift to chemicals alternatives, but towards a non-toxic and circular economy approach in the textile and garment sector.

The main goal of component 3 is to promote the implementation of pilot demonstration for the reuse and recycling of textile and garment wastes through the introduction of circular economy concepts, BAT and BEP in existing and future reuse/recycling facilities with the final objective of reusing and recycling 100% of wastes in the future in an environmentally sound manner. The project will focus primarily on ?post-industrial/pre-consumption? wastes and not on post consumption waste such as worn garment. However, based on the pilot demonstration location and the assessments results, post consumption wastes might be included.

In the garment making production process; BAT/BEP will be implemented to avoid the use of hazardous chemicals in garment making and finishing. This will entail the introduction of eco-design techniques to minimize the generation of wastes; off-specifications and offcuts in the production process. The international brands such Nike, Puma, ASOS, Adidas, etc. are already implementing some of these activities under their corporate social responsibility (CSR) programmers individually and in cooperation with other players in their supply chains. This cooperation will be strengthened and coordinated by the project especially for garment makers that are suppliers to more than one global brand.

The project will promote the circularity of the textile and garment value chain through adoption of sustainable waste management plans and strategy. The project will identify opportunities for forward integration by the textile and garment sector through the reprocessing and recycling of TG wastes into the textile manufacturing process. Regarding contaminated wastes, the project will support the disposal in an environmentally sound manner through the application of appropriate BAT/BEP.

The National Executing Entities (NEE) will lead extensive consultations with wide-range stakeholders? engagement in their respective countries in the drafting process of tools, guidelines and policy documents and UNIDO will provide the necessary support during the whole process.

Output 3.1 Environmentally sound management (ESM) plan for textile/garment waste.

The technical assistance task of this component will provide technical guidance to key stakeholders including the introduction of the Circular Economy concept by developing an environmentally sound management (ESM) plan for textile/garment wastes.

Activities will consist of:

3.1.1. Textile and garment wastes mapping and characterization in the participating companies and the sector in general through

- ? Review of the database of textile and apparel companies (provided by local partners such as the Ministry of Industry or textile associations), and subsequent shortlisting of additional companies to be consulted

- ? Asses and consult (circulated a questionnaire to) the short list of companies to collect information on their types of operations, size, market, etc.

3.1.2. Develop a methodology for collecting TG wastes data of the pilot value chains to contribute to the national waste statistics/inventory (team/partner with the national statistic department/office).

3.1.3. Assessment of current TG wastes management and disposal practices, recycling businesses and their linkages with the municipal solid waste management system.

3.1.4. Develop environmentally sound management (ESM) plan for textile/garment wastes in the participating companies which will be integrated to the municipal/national management plan/strategy.

3.1.5. Asses interregional wastes flow/trade especially between participating countries.

Output 3.2 Training and capacity building in ISWM and BAT/BEP for ESM of textile and garment wastes.

Activities will consist of:

3.2.1. Develop training materials and technical guidelines for sustainable TG wastes management along the supply/value chains based on best available techniques (BAT) and best environmental practices (BEP) for promotion of circular economy and entrepreneurship development

3.2.2. Conduct trainings and building capacity of key stakeholders and informal sector on wastes data collection and integrated solid waste management (ISWM) and BAT/BEP for ESM of textile and garment wastes/discards for uPOPs/ GHGs prevention/reduction and degraded land reduction/mitigation.

Output 3.3 Financing mechanisms and business models for circular economy.

Activities will consist of:

3.3.1. Review global innovative business practices and economic models in the TG value chain

3.3.2. Identify and evaluate existing financial mechanisms, facilities, and incentives for green investment financing; incubation schemes, leverage financing and venture capital for innovative business ideas

3.3.3. Develop business models and financing mechanisms for sustainability of TG waste recycling and reuse operations; extended producer responsibility (EPR), entrepreneurship development and business to business (B2B) linkages, socio-economic impact assessment of project intervention on the TG sector and value addition to national economy, including by enlisting the support of the PFAN advisors in the region.

3.3.4. Establishment of entrepreneurship scheme for sustainable TG waste recycling and management

3.3.5. Link/access to ongoing financial and entrepreneurial African programmes, trainings and resources (eg. AfDB, UNIDO?s Global Cleantech Innovation Programme, UNEP InTex in South Africa, Reach for Change in Ethiopia, GIZ in Ethiopia, GreenCape in South Africa, etc.).

3.3.6. Entice projects and businesses to access PFAN services to mobilize private sector financing

Output 3.4 Techno-economic feasibility study of BAT/BEP options for recycling/reuse of textile and garment waste.

Based on the PPG studies, preliminary options were identified to achieve the aforementioned objectives, i.e to avoid, at least to substantially minimize the application of chemicals of concern (Component 2) as prerequisite for sustainable circular models/recycling/reuse. The list includes good management practices, and end-of-pipe treatment options. Some of the potential measures and their justification:

Options	**Tools**
Management of waste streams	
Establish and implement an environmental management system (EMS).	Policy, strategy, procedures, cost for certification, required capabilities. Better/enhance corporate social responsibility; Adoption of best practices and ISO 14000 certification
Separate collection of unavoidable solid waste	SOP, awareness raising. Environmental pollution prevention and control
Reduction of packaging	Communication with suppliers; Ensure green procurement policy and green supply chain management
Use of returnable containers	Communication with suppliers
Recycling of textile wastes	Establish a collection and processing system, involve stakeholders; sound solid waste management plan supported by material flow analysis
Recycling Option	
Reuse of residual printing paste based on its perishability by collecting and sorting.	SOP, containers, storage conditions, labelling Implementing zero to landfill plan as part of circular economy implementation strategies

Reuse and/or recycling of cleaning water to optimize the cleaning of the printing equipment.	Investment, space requirement, SOP, cleanliness indicator. Improved water and resource management for waste minimization and pollution prevention
Collect paste from the drums manually by scrappers	SOP. Environmentally sound solid waste management for pollution prevention and control
Collect and reuse the print paste of all types	SOP. Environmentally sound solid waste management for pollution prevention and control
Collect and reuse the print paste from rotary printing (pumps, pipes and squeezes)	SOP. Environmentally sound solid waste management for pollution prevention and control
Recycle of treated waste water to non-critical areas	Investment, space requirement, quality control

Activities will consist of:

3.4.1. Techno-economic feasibility study of BAT/ BEP options for recycling/reuse of textile and garment wastes will be done in order to see the potential of application of BAT/BEP that would lead to reduction of environmental impact and creation of green jobs. The assessment will also review the main aspect needed i.e. administrative, managerial and technical further improvements.

Output 3.5 Socio-economic impact assessment of project intervention

Activities will consist of:

3.5.1. Review and provide evidence of the environmental and socio-economic impacts of different sustainable economic models in the textile value chain

3.5.2. Carry out socio-economic impact assessment of project intervention on the TG sector and value addition to national economy. The assessment will include the social impacts (e.g. health), economic impacts (can include effects on employment and jobs creation), new investments, economic growth and environmental impacts.

Output 3.6 Partnership and cooperation mechanism for supply chain management.

The project will establish partnership and cooperation with global fashion brands, their suppliers and global textile organizations. Although currently the cooperation between many of the textile and garment makers and the international brands focuses mainly on meeting contractual obligations and commitments, there are a lot of opportunities for cooperation and partnership between the textile and garment producers and the international fashion brands in jointly implementing mutually beneficial corporate social responsibility programmes. The project will facilitate this cooperation by supporting the textile garment producers to sign in to relevant programmes and encouraging the fashion brands to provide necessary support for TG producers.

Activities will consist of:

3.6.1. Identify potential and emerging supply sources in Africa for the global brand?s supply chains.

3.6.2. Provide support and guidance on the prequalification process for selection as suppliers to the global fashion brands and facilitate linkage

3.6.3. Create clusters of TG waste generation/collection to create larger TG waste streams for recycling operations to benefit from economies of scale.

3.6.4. Develop national strategy for the TG supply chain management.

Output 3.7 BAT/BEP demonstration for ESM of POPs chemicals and textile/garment wastes

Based on the assessment findings (output 3.4 and output 3.5) on the BAT/BEP options for recycling/reuse of textile and garment wastes generated in all participating facilities, component 3 will ensure economic viability and financial profitability of private sector investments in pilot demonstration/technology for the ESM of TG wastes from the selected TG facilities. Under this component, the project will link to ongoing TG waste initiatives, other TG industrial facilities wastes and if possible municipality TG waste, in order to maximize the benefit of the pilot recycling/reuse technology/facility.

Activities will consist of:

3.7.1. Demonstrate BAT/ BEP options involving technology/equipment transfer, equipment retrofitting, process modifications, development of operation manuals, installation/commissioning of new equipment and related training and building to demonstrate the reuse, recycling and ESM of textile and garment waste in selected TG and recycling facilities, by assuring private sector investment implemented for the ESM of TG waste in selected TG facilities and private sector investment on reuse/ recycling facilities.

3.7.2. Link to ongoing TG waste initiatives, other TG industrial facilities wastes and municipality TG waste

A4.4. Component 4: Knowledge management for scaling up

Component 4 will support capacity building, knowledge sharing, information, education and communication across the different components and scale up project results nationally, regionally, and globally, by creating and curating knowledge, information, education, safer alternatives, and sound management practices.

The National Executing Entities (NEE) will lead extensive consultations with wide-range stakeholders? engagement in their respective countries in the drafting process of tools/guidelines or tools, guidelines and policy documents and UNIDO will provide the necessary support during the whole process.

Output 4.1 National capacity and awareness programs developed and implemented to increase ability of textile and garment sector, policy makers and other stakeholders to control POPs and CoCs as well as promoting CE.

Activities will consist of:

4.1.1 Developing a national KM and awareness plan for each country.

4.1.1 Assess the capacity of different stakeholders and identify knowledge gaps existing in the country/region.

4.1.2 Developing common and country-specific information materials for the different audiences and roll out of the information and awareness work plans developed on an annual basis by the national teams and endorsement by the National Steering Committees. These may include information campaigns but also personalized advisory services by the Ministries.

4.1.3 Developing and delivering of awareness and capacity building training as per national awareness/ communications strategies, and replicating training modules and materials created under Components 2, 3 and 4.

4.1.4 Development of training modules and teaching resources on ESM of chemicals and POPs-contaminated wastes, and training of users (governments and private sector actors) in the use and interpretation of data from reporting tools, linking to country reporting under the Stockholm Convention and SAICM. These resources can also be used in existing school curricula and university research programmers.

4.1.5 Strengthen and involve academic institutions such as universities and research centres to help improve or complement the curricula on improved technology and issues related exclusively to ESM of chemicals and wastes and all its technical, economic, environmental, and social implications.

4.1.6 Independent grass root mobilization, monitoring and participation in awareness campaigns by NGOs, trade unions and other civil society organizations to ensure a diversity of voices & messages can be communicated.

Output 4.2 Regional and Global Knowledge Exchange and Management tools produced and accessed by users globally.

This output will deliver a global knowledge management strategy (see Appendix 3) together with the UNEP sister project, with the basic aim to create global momentum and incentives for widespread adoption of the project activities. As described in the Strategy, and given the budget limitation, priority will be given to creating links to existing platforms with well-established user bases. The whole output will be coordinated by an Advisory Group on Knowledge Management, common to both UNEP and UNIDO projects, comprised of global partners (brands, governments, industry associations and networks) who will advise on the KM strategy and its delivery (see the KM Strategy Appendix 3). Regional knowledge hubs (Asia Garment Hub and AfDB).

The projects? Regional Executing Agencies (Africa Institute & BCRC Indonesia for the UNEP project) will provide the liaison with the project countries and ensure representation and inclusion of national knowledge and knowledge networks including links with regional knowledge hubs such as the AfDB's Fashionomics. This output will as well deliver the regional knowledge management plan. Given the budget limitation and to build on previous and existing efforts already present in the countries, region and continent, priority will be given to creating links to existing platforms with well-established user bases such as The African Development Bank's Fashionomics Africa initiative and the African Circular

Economy Alliance (ACEA). The whole output will be coordinated by Africa Institute, the Regional Executing Entity (REE), which will be part of the Global Advisory Group on Knowledge Management, ensure the liaison with the project countries and ensure representation and inclusion of national knowledge and knowledge networks and support NRDC, the global KM manager. Africa Institute will organize the Africa South-South meeting between UNEP Project in Asia and UNIDO Projects in Africa and coordinate/attend regional consultation /industry and media and public events.

Roles for each of the Advisory Group members & projects partners will be further refined in the Global KM Strategy during project inception.

The Global project funded activities (with costs shared with the UNEP sister project in Asia) are:

4.2.1 Refining the KM strategy: Personas (Identification of major target groups, their needs, motivations and behaviour); Survey tools to gather feedback on the knowledge strategy design and progress, aiming to identify gaps and opportunities to strengthen knowledge flows; survey on international brands ? to summarize and we can further refine or confirm during the project inception; Communication strategy, including social media, aligned with UNIDO & GEF & UNEP communication guidelines; Visual identity Social media strategy.

4.2.2 Connecting to an online Platform: As has been identified in the baseline mapping (Appendix 3), there are a lot of KM initiatives and actors on sustainable textiles. The project online presence will therefore focus on a central resource providing easy access for other platforms to connect to on chemicals in textiles and their relevance for enabling a circular textiles economy. From the initial analysis, the GGKP Platform would be well suited for cost-effective hosting of such a resource. Among others, the platform will host a database of multimedia resources classified by country, purpose, year, type (website, video, document) and topic (tools and best practices, training materials, toolkits, policy and legislation, meeting documents, etc.), interactive collaboration spaces including discussion forums and moderated Q&A, collaborative calendar with user-input events and others (to be further defined based on the user needs assessments to be conducted under Activity 4.2.1 above).

4.2.3 Delivering of the KM strategy including social media & media engagement, events including participation in industry events with side events and/or information booths on chemicals and textiles and bringing the voice of SMEs to global value chain stakeholders.

4.2.4 Organising a global meeting bringing stakeholders from the two projects in Asia and Africa together to exchange information and connect stakeholders for South-South learning and networking opportunities, after project mid-term.

The Regional activities are:

4.2.5 Map the different sources of information and existing documentation on ESM of chemicals and wastes and CE in the TG sector at the national and regional levels;

4.2.6 Identify gaps and build capacities of local and regional partner (Fashionomics Africa and ACEA) to host a sustainable exchange mechanism for the ESM of chemical and wastes and CE in the TG sector in the region;

4.2.7 Establish physical and/or virtual participatory sustainable exchange mechanism to synthesize and disseminate information and knowledge.

4.2.8 Support national events and organize the regional ones for relevant TG sector stakeholders (symposiums, workshops, conferences, courses, campaigns, exhibitions, expert group meetings, and others, face-to- face as well as virtual);

4.2.9 Co-organize the Africa South-South meeting between UNEP Project in Asia and UNIDO Projects and support/attend the Asia meeting.

4.2.10 Document and disseminate the lessons learned and information produced as a result of the pilot experiences implemented within the project and share these on the Regional Platform website, Global Forums and other global dissemination channels

4.2.11 Explore publishing the results of the project in peer-reviewed journals.

4.2.12 Conduct media and information campaigns to inform the general public and key stakeholders about the challenges and progress present in the sector.

4.2.13 Engagement of global supply chain actors including brands, retailers (including online) to overcome communication barriers between a highly globalized industry, and ensuring that the communicating partners understand each other and that the right information is coming from, arriving to and understood by the correct persons.

In addition, the REE will contribute to the Global Knowledge Management strategy level through the following activities:

4.2.14 Develop a regional strategy/plan for communications in alignment with the global communication strategy.

4.2.15 Share relevant visual assets in a timely manner with the global KM for global promotion and dissemination.

4.2.16 The Regional communication manager/consultants/REE PMU will participate in global communications network/meetings, including regular calls, digital communication platforms, trainings and share relevant communication-related activities at regional level;

4.2.17 Support NRDC in organizing the global meeting bringing stakeholders from the two projects in Asia and Africa.

4.2.18 Publish at least one original blog article per year and contribute to other news articles, events, photo essays, videos as materials to the program website.

4.2.19 Adopt the global stakeholder engagement strategy and execute relevant activities at the regional that will contribute to the achievement of its goals.

4.2.20 Share relevant (non-confidential) project materials, approaches and documents that may provide relevant information to serve as examples or models for other countries; and,

4.2.21 Ensure that all public facing documents produced by the project are disseminated via the Global knowledge platform.

4.2.22 Organize investment promotion forums to disseminate business and investment opportunities in the TG sector emanating from the projects

The KM strategy finalization will begin in Year 1 but the roll out of the KM actions will start after Year 2, once project results and coordination efforts become available.

Output 4.3 Gender and Social Action Plan implemented, and benefits accrued to women workers.

The output will deliver on the Gender and Social Action plan (see Annex K), primarily by consolidating and compiling gender-relevant results from across the project components and other outputs on female participation in the textiles sector, occupational health and safety, social security and access to equal pay, and other gender relevant issues.

Activities will consist of:

4.3.1 Organising national stakeholder workshops to confirm and validate the project wide Gender and Social Action plan and translation to detailed national work plan.

4.3.2 Reviewing and gender assessment of key the project outcomes and reports, including the methodologies for developing inventories, pilot projects, training materials and knowledge products (all outputs) and especially before dissemination.

4.3.3 Delivering gender-specific training for women workers who may be exposed to hazardous chemicals.

A4.5. Component 5: Monitoring and evaluation.

This component relates to monitoring the project impact indicators, evaluation of the achievements and taking corrective measures if needed. All of the above outcomes will be monitored and verified through the activities included in this component.

Output 5.1. Project progress monitoring and reporting

An effective monitoring process of project impact and sustainability will be designed and implemented, including setting a periodic review process to monitor the quality and the state of progress of the project. Gender issues and environmental and social safeguards will be fully integrated in the project's activities.

Output 5.2 Mid-term review and terminal evaluation conducted

Independent mid-term review and independent terminal evaluation are conducted in accordance with established UNIDO and GEF procedures.

A.3 Alignment with GEF focal area and/or Impact Program strategies

This project is aligned with the GEF-7 Industrial Chemicals & Waste Focal Program in the facilitation of enabling environments and strengthening of national legislation and regulatory capacity for meeting obligations, with regard to POPs. Thus, seeking to significantly reduce POPs, hazardous chemicals and waste which are: (i) used by the TG sector along its value-chain; (ii) emitted through unsound processing and (iii) environmentally unsound incineration, disposal and recycling, not implementing improved sustainable recycling initiatives along the entire value-chain of the TG sector aligned with Circular Economy principles. This project is assuring TG private sector engagement while setting up sustainable financial models to ensure project ownership, quality, tradability, sustainability, replicability and scaling up.

The project is addressing the GEF-7 specific area of prevention of waste/ products containing persistent organic pollutants and hazardous chemicals from entering material recovery supply chains (including textile and garment waste management with the aim of preventing TG waste from entering solid waste) demonstrating alignment with the GEF focal area of Chemicals and Wastes especially Chemicals used/emitted from/in processes and products and Chemicals and Waste at end of life. The project will also introduce and use circular economy concepts along the entire life/value-chain with strong private sector engagement at national to global scales, BAT/ BEP / RECP to minimize and ultimately eliminate releases of POPs and other hazardous chemicals which will be pilot-tested in at least six selected demonstration sites.

A.4 Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

As per the GEF?s operational guidelines[1], incremental costs were determined compared to the business-as-usual scenario described under the problem and baseline sections (section A2 and A3). Under current conditions, sound management of chemicals and waste is done by a small minority of textile and garment companies and brands, largely in a voluntary manner. The project activities are needed to give participating countries a set of effective instruments to assess and manage chemicals manufactured by the chemical industry and used in the textiles and garment sector, minimize, and manage the generated TG wastes under the guidance and regulatory oversight of governments. This will ensure that all textile and garment companies are subjected to some level of sound chemical and waste management, thus levelling the playing field, and ensuring that minimum standards (e.g., the ban on use of POPs) are met universally. Furthermore, this will enable and strengthen national capacities to comply with requirements under the Stockholm Convention on current and future POPs.

The project will be implemented as a regional one (linking with Ethiopia project GEF ID 10683), which will facilitate regional outreach and dissemination of information and building of synergies with ongoing national and regional initiatives within the African continent. As earlier stated this project will be implemented in close linkage with UNEP regional project in Asia, and coordinate with other GEF projects working inside and outside Africa to will ensure further synergies and scaling up outside of the three countries. It should be however noted that more resources will be required in Africa due to differences of level of development of the TG sector, the economies of the two regions and the depth of involvement of the private sector. The textile sector in Africa is not as developed as in Asia, hence the project will address the issue of capacity building, regulatory and institutional framework, appropriate technologies, evaluation and selection, awareness raising and

public education will have to be addressed with greater emphasis. There is a lack of capacity in chemical tracking in Africa and the project will identify and apply the appropriate tools SAICM for the tracking and management of the chemicals in the TG sector.

The project?s co-finance and investment are mainly mobilised through the countries? governments and key private sector partners. The activities will build on the existing initiatives, policies, commitments, tools, and schemes. The participating companies committed to this project through cash and in-kind co-financing.

The project will be implemented along the entire TG value chain i.e.: textile industry, garment making and wastes recycling and reuse. This implies that the project is not addressing only the issues of POPs chemical but also wastes and create investment opportunities to promote circular economy.

As the current policy, regulatory, and financial environments do not provide incentives for the phase out of POPs and CoCs, component 1 of the project will support participating countries in the creation/amendment of the necessary institutional frameworks, effective policy control and incentives and technical resources to advance in the Circular Economy agenda in the TG sector along the whole value-chain by promoting BAT/ BEP/ RECP while preventing/ reducing POPs and other hazardous chemicals.

Component 2 of the project enables participating countries to identify POPs and other priority CoCs existing in the textile and garment sector. It will also equip companies to proactively address potential POPs that may be listed in the future. The Component will implement BAT/ BEP/ RECP methodology and Circular Economy concepts for the prevention and reduction of POPs and other hazardous chemicals and materials use in textile and garment production facilities as well as its substitution by Environmentally Sound Alternatives (ESA) including non-chemical alternatives, in line with the requirements of the SC and National priorities, while enhancing the recyclability and reuse of textile and garments wastes through POPs-free textiles and garment manufacturing. The component will also introduce RECP options such as wastewater minimization, pollution control and management, energy efficiency and renewable energy implementation. By working closely with government and public sector training institutions the knowledge currently limited to private sector stakeholders will be more readily available, particularly to the less organized SMEs who are not included in export value chains.

Component 3 will support this shift through a circular economy push in the textiles and garment sector, a national level enabling framework, and a review and access facilitation to incentives (financial, market based, or information based). The project will promote the circularity of textile and garment value chain through adoption of sustainable wastes management plans and strategy. The project will identify opportunities for forward integration by the textile and garment sector through the reprocessing and recycling of TG wastes into the textile manufacturing process. For contaminated wastes the project will support the disposal in an environmentally sound manner through the application of appropriate BAT/BEP. Eco design, wastes minimization technique and BAT/BEP will be applied in the garment making process. Opportunities will be identified for establishing of economically viable and financially profitable green investment projects from the recycling and reuse of the textile wastes.

Through the project intervention (section A4), the baseline work on the reduction of POPs and COCs as well as the promotion of CE will be scaled up significantly in the three project countries and outside of these. The latter will be accomplished through the project?s knowledge management component (component 4 and see section 8 on KM) that will work to share case studies, guidance, best practices, and lessons learnt outside of the project countries. This component will support capacity building, knowledge sharing, information, education, and communication across the different components and scale up project results nationally, regionally, and globally, by creating and curating knowledge, information, education, safer alternatives, and sound management practices. In addition, the project will provide National and regional platforms/networks with AfDB

for information and knowledge exchange and experience-sharing on circular economy and a global knowledge sharing platform with GEF regional textile project in Asia (UNEP).

A.5 Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

The project will achieve direct and indirect Global Environmental Benefits (GEBs) through all project components. POPs in textile industry are used to produce water-resistant and fire-protecting fabrics. This project will deliver significant reductions in the use of POPs, POP candidates and other priority CoCs in the textiles and garments manufacturing facilities, processing chemicals and TG products in Lesotho, Madagascar and South Africa. These countries are all among the Africa?s top five textiles or clothing producers in 2013. The combined apparel and footwear market in sub-Saharan Africa is estimated to be worth US$ 31 billion, according to data from Euromonitor International.[2]

The project expected outcome in the participating countries is the avoidance of an estimated 5.500 ton/yr of textiles contaminated with POPs, candidate POPs and other CoCs. In Africa, especially in the countries of coverage of the project, majority of the textile fabrics used in the garment and apparel making are imported mainly from Asia. A PPG study carried out by UNEP project in Asia (GEF ID 10523) documented an average use of 43 tonnes of PFC based chemicals per mill per year and showed that one of their Asian countries exported between 13,371 kg ? 580,057 kg of fabrics treated with PFC finishing each year between 2019 and 2021, leading to expected reduction of 14,835,700 kg of textiles contaminated with PFAS finishing (multiplying the average of this value (296,714 kg) by 10 (the minimum number of mills where pilot projects on hazardous chemical use reductions will take place) and the duration of the project of 5 years). Based on the study conducted during the PPG of this project majority of the cotton, yarn and fabric used in the garment making industries are imported from Asia. Hence there is a high likelihood that a significant percentage of the imported fibres and fabrics might contain PFAS, PFHxS and other perfluorocarbons (PFCs). This could not be ascertained due to lack of or weak capacities for standards testing, analytical and quality assurance in African to identify the presence of these chemicals in the imported fabrics for garment making. The project will achieve higher than target GEBs values if the presence of PFAS, PFHxS and other PFCs are prevented and/or avoided in the supply chains and hence the waste stock. The Asian market is more organized and established and this project will strengthen the testing and analytical capacities in the participating countries (output 1.1) to ensure the imports are free of hazardous chemicals. The project will work along the entire TG value chain in the three countries and by leveraging the partners and their network in the global supply chains. The project will not only meet the GEB target of 4,000 tons of textiles contaminated with POPs but will achieve higher GEBs well beyond the project countries through the use of the tools and replication of the successes demonstrated under this project in other countries where brands source production and other partners operate. Furthermore, Chemicals-free TG products will additionally benefit the consumers globally, through reduced volumes of hazardous waste being released into the environment through

post-consumer textile waste in downstream market countries and of hazardous chemicals released to the environment throughout the product?s lifespan.

The project aims to reduce several priority chemicals initially described in textile and garment sector list such as Restricted Substance Lists and Manufacturing Restricted Substance Lists, MRSL by a total of 5.5 tonnes (under indicator 9.1). This includes PFOS, PFOA and PFHxS at a minimum, and the project will also address additional PFAS chemicals that are candidate or potential future POPs, based on rapidly evolving regulatory landscape in many countries which are increasing the number of PFAS chemicals that are identified as having persistent characteristics. The target for PFAS reduction is based on quantitative data on documented use of a wider group of perfluorinated compounds (PFC) in the industry. Every 100,000m of fabric may contain up to 600 kg of active polymer chemicals, including typical durable water repellent (DWR) coatings usually containing 20-50% fluorine content.[3] Moreover, UNEP PPG study in their project in Asia (GEF ID 10523) documented an average use of 43 tonnes of PFC based chemicals per mill per year. The PPG phase determined little is known regarding the use of POPs and CoCs in the textile value chains of the countries beyond what is historically and globally known through academic channels. TG facilities don?t have sufficient data to determine the scale of the use of POPs specifically. The Safety and Technical Data Sheets (SDS) that accompany these technical chemicals do not provide information on chemical impurities or by-products contained in the product, and it has proven impossible to identify which PFC chemicals may contain PFAS and specific POPs. The PPG reports did identify priority sectors and brands most likely to be using POPs and C8 chemistry, including products for public procurement (e.g. military, health sector, firefighting); outdoor industry (water repellency); and home textiles (flame retardancy, oil and stain repellency). Therefore, the project updated output 2.1 to focus on chemical inventories, covering both POPs and other CoCs. The PPG did find evidence of residues of POPs on finished textile products (see Baseline section), confirming that POPs are still used. In the absence of quantitative SDS data, we assume that an average of 5% of PFC chemicals will be listed or candidate POPs chemicals, and therefore that the target of 5.5 tonnes of PFOS/ PFOA /PFAS/ PFHxS will be readily met by pilot projects in at least 6 facilities, each using an average of 40 tonnes of PFC chemistry per year (5% of 40 tonnes PFC used x 10 pilots = 12 tonnes used per year). Other POPs such as PBDEs may also be identified during the inventory and will further increase the GEB.

Textile and garment manufacturing is also listed as a key source of dioxin and furan emissions[4], which the project aims to reduce in the participating countries, hence contributing to reduced global emissions. An estimate of the global environmental benefit achievable during the life of the project can be carried out on the basis of the prevention and reduction of POPs, uPOPs and hazardous chemicals use and default emission factors using the UNEP Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs under Article 5 of the Stockholm Convention. Assuming that BAT and BEP measures implemented in at least six demonstration facilities during the current project with the support of GEF, this could bring companies from the current, baseline technology level to a BAT/BEP-based level, by preventing/ reducing POPs and hazardous chemicals use and reducing uPOPs and GHG emissions. The project target 11.5 gTEQ. The target uPOPs

emission reduction will be enhanced if the efficiency of coal-fired boilers are improved as this will have resultant uPOPs emission reductions.

According to ILO, exposure to hazardous substances in the workplace kills over 400 thousand people annually[5]. The project aims at 8,000 direct beneficiaries (of which 60% are women) through training, awareness raising and knowledge and capacity strengthening activities of textile and garment facility personnel, customs, and government partners, to promote safe and responsible production practices.

? Private sector companies? employee (with an estimated number of 2 companies per each country for the pilot demonstration) involved in the production, who will be trained on BAT/BEP/RECP. This training will also be open for the wider TG sector companies.

? Policy makers will be trained on legal and institutional framework for Environmentally Sound Management (ESM) of POPs and Circular Economy concept.

? Regulatory, compliance monitoring bodies and custom officers will be trained on Hazardous chemicals tracking, monitoring and enforcement.

? Training banking and financial institutions on green financing (financing of green investments in processes, products and services) appraising.

? Prospective entrepreneurs who are interested in recycling business will be trained.

? Training NGOs and public awareness raising on hazardous chemical including POPs, recycling, and investment opportunities

As co-benefits, the project will reduce the GHGs emissions from the open burning operations and land contamination and surface /underground water pollution and resources consumption. The project also will reduce/prevent land degradation through improving waste management practices and prevention of open burning taking into consideration the limited available land and vulnerability of these countries to climate change.

A.6 Innovativeness, sustainability and potential for scaling up

Innovation

The introduction of circular economy concepts as well as BAT/ BEP/ RECP in the participating companies and the sector in general, is relatively new. The BAT/BET/RECP options will be identified based on the detailed assessment after the inception of the project. The examples and candidates are provided in the proposed alternative scenario sections (Component 2 and 3). Innovative production techniques will be fostered by incorporating means of zero-waste techniques (e.g. using off-cuts right at the production facility) and use of innovative ?green/alternatives? chemicals. This will enhance circular economy of the TG sector by reducing the use of natural resources, preventing/ reducing the use of POPs and hazardous chemicals, reducing health and environmental impacts while improving the efficiency and augmenting the profitability of TG facilities. The scale of the innovation of the options and technologies depends on the status of the company. Whereas innovation in larger companies mostly is centered on increased level of automation, advanced process and production management and state of the art technology, innovation in SME usually concerns implementation of measures concerning resource management, improved

production and process management, improved product quality, improved health and safety. In the larger companies also measures commonly implemented in SMEs can be found feasible especially when companies have experienced a rapid development and large production expansion.

Sustainability

The project has a high probability of being sustainable as it will partner directly with private sector companies and associations that has expressed their interest in the project and improving and investing in their environmental performance. The project objectives are aligned with national policies of participating countries. The enhancement and improvement of national regulatory mechanisms to promote circular economy in the TG sector will provide the framework for ensuring the sustainability of the project in the future years after project completion. The TG industry (both facilities and National Associations, National Development Agencies and major international brands) involvement in the CEO endorsement preparation as well as in all project stages will ensure ownership, commitment, cooperation and partnership from TG companies top management to move forward in the circular economy agenda. Minimizing chemicals, water, energy, materials consumption and waste generation will bring relevant economic benefits which will balance required BAT/ BEP/ RECP investments improving the TG facilities efficiency while reducing/ avoiding economic, social and environmental risks and impacts.

Project activities will also provide the basis for the support and capacity building of domestic research center and services in the circular economy in collaboration with Cambridge University?s Circular Economy Centre (CEC), BAT/ BEP/ RECP fields in the TG sector or others. This would generate a new breed of professionals with specialized expertise in this field and the development of new job opportunities, thus contributing to the economic growth while supporting moving forward in the circular economy agenda of the TG sector, other industrial sectors and participating countries as a whole.

The circular economy will provide new opportunities for economic diversification, value creation and skills development, going beyond waste management and recycling. Raising resource productivity, improved ?circularity? in product policy and reducing waste can greatly lower both resource consumption and greenhouse gas emissions, as well as reduce the supply risk of raw materials. Creating resilient circular value chains will increase the resilience to crisis (e.g. climate change, pandemics) by reducing raw material inputs. It can provide opportunities, such as improved market access (e.g. for producers of environmental goods and services) or financial savings from more resource efficient processes. To face any challenges in financing the transition to a circular economy, there is a need to rely on a combination of funding sources: mobilizing finance such as GEF funding and opportunities through the international brands programmes, etc. The project will provide technical assistance to build capacities to prepare investment projects and through engagement of public and private sector locally, regional and globally. Also, the project will develop financing mechanisms and business models for CE which will facilitate the attraction of new investments in green industries. The project will undertake a techno-economic feasibility study which will provide technology, financial and socio-economic data for sound investment decision making.

Scaling up

The basis for scaling up and replication of circular economy in the TG sector is embedded in the training, awareness and capacity building activities with the dissemination of circular economy concepts, BAT/ BEP/ RECP relevant information, experience and lessons learned. The holistic approach to prevent/reduce POPs/ hazardous chemicals use and its substitution by non-chemical alternatives if possible, the application of the RECP methodology including energy efficiency and renewable energy technologies, coupled with an effective promotion and enforcement of BAT/ BEP, could be used as a reference for the TG sector of other countries, the African region and other major TG regions facing similar challenges.

This will also be achieved by the active participation and involvement private sector and global brands/foundations like CEC, Sustainable Fashion Academy (SFA) and ACEA, which has a large repository of information and knowledge on Circular Economy and has also developed a number of

training toolkits and methodologies on CE and transformative change with other international partners. The project will use the knowledge, network and expertise of Zero Discharge of Hazardous Chemical ZDHC, which will carry out certified training and capacity building Programme on sustainable management of chemicals in industries. Already most of the global brands in the TG sector have signed up to the ZDHC Programme. With the active involvement of both of them, the project will be able to mobilize and enlist the commitment brands like ASOS, Epsilon, etc. which will drive and realize the expected transformational change. Furthermore, through facilitating access to low cost investment financing sources like Levi?s work on PaCT, suppliers can get access to low-cost financing to invest in up scaling the project.

Component 4 will further scale and sustain project results and best practices. The project will establish regional cooperation and network for information exchange and experience sharing which will be disseminated through the AfDB?s African Circular Economy Alliance (ACEA) and Fashionomics Africa (refer to the Regional Knowledge Management Plan Appendix 4). Furthermore, the project will be implemented in close linkage with UNEP Asia regional textile project (GEF ID 10523). Within the UN, visibility will be gained by those private sector and other stakeholders who are engaged in the project and exemplary government and corporate performance will be disseminated including via the UN Alliance for Sustainable Fashion and other mechanisms (refer to Appendix 3 on Knowledge Management).

In the process of developing the project, there have been broad based stakeholder?s engagement to be able to establish synergies and complementarities among relevant projects, Programme and initiatives. This has been articulated in the Stakeholders Engagement Plan (Annex I)

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[1]https://www.thegef.org/sites/default/files/documents/OPERATIONAL.GUIDELINES.FOR_.THE_.APPLICATION.OF_.THE_.INCREMENTAL.COST_.PRINCIPLE_0_0_0_0.pdf

[2] Investing in the Creative Industries: Fashionomics, 2013, https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Fashionomics_creative_industries_executive_summary_brochure.pdf

[3] Personal communication, Dr. Thomas Schaefer of the bluesign? Technical Academy.

[4] Government of China, Stockholm Convention National Implementation Plan (2004).

[5] ILO, Facts on Safety at Work, 2012

---

[1] Iraldo, F., Daddi, T., De Giacomo, M., Nabil, M., Askar, Y., Higazy, M., . . . Massoud, S. (2012). Best Available Techniques (BAT) for the textile industry in Egypt. BAT4MED

---

[1] Bennett, M. (2017). Africa's Inspired Apparel Sourcing Hotspot: Lesotho's Textiles, Apparel & Footwear Manufacturing Industry. *Tralac?s* 2017 Annual Conference . Cape Town

---

[1] UNEP, 2020, Sustainability and Circularity in the Textile Value Chain - Global Stocktaking. Nairobi, Kenya, https://www.oneplanetnetwork.org/sites/default/files/sustainability_and_circularity_in_the_textile_value_chain_-_22_october_2020.pdf

[2] Quantis, 2018, Measuring fashion - Environmental Impact of the Global Apparel and Footwear Industries Study - Full report and methodological considerations, https://quantis-intl.com/wp-content/uploads/2018/03/measuringfashion_globalimpactstudy_full-report_quantis_cwf_2018a.pdf

[3] Ellen MacArthur Foundation, https://ellenmacarthurfoundation.org/topics/fashion/overview

[4] UNEP, (2020) *Sustainability and Circularity in the Textile Value Chain - Global Stocktaking*

[5] UN Environment, 2011, CiP textile case study The Chemicals in Products Project: Case Study of the Textiles Sector

[6] Clean Clothes Campaign and others, Pakistan Safety Report (2019) https://cleanclothes.org/file-repository/pakistansafety-report.pdf/view

---

[1] UNEP, 2020, Sustainability and Circularity in the Textile Value Chain - Global Stocktaking. Nairobi, Kenya, https://www.oneplanetnetwork.org/sites/default/files/sustainability_and_circularity_in_the_textile_value_chain_-_22_october_2020.pdf

---

[1] UN Environment Programme (2020). Sustainability and Circularity in the Textile Value Chain - Global Stocktaking. Nairobi, Kenya.

[2] Quantis. 2018. Measuring Fashion: Environmental Impact of the Global Apparel and Footwear Industries.

[3] UN Environment Programme (2020). Sustainability and Circularity in the Textile Value Chain - Global Stocktaking. Nairobi, Kenya.

[4] Quantis, 2018, Measuring fashion - Environmental Impact of the Global Apparel and Footwear Industries Study - Full report and methodological considerations, https://quantis-intl.com/wp-content/uploads/2018/03/measuringfashion_globalimpactstudy_full-report_quantis_cwf_2018a.pdf

[5] A New Textiles Economy: Redesigning fashion?s future

---

[1] Goldstein B, Banda S, Cairncross E, Jiang G, Massey R, Miglioranza K, Samseth J, Scheringer M, Smith J. 2013.
Chapter ?minimizing chemical risks? from UNEP Year Book 2013: emerging issues in our global environment. 37?51

[2] http://chm.pops.int/TheConvention/POPsReviewCommittee/Meetings/POPRC12/Overview/tabid/5171/Default.aspx

[3] UN Environment Programme (2020). Sustainability and Circularity in the Textile Value Chain - Global Stocktaking. Nairobi, Kenya.

[4] UNECE Traceability for Sustainable Clothing (2017)

[5]Ellen MacArthur Foundation, https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy_Full-Report.pdf

[6] WTO, 2017

[7] Circular economy in Africa: Examples and opportunities. Fashion and Textiles. Ellen MacArthur Foundation

[8] https://www.eticanews.it/wp-content/uploads/2014/09/Report-Bank-J-Safra-Sarasin-Supply-Chains-in-the-Clothing-Industry.pdf

[9] Greenpeace Detox campaign, , http://www.greenpeace.org/international/en/campaigns/detox/

[10] Baseline macro-level information on the Chemical and Textile industry in Bangladesh, Implementation HUB B.V

Amsterdam, The Netherlands, September 2021.

[11] Guidance on preparing inventories of perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) listed under the Stockholm Convention on Persistent Organic Pollutants, December 2019

[12] Stockholm Convention Risk profiles: HBB (UNEP/POPS/POPRC.2/17/Add.3), c-pentaBDE (UNEP/POPS/POPRC.2/17/Add.1), c-octaBDE (UNEP/POPS/POPRC.3/20/Add.6), decaBDE (UNEP/POPS/POPRC.10/10/Add.2), HBCDD (UNEP/POPS/POPRC.6/13/Add.2), SCCPs

[13] Fashion for Good, 2018, Safer Chemistry Innovation in the Textile and Apparel Industry

[14] OECD (2015). OECD Environment, Health and Safety Publications Series on Risk Management No. 29 - RISK
REDUCTION APPROACHES FOR PFASS ? A CROSS- COUNTRY ANALYSIS

[15] Source: https://www.gminsights.com/industry-analysis/fluorotelomers-market

[16] Occurrence and use of highly fluorinated substances and alternatives Report from a government assignment, KEMI, Swedish chemicals agency, 2015

[17] Phenpimuk Supreeyasunthorn, Suwanna K. Boontanon & Narin Boontanon (2016) Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) contamination from textiles, Journal of Environmental Science and Health, Part A, 51:6, 472-477, DOI: 10.1080/10934529.2015.1128713

[18] https://www.afirm-group.com/wp-content/uploads/2021/07/afirm_perfluorinated_polyfluorinated_chemicals_v2.pdf

[19] Reference Document on Best Available Techniques in the Textiles Sector, https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/txt_bref_0703.pdf, the revised document will be released in 2022

[20] The goal of the Baltic Sea Action Plan (BSAP) of the Helsinki Commission (HELCOM) is to preserve the natural habitats and biodiversity of the Baltic Sea. The HAZBREF initiative, funded at the European level, was created to realise this plan, and carries out regular wastewater and air analyses of industrial plants. On the German side, the Federal Environment Agency (UBA) is helping implement the initiative. adelphi is providing support by preparing recommendations for the textile sector- https://www.adelphi.de/en/project/textile-industry-guidelines-baltic-see-without-chemicals

[21] European Network fort the Implementation and Enforcement of Environmental Law (IMPEL), Linking the

Directive on Industrial Emissions (IED) and the REACH Regulation (I and II), https://www.impel.eu/wp-content/uploads/2016/08/ToR-IED-and-REACH_2013_04_18.pdf and https://www.impel.eu/wp-content/uploads/2016/08/FR-2014-10-Linking-IED-and-REACH-II.pdf

[22] A New Textiles Economy: Redesigning fashion?s future
[23] Circular economy in Africa: Examples and opportunities. Fashion and Textiles. Ellen MacArthur Foundation

---

[1] UNEP (2019) Global Chemicals Outlook II https://wedocs.unep.org/bitstream/handle/20.500.11822/28186/GCOII_PartI.pdf?sequence=1&isAllowed=y

[2] KEMI (2016), Hazardous chemical substances in textiles: Proposals for risk management measures, https://www.eea.europa.eu/themes/waste/resource-efficiency/textiles-in-europe-s-circular-economy

[3] UN Environment Programme (2020). Sustainability and Circularity in the Textile Value Chain - Global Stocktaking. Nairobi, Kenya.

[4] UNEP. 2016. Global Gender and Environment Outlook

[5] GFA and BCG. 2017. Pulse of the Fashion Industry 2017.

[6] Textile Chemicals Market, Transparency Market Research, 2019

[7] Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs
under Article 5 of the Stockholm Convention on Persistent Organic Pollutants

[8] http://chm.pops.int/Portals/0/Repository/batbep_guideline08/UNEP-POPS-BATBEP-GUIDE-08-15.English.PDF

[9] USEPA estimate for 2017 https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/textilesmaterial-specific-data
[10] A New Textiles Economy: Redesigning fashion?s future

---

[1] UNEP, (2020), *Sustainability and Circularity in the Textile Value Chain - Global Stocktaking*

[2] Circular economy in Africa: Examples and opportunities. Fashion and Textiles. Ellen MacArthur Foundation
[3] https://www.grandviewresearch.com/industry-analysis/textile-market

[4] https://www.fairify.io/en/knowledge/supply-chain-tiers/

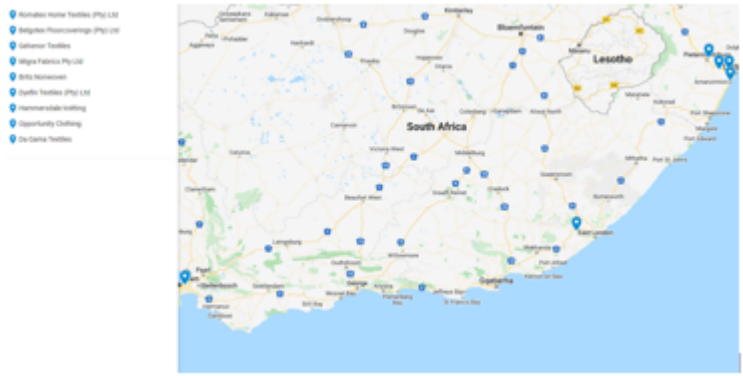
1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

Lesotho

Madagascar

South Africa



? Romatex Home Textiles (Pty) Ltd: 183 Epping Ave, Leonsdale, Cape Town, 7490, South Africa

? Belgotex Floorcoverings (Pty) Ltd: 20 Chesterfield Rd, Willowton, Pietermaritzburg, 3201, South Africa

? Gelvenor Textiles: Corner Anderson &, Morewood Rd, Elangeni, Mpumalanga, 3699, South Africa

? Migra Fabrics Pty Ltd: 35 Packer Ave, Epping, Cape Town, 7475, South Africa

? Brits Nonwoven: New Germany Industrial Park, Gate 5, 14 Valley View Rd, New Germany Industrial Park, New Germany, 3610, South Africa

? Dyefin Textiles (Pty) Ltd: 1 Dickens Rd, Athlone Park, Amanzimtoti, 4126, South Africa

? Hammersdale knitting: Unnamed Road, Hammarsdale - Sterkspruit, Mpumalanga, 3699, South Africa

? Opportunity Clothing: Hammarsdale - Sterkspruit, Mpumalanga, 3700, South Africa

? Da Gama Textiles: Hargreaves Avenue, Zwelitsha, 5608, South Africa

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

NA

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations Yes

Indigenous Peoples and Local Communities

Private Sector Entities Yes

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Annex I Regional SEP

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

Global, regional and national project stakeholders were mapped and consulted during the PPG (Annex I). Their key expectations, concerns and recommendations for engagement were analysed. Stakeholders will be engaged throughout the project cycle through meetings, workshops, trainings, interventions, and the development of different types of guidance that will be made available at the global management platform. National and regional workshops and meetings will be organised with and between different stakeholder groups (facilities personnel, regulators, textile, garment and chemistry industry associations, customs, global brands, regional partners and chemical service providers). Training will be provided for chemical supplier, TG facilities, customs, government laboratory personnel, government authorities, brands, and women specifically. Furthermore, guidance documents will be developed for regulators, brands, and SMEs.

The regional project coordinator at the Regional Executing Entity and the National Executing Entities will be responsible for monitoring stakeholder engagement and reporting regularly to the Regional

Steering Committee, Implementing Agency and GEF Secretariat on the status and progress against the below Stakeholder Engagement Plan.

The table below (Table **5**) presents the stakeholders envisaged to be engaged during the project implementation, how they were engaged during the project preparatory phase (PPG) phase, and how their engagement will be monitored during the project with specific parameters.

Table 5: Stakeholder Engagement Plan

Stakeholder	**Engagement in project preparation**	**Engagement in project implementation**
Global stakeholders		
Service and technology providers	The service providers were consulted on their different programmes and expertise on the TG sector. Some carried out specific data research and reports.	Service providers will support delivery of the project activities in TG facilities (all components) by the provision of their expertise on the textile value chain, and the application of their different training programmes, tools and solutions. Service providers include both private sector (e.g., ZDHC, ICLEI Africa, SFA, University of Vienna, etc.) and public sector, such as government technical colleges or regulatory capacity development units. Service providers will be engaged via the REE (Africa Institute with contracts and partnership agreements.
Brand and downstream buyers	During the PPG brands were engaged via ZDHC, SFA, local partners, UNIDO?s field offices, the service providers? expertise and the contacts with programmes like the Fashion Pact that represent a section of the biggest global brands.	Brands will be primarily engaged in the project via the Component 2 and 3 on global value chain policies, to strengthen chemicals and wastes management requirements and reporting within their supply chains. This will include sharing of project pilot results and best practices, and engagement via global networks including the SFA and ZDHC. Brands will also be engaged for the global KM output including via industry events, and the global KM platform on the available tools, best-practices, and guidelines. They will be represented on the Global KM Advisory group.
Global fashion and TG initiatives	Consultation meetings held with Ellen MacArthur Foundation, Fashion Pact/CI, GIZ, SFA	These global initiatives will be engaged via regular updates and will be represented on the Global KM Advisory group (C4).

Labs and testing houses	Labs were mapped during the PPG through governments and service providers.	Labs and testing facilities will be engaged in monitoring and importing activities (C2). Under component 1, the testing and analytical capacities in the countries to ensure, imports input materials, products and wastes in TG value chain are free of hazardous chemicals will be strengthened through training and capacity buildings.
National stakeholders		
Ministry of Environment/Industry	Ministry of Environment or Industry led coordination of country inputs into the project design, including supervision of national consultants, hosting national workshops and consultations with stakeholders. The other ministry was closely consulted by the national consultants, presented at national workshops and attended the Validation workshop	Ministries of Environment will be the main focal point for the project in the government and will host national project delivery units in Lesotho and Madagascar. They will play a lead role in defining all activities at country level, including approving the pilot projects methodologies and approaches, to ensure they will be aligned with regulatory requirements (C1); submit new policies and regulations. They will oversee the design and delivery of the national awareness raising campaigns, will be coordinate with global brands through global, regional and government events, and will have access to policy/strategy and tool provision guidance, research findings, international policy developments and industry success stories. They will also be represented in the Global KM Advisory group and project regional steering committees. Ministries of Industry will have a similar role to Ministry of Environment, including as co-focal points. They will be members of the National Working Group and be closely involved in identifying and engaging facilities; training and capacity building on chemicals management and for the replication and scale up.
Customs	Data provision requests by national consultants. Participated in national workshops.	Customs will be engaged through the establishment of PPP with importers and laboratories for chemical import and trade monitoring under Component 1. Furthermore, they will be beneficiaries from training under Component 2.

National industry association and alliances	The associations were consulted by the project national consultants on the presence of the TG facilities in each of the project countries and participated in national workshops	Textile associations will be engaged through workshops and partnerships for the mapping of TG facilities for pilot projects. They will directly participate in all the pilot projects, capacity building and knowledge sharing activities of the project to ensure they will be able to continue the pilots after the project.
TG facilities ? owners, staff and workers	TG facilities were contacted during the PPG regarding their interest in participating in the project?s pilot activities. Representatives participated in all the national PPG workshops. Some were interviewed or visited for the collection of baseline data on chemical use and wastes generated.	TG factories are direct beneficiaries of all project activities. Factories were engaged via value chains (e.g., brands, national textile associations) and by regulators, to participate in the project. They will be represented on the National Working Groups by the national textile associations.
Women garment and textile workers	Literature review and consultations done by gender PPG consultants and international expert. Women?s associations/NGO represented at national PPG workshops.	The female textile workers will be interviewed during the project survey phase to understand their stand on the exposure to harmful chemicals and to map their presence in the wet processing zone. Moreover, they will also be questioned om their knowledge on different OSH and chemical and wastes management regulations. The female workers will be one of the main beneficiaries of the project as they are more susceptible to the harmful effects of the chemical exposure due to their difference in their phycological characteristics. As workers in textile and garment facilities, activities include training on chemical inventory, reporting tools, safer alternatives, eco-innovation, supply chain policies, circular and eco-innovative approaches and national awareness and capacity building.

Upstream suppliers including chemical producers	Chemical producers were consulted during the PPG through service providers and technical support.	Chemical suppliers are direct beneficiaries of the project and will be supported to contribute to chemical inventories and reporting. They will benefit from project support to phase out import & supply of hazardous chemicals and replace them with less hazardous alternatives (e.g., access to expertise and analysis to identify POPs and CoCs; promotion of alternatives at industry events and the global KM platform C2 and C4). They will be engaged in national policy development via consultation (C1)
Researchers (all fields)	Researchers and textile experts were consulted during the PPG phase.	Researchers are engaged through the global KM strategy (C4). They will provide their expertise on solutions for chemical management, disseminate project results through their networks and align definitions and goals.

Select what role civil society will play in the project:

Consulted only; No

Member of Advisory Body; Contractor;

Co-financier; Yes

Member of project steering committee or equivalent decision-making body; Yes

Executor or co-executor;

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

The size of the TG sector varies across the group of participating countries reviewed for this report: Lesotho, Madagascar and South Africa.
There are also differences in levels of understanding and familiarity with the concept of the circular economy. Nonetheless women are overrepresented in the TG sector in all three countries. Little is known about the experiences of women in the informal circular economy and market places which is a gap in the data. In particular, as women may find entrepreneurial experience of the circular economy in the TG sector easier to access through informal networks, than through formal financing, retail and commercial institutions.
Therefore, a gender mainstreamed approach to industrialisation in the TG sector has the potential to make a significant contribution to gender quality in the region. Moreover, it is important to strengthen pathways into the TG sector for women, as well as strengthening transparent structures to facilitate their access to all levels of decision-making.
In particular, there are common areas where a gender mainstreamed approach could amplify the impact of coordinated gender capacity building efforts across the region:

- Gender mainstreaming of government policies and regulation in the environmental TG sector;
- Reviewing the status of women active in the informal TG sector and supporting their entry into formal employment
- Strengthening pathways into the TG sector for women, as well as strengthening transparent structures to facilitate their access to all levels of decision-making within the TG sector;
- Closing the implementation gap between national regulations to protect women from harm and provide security in maternity and the realities experienced in the workplace;
- Publicising success stories of women in the TG sector and facilitating access to financial support;
- Empowering women entrepreneurs and decision makers in the sector and increasing their visibility in the wider public;
- Enhancing gender capacity in unions and women in decision making roles;
- Enhancing mechanisms for monitoring and reporting gender-based violence and harassment; and
- Providing information on employment opportunities in the TG sector so that women are more aware of work opportunities

The TG sector across the region has experienced significant drops in demand due to the COVID pandemic. Still, the pandemic also presents opportunities for enhancing gender equality and the empowerment of women in the country. The continuous of industrialization of the TG sector and progress towards sustainable circular economy presents multiple opportunities to speed-up progress towards enhancing gender equality and the empowerment of women in Lesotho, Madagascar and South Africa.

A detailed gender baseline review and assessment, and Gender Action Plan, have been developed during the PPG. These are provided in Annex K.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making Yes

Generating socio-economic benefits or services or women Yes

Does the project?s results framework or logical framework include gender-sensitive indicators?

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

The private sector engagement is particularly prominent in this project and is expected to achieve measurable reductions of POPs and CoCs. Voluntary industry and procurement measures play an important role in chemical substitution and elimination, as regulation of chemicals of concern is often slow and difficult before legally binding restrictions are in place. This is especially true for large classes of chemicals like PFAS. Private sector is involved in many elements of this program: brand engagement and connectivity; delivery of inventories & chemical substitution; and training and capacity building.

During the development of this proposal, several textile and garment factories were visited and consulted in each country in the project, to seek project collaboration, partnership and sustainability through co--nancing and in-kind commitments. All companies visited were regularly investing and were planning to continuously invest on BAT/ BEP measures and they all agree to collaborate in the project. In addition, National Textile Associations and National Development Agencies in each participating country were also visited for project partnership, agreeing on collaboration and partnership in the project. Given the local knowledge and representativeness of the TG sector, National Textile and Garment Private Sector Associations such as the Textile and Garment Sector Association (Lesotho), the Groupement des Entreprises Franches et Partenaires (GEFP) (Madagacar) and the Textile federation of South Africa, South African Cotton Textile Manufacturer?s Association, South African Clothing and Textile Workers Union and National Cleaner Production Centre (NCPC) (South Africa) will be involved on specific project activities to maximize the applicability to the local context and project sustainability and scaling up. The TG private sector will be clearly attracted and incentivized by these National Associations and the project by showing the potential increase of the TG plant edciency and pro-tability through BAT/ BEP/ RECP actions.

Second, UNIDO already got the pay-in of international brands such as ASOS, Epsilon, etc. Utilizing global brands and retailers? purchasing power is essential to ensure reductions and ultimately elimination of POPs and CoCs. Many TG brands and retailers have made meaningful and transparent commitments on phasing out POPs and CoCs from their supply chains. Some even apply the precautionary principle that align with this program and manage PFAS as a class. Furthermore, specific policies, implementation plans, and tools have been developed and adopted in the private sector. Examples include Restricted Substances List (RSL) and Manufacturing Restricted Substances List (MRSL) to control chemicals used in production processes; and using emission and monitoring controls to reduce POPs and CoCs released into the environment.

Although some examples exist, further engagement is needed for brands to expand their chemical phase out commitments, enhance management practices and policies, and provide support to all stakeholders along their entire value chain. The global brands and retailers? purchasing power can also be used in ensuring the gender safety issues in terms of production. They can help introduce codes of conduct that would encourage the suppliers to adopt gender action plans and ensuring gender safety guidelines to be adopted for the mills. The newly adopted code of practice targeting the chemical safety for the TG and other industries can also work as a benchmark for the facilities. Brands and buyers should encourage the mills for the implementation of this code. The project will therefore engage these brands at global level to encourage and support them to further adopt chemical elimination policies at the highest corporate levels, via the Global KM Advisory Group; and targeted awareness and training program as part of the KM Strategy roll-out (Output 4.2). In addition, brands will be engaged by the technical coordinator & lead consultant to obtain their support in mapping their supply chain for the chemicals and wastes inventory.

Third, the private sector includes several technical service providers who are key partners of the project. The project technical components can be built upon these exiting tools and schemes. Examples include RSL lists developed by AFIRM and others, MRSL and wastewater guidance developed by ZDHC. Using these tools and partners is both more efficient than developing them from scratch. However, it is important to note that all existing schemes have room for progressive improvement. Some organizations and companies also provide alternative technology or green chemistry solutions, like Clean Production Action, Green Theme Technologies, and others.

Many of these institutions have also developed training modules to help brands and suppliers to establish and implement effective chemical management systems. These service providers also operate in a decentralized manner in the project countries through networks of accredited and experienced training mechanisms.

Both chemical use and waste management (inventory) baseline collection best practices, technologies and validation, as well as related trainings will be delivered in close coordination using service providers who have already developed these tools, solutions, and materials. The private sector partners will be engaged as contracted service providers and will also engage them as co-financing partners in the further development, scaling up their use across the sector. They will play a key role in advising the development of the project level inventory & pilot project strategies in engaging their national networks of trainers, laboratories, and audit or verification partners, and delivering training and brand engagement activities.

This project will ensure national and regional knowledge management sharing to ensure replication of the case studies and a long-term promotion of circular economy edciency, learning innovation among the countries and partners. On the global level, the cooperation with UNEP similar project in Asia, will ensure global corporations which play an important role to ensure the exchange of knowledge, lesson learnt and case studies.
Please refer to the Stakeholder Engagement Plan and co-finance letters to see the specific businesses and private sector partners who will be engaged in each of the roles described above.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

An overview of risks and potential risk management strategies is listed in Table **6**. In brief, the project involves multiple and diverse countries, and risks arise due to different chemicals management systems, political situations, varying access to reliable information and stakeholder commitment. A Climate risk screening (**Appendix 1**) were done for all participating countries to identify the hazards, assess vulnerability and exposure, rate the risk; identify measures to manage the risk.

COVID has had an enormous impact on the sector, with huge changes made too many businesses and considerable government mobilization to support the sector. It has coincided with an increase in attention in the sector on chemicals (?forever chemicals? like PFAS) and circular fashion. The potential for significant shifts in the sector is therefore high. Therefore, analyses of COVID-19 impacts, risks and necessary adaptation and mitigation strategies were done for all participating countries (**Appendix 2**)

Table 6: Project risks, impact and likelihood, proposed mitigation measures and links to project outputs.

Risk	Impact	Likeli-hood	Proposed mitigation measures

Risk	Impact	Likeli-hood	Proposed mitigation measures
COVID-19 Risks			
Restricted travel	Medium	Medium	Though most countries have reopened since the COVID-19 pandemic first hit, lockdowns and restricted travel measures continue. Meetings, workshops, and consultations will be held virtually as much as possible.
Decreased local support due to shifted priorities	Medium	Low	Due to the pandemic, the project countries have experienced a sharp decrease in growth in the textile and apparel sector. This may result in a decreased support for compliance with regulations, standards, reporting requirements and the other necessary actions to reduce the use of hazardous chemicals in the sector. Furthermore, it is expected that countries? political priorities may shift to recovery from the pandemic. To ensure continued support, activities will be validated with the national stakeholders, and the project will focus on communication that underlines the long-term benefits and business opportunities resulting from of its proposed activities.
Transmission of COVID 19 at pilot sites	Medium	Medium	The project will improve OHS measures in the participating companies. The company?s occupational health and safety management system incorporates the regulations for companies COVID 19 compliance.
Climate Change Risks			
Floods, increased temperature, drought , Cyclone	Medium	Low	The project will take into consideration the vulnerability of these countries to climate change especially the island (Madagascar). The project will raise awareness with regards of climate change and the project reduction of the GHGs emissions from the open burning operations and land contamination and surface /underground water pollution. Water resource management is important for the participating countries and will be addressed in the project through RECP including water recycling and reuse. Where relevant, activities to climate-proof facilities to these gradual impacts could be considered.
Gradual climate change impacts such as rising sea levels	Low	Low	Areas of South Africa are only a few meters above present sea level and Madagascar as an Island state may face serious threat of permanent inundation from sea-level rise. As such, the chemicals impact on wastewater is essential to minimize risks from flood events. Where relevant, activities to climate-proof facilities to these gradual impacts could be considered.
Operational/delivery Risks			

Risk	Impact	Likeli-hood	Proposed mitigation measures
Inadequate political support, regulatory framework partly formulated and not fully implemented and enforced. Change of governments leads to change of priorities	Medium	Medium	Policy/ decision makers will be involved from the inception stage of the project, to ensure that the countries? national priorities are considered and that political buy-in is ensured, especially on awareness activities on issues related circular economy, POPs, hazardous chemicals, hazardous waste, wastewater, waste (including textile and garment offcuts), air emissions as well as its environmental and public health implications. This project will provide support to reporting under the Stockholm Convention and meeting its provisions. The project will engage with government stakeholder all throughout the implementation. Furthermore, the national focal points will be regularly updated on the project progress to guarantee continued support.
The project partners do not sustain the project activities and benefits	Medium	Medium	The project will involve global actors and associations which have been active on this issue for over 10 years. The need for a sustainable solution is clear, and the project will publicize ? through the networks of the numerous and diverse project partners - the gains and successes of the project activities, bringing visibility to their efforts and progress, and stimulating continuity and replication.
Lack of cooperation from the informal sector to release textile and garment waste as well other waste potentially containing POPs.	Low	Low	Potential options and financial mechanism designed to incentivize the formal and informal sector. Economic incentive schemes will be explored and implemented to transform the informal sector into formal companies and jobs making the economy more circular
Technical Risks			
Inadequate data collection on POPs use.	Medium	Medium	Collection of data on POPs use has proven difficult. The project will work with and engage all stakeholders during the implementation to collect data.

Risk	Impact	Likeli-hood	Proposed mitigation measures
Project resources are not sufficient to ensure the necessary interventions to achieve the planned CE and waste management targets.	Medium - Low	Low	Full ownership of the project will be ensured through regular meetings and discussions with the TG private sector, local TG recycling companies and government authorities from the project inception phase to implement BAT/ BEP/ RECP in the TG sector as well as on the reuse-recycling of TG waste, using a Public Private Partnership (PPP) model, in this last case. The project will allocate enough grants and secure co-financing resources to implement sustainable BAT/BEP/RECP to address the issue of hazardous chemical and TG wastes. Furthermore, the private sector pledged or is expected to pledge and fulfil its commitment to scaling-up local investment in TG wastes management.
Lack of key technical capacity from public servants, technicians from the private sector, non-governmental agencies and academia on circular economy, POPs, hazardous chemicals, hazardous waste, TG waste and wastewater ESM as well as energy efficiency and renewable.	Medium	Medium	Promoting and monitoring mechanisms will be established to ensure necessary training, capacities and coordinated efforts in implementation and enforcement of regulations.
The project will not be able to map enough TG facilities and suppliers for the project interventions to take place	Medium	Medium	Extensive consultation and engagement have already been done, which will further be deepened during the implementation. The project will work with the governments, textile associations, different brands, and service providers to identify more facilities present in the project countries.
Social Risks			

Risk	Impact	Likeli-hood	Proposed mitigation measures
Stakeholders do not engage fully, resulting in not adequately addressing the project priorities nor achieving the desired outcomes.	High	Low	Government, supply chain, and related stakeholders will be engaged as described in the Stakeholder Engagement Plan. Project resources are planned for knowledge management and communications materials to raise interest among key stakeholders. Active engagement of UNIDO and partner networks to reach out to key stakeholder groups, to build interest and sustain focused efforts.

As per UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), the project has been categorized as ?B?. Category B projects are likely to have less adverse impacts on human populations or environmentally important areas than those of Category A projects. As a result, an Environmental and Social Management Plan (ESMP) was developed during the PPG (Annex J).

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

The organizational structure for the coordination and management of the project is illustrated in Figure **12**.?Each management body is described below. The micro assessment, using the Harmonized Approach to Cash Transfer tool were carried out for the executing entities. The outcome of the micro assessments for the Ministry of Tourism, Environment and Culture of Lesotho and the Directorate of the promotion of Blue and Green Economy in the Ministry of Environment and Sustainable Development of Madagascar identified areas that would require further improvements to the internal infrastructure (policies, regulations, deployment and improvement of system processes, personal training, etc.) in order to ensure adequate capacities and resources are available to support the execution of projects.

Accordingly, the project will, as part of the objectives of sustainability will support to increase their institutional capacities. Building on the results of the micro assessment, a needs enhancement assessment study will be conducted in year one and monitored during the duration of the project. This study will help identify the improvement areas as well as roadmap that will be used by the PEEs to further enhance their internal infrastructure and capacities. This will serve as a basis for this project as well as the execution of future projects, including those funded by other sources. Thereby the activity will help build local capacity and ownership, by enabling harmonization of the reporting across different projects (in aspects such as technical reports, financial reports, auditing, etc.). The scope of activities related to the capacity building will be reflected in the agreement signed with UNIDO.

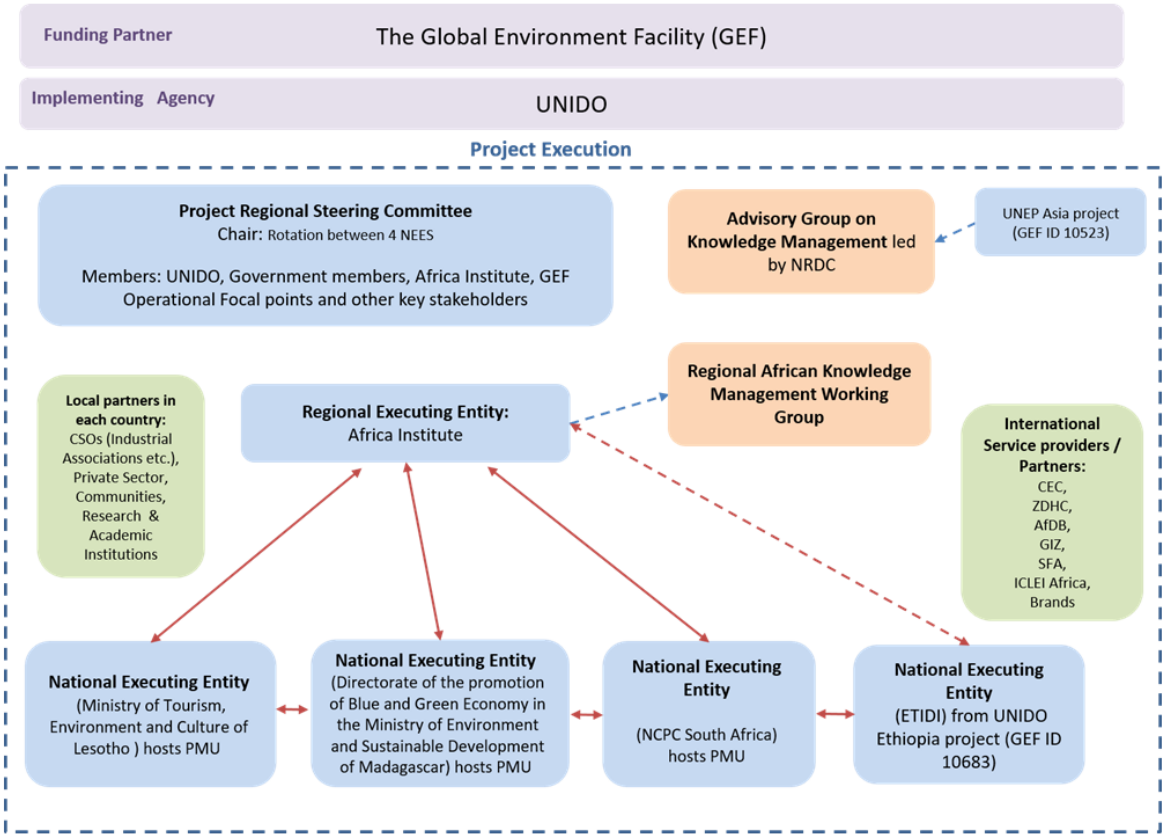


Figure **12**: Project management and coordination structure.

The?Implementing Agency? (IA) ?for the project?is the?United Nations Industrial Development Organization (UNIDO). The IA will be responsible for the overall project supervision, overseeing the project progress through the overall monitoring and evaluation of activities and progress reports of the established components. It will be responsible for quality assurance procedures, organize contracting with executing entities, and approve progress reports and clear disbursement. The IA will also monitor progress to ensure the proper quality of outputs. UNIDO will report project implementing progress to GEF. The IA will also take part in the Project Steering Committee (PSC) and can request PSC to meet outside of the planned schedule as deemed necessary.?

UNIDO?s comparative advantage is its mandate to promote and accelerate inclusive and sustainable industrial development (ISID) in developing countries. To support the development impact and effectiveness of its services, UNIDO applies a holistic and integrated programme framework that integrates the Organization's four core functions in: (i) technical cooperation; (ii) analytical and research functions and policy advisory services; (iii) normative functions and standards and quality-related activities; and (iv) convening and partnerships for knowledge transfer, networking and industrial cooperation. UNIDO will take the lead in finalising the project level data flow and reporting to the GEF Secretariat.

The?Regional?Executing Entity? (REE) ?is the Africa Institute for Environmentally Sound Management of Hazardous and other Wastes? (Africa Institute) and will execute, manage and be responsible for the project regional activities on a day-to-day basis. The regional executing entity (REE) will provide execution, management and coordination services at the regional level in close consultation and cooperation with the national partners and executing entities. The regional executing entity will prepare consolidated project reports and plans; execute regional activities such as regional assessment studies, international experts? meetings, international training and workshops, arrange international study tours and organize industrial visits training and coordinate knowledge management activities. The regional executing entity will arrange regional events such as dissemination of knowledge management results and project

steering committee meetings. The regional executing entity will also provide relevant procurement services and also coordinate cooperation/collaboration with international global brands. REE will serve as the secretariat of the regional Project Steering Committee and host its meetings. The regional executing entity coordinate the activities of the national executing entities, which will be identi-ed and engaged in the three participating countries. The REE will take guidance from the GEF implementing agency and the PSC in all matters concerning the project. In the delivery of its functions, it will be a member of the PSC.The REE will have the primary responsibility for delivering KM objectives and will be part of the Global Advisory Group on Knowledge Management, ensure the liaison with the project countries and ensuring representation and inclusion of national knowledge and knowledge networks; and supporting NRDC, the global KM manager. The REE will also coordinate all the regional activities with national executing entity for the GEF project in Ethiopia (GEF ID 10683). Africa Institute will also organize an annual financial audit of the regional activities of the project and transmit the report to the implementing agency (UNIDO).?The Centre is well positioned for this role as it serves the Parties to the Basel?and?Stockholm Conventions within the?African?region. The Africa Institute has?the following mission objectives, among others: provision of training on?the environmentally sounds management (ESM) of hazardous wastes; and identification and strengthening mechanisms, and encouraging the BAT/BEP and methodologies for transfer?of?environmentally sound technology on the management and minimization of the generation of hazardous waste, ?e.g. through case studies and pilot projects. The REE will contract the services of regional/international service providers and a research center for training and dissemination of the knowledge products.

A Project Steering Committee (PSC) ?will be established?to provide overall regional guidance and direction to the project, and to ensure country and regional ownership, integration, and governance. The decision-making members of the PSC will be representatives of the governments and the Implementing Agency.??Further key stakeholders will participate in the PSC to provide guidance but without decision rights. Africa Institute (REE) will act as the secretary to the PSC?and?provide regular project updates to the PSC.?The PSC members will support the NEEs in their respective countries. PSC will be chaired in a rotational manner by the three countries. The primary roles of the PSC are: (1) to provide overall guidance to the execution of the project; (2) to ensure good coordination among participating countries, agencies and other organizations; and (3) to approve any substantial change or addition of new project outputs in response to the emerging issues, including the annual work plan. The TORs for a PSC will be developed during the inception phase of the project. PSC meetings will be organised on an annual basis to discuss the progress of activities and amendments to the schedule, as needed, will be held face to face (COVID situation permitting), virtually or as hybrid meetings. GEF Operational Focal points of the six participating countries will also be invited to the PSC meetings and will be regularly informed about the project progress. The project steering committee will include an?Advisory Group on KM? (AGKM) which will provide guidance and inform the development of the global KM component. The AGKM members will include AfDB, GIZ, CPA, SFA, brands, and Conservation International (TBC).

The **National Executing Entities (NEEs)** are Ministry of Tourism, Environment and Culture of Lesotho, Directorate of the promotion of Blue and Green Economy in the Ministry of Environment and Sustainable Development of Madagascar, National Cleaner Production Centre of South Africa (NCPC-SA) of South Africa. The NEEs will be responsible for the overall management of activities related directly to the project execution in their respective countries. The NEEs will execute policy and institutional framework review; capacity assessment, provide some procurement services; organize awareness raising and public education; national workshops and training programmes, national stakeholders? mobilization and engagement; coordination of national pilot demonstration; progress monitoring and reporting. The NEE will also prepare national progress reports; provide

inputs into regional reports; and arrange and host national Project Implementation Committee (PIC) meetings.

Project Implementation Committee (PIC) will review the implementation and monitor the project activities at each country, resolve disputes, provide guidelines, provide recommendation to the PSC. The PIC will convene as required but at least twice a year.

A Project Management Unit (PMU) will be in charge of the day-to-day management of the project and be set up by the NEEs in each country. The PMUs provide necessary administrative and secretarial support to the PIC and host its meetings. It will be composed of a National Project Coordinator, Project Assistant, Financial specialist and the NEE will identify competent national experts, agencies, institutions, business associations, and NGOs/CSOs that will execute country specific activities and monitor progress of implementation. The PMU will regularly provide updates to UNIDO by submitting quarterly progress reports. UNIDO will share the updates with the PSC members and other relevant stakeholders.

The project will engage with a wide variety of partners and services providers along the entire CTG value/supply chain to holistically and inclusively where applicable address the issue of use of POPs; creation of recycling industries to promote resource efficiency and address un-intentionally produced POPs (uPOPs) emissions from opening burning of TG wastes. One of the major partners that the project will engage is the **Cambridge University Circular Economy Centre (CEC)** in order to benefit from the networks; expertise in and knowledge of circular economy in executing specific activities under component 2 and 3. CEC will also assist in developing new business models and financial mechanisms for the promotion of circular economy. As an education and learning institution the CEC in recognition of the specific technical requirements, will be strategically positioned to provide executing services for training of trainers (ToT), the development of tools, school curricula and university research programmes especially training of and knowledge sharing with two research centers in the region (one in Ethiopia and the other in South Africa).

Regional Technical Service Providers will be engaged at a regional level by the REE to ensure the coordination, compatibility, facilitate oversight, reporting and comparative assessment of the different approaches proposed by each country. Besides their specific services, they will all support the knowledge management activities at the regional level. These service providers include:

? **Zero Discharge of Hazardous Chemicals (ZDHC)** services related to chemicals management**, d**evelopment of techniques, standards and certification for chemicals, water and waste management in the TG sector

? **ICLEI Africa:** services related to CE policy and legislation in the continent.

? **Sustainable Fashion Academy (SFA):** services related to the development of relevant toolkits, ToT on sustainable apparel and development of business cases for supply chain management and circular economy.

Partners who will support the knowledge management activities as detailed in the Regional Knowledge Management plan**:**

? **African Development Bank (AfDB) Fashionomics Africa and African Circular Economy Alliance**

? **The German Corporation for International Cooperation (GIZ)**

? **International Labour Organization: Brands:** ASOS and others to be later join during the implementation of the full project phase. .

Coordination with ongoing initiatives

The relevant baseline projects and initiatives are presented earlier (Section A3.3 Associated Baseline Projects). Coordination with these other initiatives is done through a combination of a) co-financing partnerships, ?b) the?knowledge management component and c) regional SC meeting and National Working Groups. The coordination will include information sharing and exchange of experience with other initiatives; joint actions, particularly in the Global Knowledge Management output to ensure engagement of global brands and private sector initiatives. Please also refer to the?Stakeholder Engagement Plan?for details on modalities to engage partners from these projects.?

In addition to these, the project will coordinate with three GEF projects which overlap in some way with the current project. These are the following:

- UNEP textiles project in Asia (GEF ID 10523, ?Reducing uses and releases of chemicals of concern, including Persistent Organic Pollutants (POPs), in the textiles sector), with which there is a shared global KM output (see Output 4.2) which overlaps with UNEP?s Output 3.2 and includes: common KM strategy development (see Appendix 3); cost sharing for the implementation of the KM activities; and South-South global meeting of partners from the two projects.

- Conservation International MSP on fashion (GEF ID 10658, ?Transforming the Fashion Sector to Drive Positive Outcomes for Biodiversity, Climate, and Oceans?), with which a coordination call was held during the PPG and has identified sharing of information and pilot project results with the Fashion Pact initiative. CI and/or partners from the Fashion Pact will participate in the Global KM Advisory Group to ensure coordination continues throughout the duration of the projects.

- UNIDO?s Global Cleantech Innovation Programme (GCIP) in South Africa to support countries to accelerate the uptake and investment in cleantech innovations (GEF ID 10461), which aim to promote coordination, ecosystems connectivity and accelerate the uptake of, and investment in, innovative cleantech solutions under the Global Cleantech Innovation Programme.

Legal context

?It is expected that each set of activities to be implemented in the target countries will be governed by the provisions of the Standard Basic Cooperation Agreement concluded between the Government of the recipient country concerned and UNIDO or ? in the absence of such an agreement ? by one of the following: (i) the Standard Basic Assistance Agreement concluded between the recipient country and UNDP, (ii) the Technical Assistance Agreements concluded between the recipient country and the United Nations and specialized agencies, or (iii) the Basic Terms and Conditions Governing UNIDO Projects.?

?The Kingdom of Lesotho agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 31 December 1974 and entered into force on 17 December 1976.?

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?The Government of the Republic of Madagascar agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 19 March 1991 and entered into force on 14 April 1992.?

?The Government of the Republic of South Africa agrees to apply to the present project, mutatis mutandis, the provisions of the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government, signed on 3 October 1994.?

Transfer of assets

Full or partial ownership of equipment/assets purchased under the project may be transferred to national counterparts and/or project beneficiaries during the project implementation as deemed appropriate by the government counterpart in consultation with the UNIDO Project Manager.

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

The government of the three participating countries are receptive to new global initiatives and development trends and ready to transition their economy from a linear one to a circular one. A number of recycling and reuse activities and business are currently ongoing in these countries but however there is a lack of policy and regulatory framework, business model and -nancial mechanism to unlock the CE potential in the industrial sector.

Lesotho

The TG sector has been identi-ed as priority for the reduction of uPOPs emissions from open burning operation in accordance with the National Implementation Plan (NIP) of the Stockholm Convention (SC) on POPs, 2005 and National Implementation Plan (NIP) Update of the Stockholm Convention (SC) on POPs, Moreover, the TG sector is highlighted as a strategic sector for economic development and poverty reduction as in the National Strategic Development Plan, 2012-2017, National Vision 2020, 2003 and Poverty Reduction Strategy 2004 - 2007.

The project will complement and build on current Environmental policies to reduce emissions and protect the environment such as

- National Environmental Policy, 1996. Revised in 1998.
- National Climate Change Policy, 2017 - 2027.
- Lesotho?s National Adaptation Programme of Action (NAPA) on climate change, under the United
- Nations Framework Convention on Climate Change, GEF, 2007.
- Nationally Determined Contribution under the UNFCDD, 2017.
- National health strategic plan 2017 ? 2022

Through engaging private sector and developing business models and -nancing mechanisms for sustainability of TG wastes recycling and reuse operations, the project will align with the country strategies and policies encouraging investment such as:

- Medium-term debt management strategy, 2018.
- Fiscal policy for 1999 - 2000 and beyond.

- Transport infrastructure and connectivity project (TICP), 2017.
- National Investment Policy of Lesotho, 2015.

This project will deliver training, capacity building and dissemination of technical successes and lessons to the wider textile sector and society via national capacity and awareness raising activities and materials, including ensuring access to information and public education, aligning with Lesotho?s ICT Policy for Lesotho, 2005, Communications Policy 2008. And Education Sector Plan 2016?2026.

Madagascar

BAT/ BEP principles are a main strategic objective of the NIP for the implementation of the SC in Madagascar (page 14 of NIP, on National Priorities and National objectives on POPs management). The Textile and Garment sector is one of the priority sectors identi-ed in the industrial policy of Madagascar and one of the priority lines set in the NIP to reduce POPs impact on human health and environment, in particular the possible PFOS import and use in textiles (National Implementation Plan (NIP) of the Stockholm Convention (SC) on POPs, 2008 and National Implementation Plan (NIP) Update of the Stockholm Convention (SC) on POPs, 2017).
The project will complement and build on current Environmental policies to reduce emissions and protect the environment such as

- National Pollution Management Strategy, 2017.
- National Policy for Medical Waste Management and Injection Safety in Madagascar, 2014.
- General State Policy, 2018.
- National Action Plan for Adaptation to Climate Change, 2006.
- Madagascar?s National Adaptation Programme of Action (NAPA) on climate change, under the United
- Nations Framework Convention on Climate Change, World Bank and GEF, 2006.
- National Biodiversity and Action Plans, 2015 - 2025.
- New Energy Policy (NEP), 2015.
- Environmental Program for Sustainable Development, August 2016.
- National plan for the management of medical waste in Madagascar, 2014 ? 2018.

The project will provide training, capacity building and dissemination of technical successes and lessons to the wider textile sector and society via national capacity and awareness raising activities and materials, including ensuring access to information and public education, aligning with Madagascar?s National Strategy for Information and Environmental Communication for Sustainable Development, 2016.

South Africa

The TG sector has been identi-ed as priority for the reduction of uPOPs emissions from open burning operation in accordance with the National Implementation Plan (NIP) of the Stockholm Convention (SC) on POPs, 2012 and the National Implementation Plan (NIP) Update of the Stockholm Convention on Persistent Organic Pollutants (POPs), 2020.
The project will complement and build on current Environmental policies to reduce emissions and protect the environment such as:

- White Paper on Integrated Pollution and Waste Management for South Africa, (March, 2000)
- The National Waste Management Strategy
- National Environmental Management Act, 1998 (Act 107 of 1998)
- National Water Act, 1998 (Act 36 of 1998)
- National Waste Management Bill (December, 2007)
- Environment Conservation Act 1989, (Act 73 of 1989)
- Health Act, 1977 (Act 63 of 1977)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- Municipal Structures Act, 1998 (Act 117 of 1998)

- Municipal Systems Act, 2000 (Act 32 of 2000)
- Hazardous Substances Act, 1973 (Act 15 of 1973)
- Occupational Health and Safety Act, 1993 (Act 85 of 1993)

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

Three GEF funded projects in Asia & Africa are being developed to address chemicals and waste in the textile sector, namely a project implemented by UNIDO in Africa (GEF 10683) and one implemented by UNEP in Asia (GEF ID 10523). All three projects include technical and substantive components on phasing out POPs and Chemicals of Concern (CoCs), and promoting sustainable waste management and recycling of textiles. Both projects also include components on knowledge management at both national/ regional level, and at global level. The two Implementing Agencies and the participating countries have agreed to cooperate on the global KM to maximize the reach and influence of the two projects on the global fashion, textiles and garments sector.

The global Knowledge Management (KM) strategy will support the overall project objectives in the first steps towards a circular economy in the textiles and garment industry by phasing out hazardous chemicals use and promoting sustainable waste management. The focus of the global strategy lies on the coordination between global buyers, global suppliers, and governments. In this document, the global knowledge management strategy on chemical use and waste management in the textiles and garment sector is described.

National and regional knowledge management and awareness raising will additionally and separately be developed by each project. The Regional knowledge management plan (**Appendix 4**) was developed to build on existing efforts already present in the continent and coordinate between governments, suppliers, brands, manufactures, service providers, educational institutions, financers, associations and buyers. The plan will focus on stimulating regional integration, intra-African trade, entrepreneurship development, forging alliances/partnerships and bringing together tangible examples/case studies of what people are doing to put the circular economy into practice across Africa in the TG sector.

The three GEF project documents will describe the individual project outputs and activities for national and regional capacity and knowledge management (see UNIDO output 4.1.2 and UNEP output 3.2), while ensuring maximum alignment with the present global KM strategy (see Figure **13**below). The knowledge generated during each of the projects will be compiled in the respective regional knowledge hubs (Asia Garment Hub and Fashionomics Africa/African Circular Economy Alliance). As these platforms are digital libraries for the existing initiatives, tools, websites, hubs, and resources, the projects will further complement them. Under output 3.1, the project will develop communication and awareness raising strategies, including information materials for different audiences, and develop and deliver training. All awareness campaigns will be monitored by NGOs and other civil society organizations to ensure diverse voices and messages.

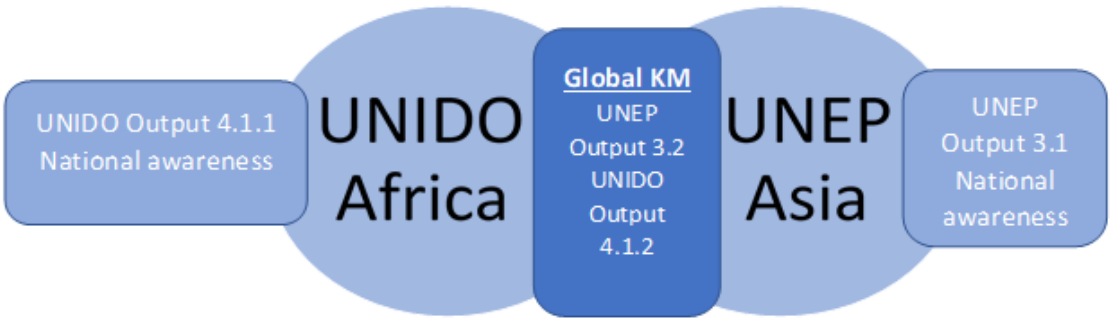


Figure 13: Visual representation of the different levels of knowledge strategies and awareness raising in both the UNEP and UNIDO projects.

The shared global knowledge management component will be coordinated by the NRDC for both projects as the global strategy?s KM Manager. Resources will be shared between the UNIDO and UNEP projects and both will be able to directly pass funds to the NRDC. The project?s Executing Agency (BCRC Indonesia) will provide a liaison with the project countries and ensure representation and inclusion of national knowledge and knowledge networks. Furthermore, support will be provided from UNEP?s communication division.

The global strategy will support the overall project objectives in the first steps towards a circular economy in the TG industry by phasing out the use of hazardous chemicals. Global brands are expanding on their sustainability initiatives and numerous knowledge platforms and information sources on chemical use in the TG industry exist. However, multiple knowledge gaps remain with global buyers (value chain mapping, absence of comprehensive requirements, demands of multiple certifications etc.), governments (chemical use, gaps in regulatory framework, enforcement capacity, etc.), and global suppliers (technical capacity, internal knowledge, uncomplete supplier inventories, etc.). This has been described in detail in section A3.2 on Root Causes and Barriers. Therefore, the focus of the project lies on these global stakeholders and their coordination.

A global knowledge platform will host a database of developed knowledge (best practices, case studies, guidance etc.) and multimedia by both projects. The choice of platform will be decided during the project inception phase but the GGKP (Green Growth Knowledge Platform), the SAICM Platform, the Asia Garment Hub, and Fashionomics Africa and African Circular Economy Alliance (ACEA) platform were identified to connect well. Global stakeholders will attend global industry events and meetings for coordination and exchange. Global buyers will be engaged to incorporate pollution targets into their corporate strategies, and have access to best practices, tools, and guidance to ensure control over their supply chains. Global suppliers will be supported on reporting, monitoring and sharing data to brands and governments so that transparency, accountability and compliance is increased in the sector. Governments will have access to, and be able to share, BAT/BEP and guidance documents on policies, regulations, enforcement and reporting related to chemical use in the sector. Furthermore, researchers and sustainable fashion and TG experts will share technology, tools, and policy developments alongside advice to industry, brand and government needs and gaps.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis???vis project monitoring and evaluation. Indicators and their means of verification may also be fine?tuned at the inception workshop. Day?to?day project monitoring is the responsibility of the project management team but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UNIDO of any delays or difficulties faced during implementation so that the appropriate support or correlative measures can be adopted in a timely fashion.

The project Steering Committee (for both projects GEF ID 10543 regional and GEF ID 10683 in Ethiopia) will receive periodic reports on progress and will make recommendations to UNIDO concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNIDO and GEF policies and procedures is the responsibility to UNIDO?s Manager.

In line with the GEF Evaluation requirements and UNIDO?s Evaluation Policy, GEF Full-Sized Projects and any project with a duration of 4 years or more will be subject to an independent Mid-Term Review at mid-point. All GEF funded projects are subject to a performance assessment when they reach operational completion. This performance assessment will be in the form of an external Terminal Evaluation (TE).

The TE will provide an independent assessment of project performance (in terms of relevance, effectiveness and efficiency), and determine the likelihood of impact and sustainability. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among UNIDO staff and implementing partners. The direct costs of the evaluation will be charged against the project evaluation budget. The TE will typically be initiated 3-6 months prior to project completion.

The M&E plan is presented in the table below (Table **7**).

Table 7: M&E Plan

Type of M&E activity	Responsible Parties	Budget from GEF	Time Frame
Inception Meeting	REE &NEEs	Incl in SC meetings	Within 2 months of project start-up
Inception Report	REE&NEEs	80,000	1 month after project inception meeting
Ongoing monitoring (project execution, Monitoring Specialist)	REE&NEEs		Ongoing (5 years)
Baseline measurement of project outcome indicators, GEF Core indicators	REE&NEEs		Project inception
Quarterly reports	REE&NEEs	0	Within 1 month of the end of reporting period i.e. on or before 31 January and 31 July
Project Steering Committee (PSC) meetings and report	REE	50,000	Once a year minimum
Project Implementation Committees (PICs) meetings and reports	NEEs	10,000	Annually

Project Implementation Review (PIR) report	REE, NEEs and UNIDO	0	Annually, part of reporting routine
Technical Committees Meetings	NEE	10,000	Annually
Stakeholders Mobilization workshop	REE&NEEs	10,000	Annually
Stakeholders Engagement workshop	REE&NEEs	10,000	Annually
Monitoring visits to field sites	REE, NEEs and UNIDO	20,000	As appropriate
Mid Term Review/Evaluation	UNIDO	50,000	At mid-point of project implementation
Terminal Review/Evaluation	UNIDO	60,000	Typically initiated after the project?s operational completion
Project Operational Completion Report	REE and NEEs	Included in Project regional and national Coordinator budget	Within 2 months of the project completion date
Co-financing report (including supporting evidence for in-kind co-finance)	REE and NEEs		Within 1 month of the PIR reporting period, i.e. on or before 31 July
Publication of Lessons Learnt and other project documents	The NRDC and REE		Annually, part of Semi-annual reports & Project Final Report

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

As described in section A2 (Global Environmental Problem), and section A7 (Global Environmental Benefits), hazardous chemicals and wastes are released all along the TG value chain and expose TG workers, local communities and consumers. The contamination migrates offsite from the facilities through workers, the facilities? effluents and emissions (wastewater and uPOPs), the use of TG products, their disposal and as recycled products, into the local and global environment. Through the project interventions, workers in the textile sector will be directly supported by a reduction of exposure to hazardous chemicals with initial safety measures (at least 15 facilities) and pilot projects (at least 4) that substitute or remove hazardous chemicals in the facilities? processes. Reduced exposure will lead to increased productivity, as health impacts are avoided.

The implementation of eco-innovation pilots will also deliver socioeconomic benefits. Indirectly, these pilots and interventions are expected to bring much higher socio-economic benefits to the millions of other workers in the TG sector, through a combination of demonstrating the feasibility and preferability of the reduction of hazardous chemical use, a gradual shift in perception about the risk and dangers (environmental, social and health) of continuing to work with these chemicals. Broadly, the project will result in the creation of jobs within the circular economy and encourage enterprises operating within the circular TG economy to hire more workers, conduct product innovation and ensure resilience of business models during a transition to the circular economy. First, companies will hire more workers. Secondly, product and service innovation will allow consumers to make more informed choices about their consumption of clothing and alternatives. The support for market making activities such as the promotion of POPs alternatives and the adoption of circular economy standards for wastes management provides further opportunities to afford consumers a more sustainable consumption choice.
Under Component 3, Socio-economic impact assessment of project intervention will be carry out on the TG sector and value addition to national economy. The assessment will include the social impacts (e.g.

health), economic impacts (can include effects on employment and jobs creation), new investments, economic growth and environmental impacts

Thus, a combination of enforcement of regulations, scalable pilots and interventions, awareness raising, engagement with many different value chain stakeholders, and the increasing availability of alternatives, is expected to contribute to large scale shifts in governments, SMEs, global suppliers, global buyers, and other stakeholders? decisions, which will also support global environmental objectives.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
	Medium/Moderate		

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

As per UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), the project has been categorized as ?B?. Category B projects are likely to have less adverse impacts on human populations or environmentally important areas than those of Category A projects. As a result, an Environmental and Social Management Plan (ESMP) was developed during the PPG (Annex J).

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
10543_Annex J_ESMP	CEO Endorsement ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Project Strategy	KPIs/Indicat or	UNIDO IRFP Indicator	**Baseline**	**Target (for the entire project duration)**	**Means of Verificatio n**	**Assumpt ions**

Objective: To promote the concept of circular economy (CE) in the textile and garment (TG) sector of Lesotho, Madagascar and South Africa through the reuse, recycling and conversion of textile/garment discards and related wastes into economically viable and socially beneficial products and services.	# Regulatory and legal initiatives for promoting CE in the sector implemented # Firms with improved chemicals and wastes management # Pilot demonstrations for Chemicals Management # Pilot demonstrations for wastes Management and CE # Institutional and technical capacity strengthened Number of direct beneficiaries reached (sex disaggregated)	**POL.1:** Cumulative number of new or revised policies adopted by policymakers **ENV.1:** Cumulative reduction of CO2eq emissions **ENV.2:** Cumulative tons of pollutants reduced or phased out **[KASA.2]:** Number of research/training institutions in CE financing mechanisms strengthened **[NOO.1]:** Number of initiatives to promote sustainable TG supply chains with increased transparency designed **IRPF 2.22** (gender-responsiveness marker): Number of new/updated policies adopted by policymakers as a result of UNIDO	Some bassline projects in POPs but none in CE	>3 Legal and institutional framework to promote CE, BAT/BEP/RECP 5.5 tons PFOS/ PFOA /PFAS/ PFHxS 4,000 tons POPs contaminated wastes 11.5 grams of toxic equivalent of emission of POPs to air mitigated >70 with improved Chemical management practices >1 research center with strengthened training capacity on CE > 6 CE/recycling pilot demonstrations, business and financial models, quality assurance and standardization 8,000 direct	Inception report, mid-term review, and terminal evaluation	Key stakeholders along the value chain will actively participate in all project activities

Component 1. Strengthening of regulatory and institutional capacities for adoption and promotion of Circular Economy in the textile and garment (TG) sector.

Outcome 1. Strengthened regulatory and institutional framework and capacities for adoption of Circular Economy in the TG sector	#Policy and regulatory framework for CE in the TG sector is developed / accepted among governmental stakeholders and private sector # new or amended policies and legislation relevant to chemical and wastes management and CE % of women and men in circular economy and TG policymaking organs/structures	**POL.1:** Cumulative number of new or revised policies adopted by policymakers **POL.2:** Cumulative number of new standards adopted or implemented **POL. 3:** Number of policies, policy instruments, or regulatory frameworks with contributions from the project for chemical and waste management and CE at national/local level developed **GOV.1:** Number of institutions established or strengthened **IRPF 2.22** (gender-responsiveness marker): Number of new/updated policies adopted by policymakers as a result of UNIDO **KASA.1:** Number of actors gaining awareness/knowledge on the policy **TCO.1**: Number of capacity building	Policy, regulatory, and financial environments do not provide incentives for the phase out of POPs and CoCs No specific regulatory framework for circular economy in the TG sector	>3 Legal and institutional framework to promote CE, BAT/BEP/RECP 3 CE technical committees	Progress report Meeting reports	Key stakeholders will actively participate in the process of regulatory improvement. Governments are committed to examine and endorse studies, draft legislation and other institutional arrangements developed under the project within the project timeframe.

Output 1.1. Legal and institutional framework for life cycle manageme nt of the TG supply/valu e chains.	# Policy and regulatory framework for CE and toxic-free in the TG sector is developed / accepted # Implementation of EPR programmes #Standards developed/adapte d in each country for POPs/hazardous chemicals/waste management and CE in the TG sector # Laboratories testing and analytical capacities Strengthen % of women and men in CE and TG policymaking organs/structures	Above	Policies and strategies to support programmes and activities for life circle management do not exit. Testing and analytical capacity needs strengthening	3 revised legal framework (one in each country) to promote CE and including technical infrastructure for implementati on of BAT/ BEP on POPs, hazardous chemicals, and textile waste management as well as RECP options >6 capacity building and awareness raising events conducted >6 local Laboratories certified by ZDHC	Policy document prepared and endorsed by relevant authorities Training reports, minutes, and training support material on BAT/BEP/ RECP and CE capacity building processes	Governm ent officials are interested and able to promote CE in the sector

Output 1.2. Regulations and incentive scheme for promotion and sustainability of circular economy in the TG sector.	# Targets and incentives are set, promoted, and enforced #Master plan for national strategy for transition to CE is developed	Above	Regulations and incentives scheme for the promotion of circular economy are not in place There is not adequate national master plan and strategy on circular economy	3 Regulations and incentive scheme (one in each country) > 6 capacity building events conducted for incentive scheme 3 Master plans for transition to CE	Regulations and incentives scheme document Master plan documents for transition to CE Training reports, minutes of meetings	Government officials are interested and able to promote CE in the sector stakeholders will actively participate in the process of regulatory improvement.
Output 1.3. Technical Committee for Circular Economy in the TG sector	Technical Committee on Circular Economy established and operational	GOV.1: Number of institutions established or strengthened	A formal government organization/committee for supporting a circular TG economy is non existent	3 workplan and Coordination mechanism (one for each country) 6 targeted trainings 5 annual Reports and recommendations of the Committee 50% women participation in the committee	Binding documents, list of committee members and signatures Meetings, number of trainings conducted Reports and evidence based policies TOR prepared and Committee members selected Committee reports, minutes of meetings	Government officials are interested and able to promote CE in the sector Multisectoral participation in the committee
Component 2. Recyclability of textile and garment wastes is enhanced through POPs-free textile manufacturing process and the implementation of BAT/BEP and RECP investments.						

Outcome 2. BAT/BEP/ RECP and Circular Economy concept are implemented through technical assistance in selected textile production facilities for the ESM and prevention / reduction of POPs, hazardous chemicals and wastes while improving process efficiency and profitability at plant level.	Amount of POPs chemical and contaminated wastes phased out # Entities/People trained (total) # men and women who participate in capacity building programmes # Facilities participating in the ESM	**ENV.2:** Cumulative tons of pollutants reduced or phased out **ENV.5:** Number of new or improved green products made available or used **[TEC.3]** Number of pilot projects implemented and operationalized in the selected companies **[KASA.1]** Number of actors gaining awareness/knowledge on POPs-free technologies **TCO.1:** Number of capacity building activities provided **POL.2:** Cumulative number of new standards adopted or implemented	No ESM of POPs hazardous chemicals and wastes	5.5 tons of POPs phased out 4,000 POPs contaminated wastes eliminated > 70 entities with improved knowledge on chemical management and improved Chemical management practices 3,000 actors (50% women) gaining knowledge >3 technical guidelines and SOPs on sustainable chemical management	Progress reports Inception report, mid-term review, and terminal evaluation Reports submitted by service providers, local and international experts working in the sector in coordination with the project Progress reports	Stakeholders are able and willing to participate in awareness raising/capacity building on Chemical management Chemical providers are interested in sustainable Chemical management TG sector companies and chemical providers are willing to share information on chemical use

Output 2.1. Chemical Inventories for POPs and Technical guidelines for environmental sound management of POPs chemicals and wastes	Inventory, database, and material flow analysis (MFA) prepared #Technical guidance developed # Factory Implementation and adoption of ZDHC tools/ relevant methodologies #Capacity building and institutional strengthening on sustainable chemicals management system #People trained (total) #men and women who participate in capacity building programmes % of enterprises complying to new inclusive and legal measures	**POL.2:** Cumulative number of new standards adopted or implemented **TCO.1:** Number of capacity building activities provided	Lack of data and inventories of Chemicals use No available guidelines	Inventories prepared >3 Technical guidelines on Chemical management to participating TG production facilities >15 pilot demonstration facilities implemented ZDHC tools >6 capacity building events conducted >100 people gained knowledge on sustainable chemical management through ZDHC trainings	Inventories Reports and Draft and final version of the Technical guidelines Training reports, minutes and training support material for technical assistance, and advisory processes Training reports, minutes and training support material for technical assistance, and advisory processes	TG sector companies and chemical providers are willing to share information on chemical use Stakeholders are able and willing to participate in awareness raising/capacity building on Chemical management

Output 2.2. Standard operating procedures (SOPs) and checklists POPs pollution prevention and control	# of SOPs developed and implemented in the facilities BAT/BET options on POPs and hazardous chemicals identified #Pilot facilities are audited # Business models for sustainable chemicals management developed.	**POL.2:** Cumulative number of new standards adopted or implemented	No SOPs for handling and usage of chemicals and auxiliaries in the textile production process No access to POPs free and non hazardous alternatives and technologies	> 3 SOPs for chemical management, RECP, BAT/BEP. >15 Assessment report on the identified BAT/BEP/RECP options >15 of facilities audited for RECP and ESTs > 2 business opportunity developed (incl. Chemical Leasing). >500 training participants on SOPs , BAT/BEP/RECP (male and female) > 800 raining participants on New Business models (male and female)	Draft and final version of the SOP documents Assessment report Facilities audit reports Training reports and lists of attendance	Key stakeholders will actively participate in the process

Output 2.3. Techno-economic feasibility of BAT/BEP and RECP options	Technical assessment and feasibility carried out		No technical assessment and feasibility study with cost-benefit analysis, economic and market conditions	3 Techno-economic feasibility assessment reports	Reports, progress reports, findings, and recommendations	Key stakeholders will actively participate in the process
Output 2.4: Training and Capacity building in BAT/BEP, RECP and Circular Economy.	#Capacity building and awareness raising programmes on chemicals and wastes BAT/BEP/RECP and CE #training guidelines, modules, and manuals developed by ZDHC service providers #People trained (total) # men and women who participate in capacity building programmes % of enterprises complying to new inclusive and legal measures	**[TCO.1]:** Number of capacity building events conducted for relevant stakeholders	Limited technical capacity in BAT/BEP, RECP and CE	>6 Capacity building programmes > 9 training guidelines, modules, and manuals (>3 per country) 2000 training participants (male and female)	Training reports and minutes of meeting Service providers progress reports training guidelines, modules, and manuals	Key stakeholders will actively participate in the process Service providers accredited by ZDHC are available in the region

Output 2.5: BAT/BEP and RECP options identified and implemented in at least one facility for each country.	# Factory Implementation In-plant assessment and training programmes # of participants (sex disaggregated) Socio-economic impact assessment	**TEC.1:** Number of new technologies developed or adapted **TEC.3:** Number of new technologies adopted **ENV.5:** Number of new or improved green products made available or used		>15 pilot facilities that adapt new technologies > 15 In-plant assessment and training programmes 150 In-plant personnel trained (female and male)	Inspection, Progress and assessment reports. Training reports	
Component 3. Introduction of Circular Economy concept for UPOPs emission reductions and contaminated land mitigation through ESM of textile and garment wastes and pilot demonstration of textiles/garment wastes recycling and reuse.						

Outcome 3. BAT/ BEP and Circular Economy concept are implemented through technical assistance in selected TG and recycling facilities for the reuse, recycling and ESM of textile and garment wastes.	uPOPs emission reduction Reduction of waste generation Amount of wastes recycled/reused GHG mitigated	**ECO.1:** Number of firms with economic gains (additional sales, savings) **ENV.1:** Cumulative reduction of CO2eq emissions **ENV.2:** Cumulative tons of pollutants reduced or phased out **ENV.5:** Number of new or improved green products made available or used **[INV.1]** Number of financial mechanisms developed, influenced, or supported **[TEC.3]** Number of pilot projects implemented and operationalized **[KASA.1]:** Number of actors gaining awareness/knowledge on CE **[KASA.2]:** Number of research/training institutions in CE strengthened	Open burning leading to uPOPs and GHGs emission Lack of /unsustainable waste management practices	>3 pilot projects implemented and operationalized in each country to reduce and/or eliminate POPs 11.5 grams of toxic equivalent of emission of POPs to air mitigated 1000 workers, policy makers, relevant stakeholders (500 women and 500 men) trained in CE 2000 actors (1,200 women and 800 men) gaining awareness/knowledge on waste management and CE > 2 financial mechanisms and business models developed, influenced, or supported >1 training institutions in CE strengthened to include CE in its curricula and carry out Training the trainer (ToT).	Progress reports Training reports, minutes and training support material for technical assistance and advisory processes	TG cooperatives/individual workers are willing and able to implement changes in TG value chain Policy makers are committed to promoting CE

Output 3.1. Environmentally sound management (ESM) plan for textile/garment wastes.	# Textile and garment wastes mapping in each country #ESM plans interregional wastes flow/trade assessment	**[TCO.4]:** Number of plans to improve processing technologies developed	None	3 waste mapping reports one for each country >3 plans to improve waste management practices developed 1 Assessment of interregional wastes flow/trade report	Progress reports Draft and final ESM plan Draft and final of waste trade report	Government officials (Ministry of industry, Environment, Statics office, etc.) , TG facilities and TG wastes relevant stakeholders are willing to share data and participate in developing a new plan
Output 3.2. Training and capacity building in ISWM and BAT/BEP for ESM of textile and garment wastes.	# training materials and technical guidelines #trainings and building capacity	**TCO.1:** Number of capacity building activities provided	None	>3 training materials and technical guidelines on BAT/BEP for ESM of textile and garment wastes/discards > 6 trainings and building capacity events on BAT/BEP for ESM of textile and garment wastes/discards	Draft and final documents of training materials and technical guidelines Training reports and list of participants (sex disaggregated)	There is interest from the private sector and relevant stakeholders to implement the new ESP plan

Output 3.3. Financing mechanisms and business models for circular economy.	Review of the global Innovative Business Practices and Economic Models in the TG Value Chain # Business models and financing mechanisms for sustainability of TG wastes # Entrepreneurship Scheme for sustainable TG wastes recycling and management # Access to PFAN services to mobilize private sector financing	**[INV.1]:** Number of financial mechanisms developed, influenced, or supported **[KASA.1]:** Number of actors gaining awareness/knowledge on access to finance and responsible supply chains **[KASA.2]:** Number of research/training institutions in CE financing mechanisms strengthened	None PFAN network in the region but no in the TG sector	>2 financial mechanisms and business models developed, influenced, or supported 1500 actors (women and men) gaining awareness/knowledge on access to finance and responsible supply chains >2capacity building events .1 research institutions on CE financing mechanisms strengthened >50 access/use PFAN services	Progress reports	Stakeholders are able and willing to participate in awareness raising/capacity building on access to finance Financial institutions are interested in developing and implementing adequate financial mechanisms for TG wastes valorization
Output 3.4: Techno-economic feasibility study of BAT/BEP options for recycling/reuse of textile and garment wastes.	Technical assessment and feasibility carried out	**[TEC.1]:** Number of new technologies developed or adapted	No technical assessment and feasibility study with cost-benefit analysis, economic and market conditions	>3 Techno-economic feasibility assessment reports	Reports, progress reports, findings, and recommendations	Key stakeholders will actively participate in the process

Output 3.5: Socio-economic impact assessment of project interventio n	Review of the socio-economic impacts of different sustainable economic models in the TG value chain Socio-economic impact assessment of the project intervention			1 Review report of Socio-economic impact of TG sustainable economic models >3 Socio-economic impact assessment reports	Reports, progress reports, findings, and recommend ations	Key stakeholders will actively participate in the process
Output 3.6: Partnership and cooperation mechanism supply chain manageme nt	Mapping of the African TG sector Identify TG waste generation/collec tion hub/cluster #national strategy for the TG supply chain management Training on Brands and global requirements/stan dards # Partnerships signed	[PAO.1] Number of analytical reports on TG supply chain in Africa produced **TCO.1:** Number of capacity building activities provided REA.2: Number of actors engaged (by kind of actor)	None	>1 Waste mapping report including wastes clusters >3 national strategy for the TG supply chain management document Training reports > 3 regional and/or global partnerships/ cooperation agreements signed		

Output 3.7: BAT/BEP demonstration for ESM of POPs chemicals and textile/garment wastes	# investment intervention in pilot facilities # of projects linked to	**[NOO.1]:** Number of initiatives to promote sustainable TG supply chains with increased transparency designed **[TEC.3]:** Number of new technologies adopted **[ENV.5]:** Number of new or improved green products made available or used		>3 Waste management and CE initiatives with technology/equipment transfer (one in each country)		
Component 4. Knowledge management for scaling up						

Outcome 4. Upscaling of project results to global textile and garment sectors and reporting to MEAs	# National capacity and awareness #Regional and Global Knowledge events #Regional and Global Exchange and Management tools produced # specific knowledge material developed on gender # gender references ininformation/knowledge material produced	**[KASA.1]:** Number of actors gaining awareness/knowledge **[REA.1]:** Number of people reached with awareness raising materials, by mode of communication (e.g. online, in-person, via SMS, WhatsApp, etc) and by gender **[KASA.2]:** Number of research/training institutions in CE strengthened	None	3,010 actors (1,600 women and 1,410 men) gaining awareness/knowledge on the dangers of POPs and ways to avoid/eliminate its use 100,000 (50,000 women and 50,000 men) reached with awareness raising materials At least 2 South- South Global events with UNEP Asia project 10 original publications (blogs, news articles, events, etc.) on the communication platforms 2 research/training institutions in CE	Progress reports Metrics on communication outreach Blogs, news articles, events, or other publications available on the website	There is interest, participation, and involvement of the different stakeholders

Output 4.1. National capacity and awareness programs developed and implemented to increase ability of textile sector and policy makers to control POPs and CoCs	National KM and awareness plan for each country # Awareness and capacity building training as per the plan # of research/training institutions to develop training modules and teaching resources # gender references in information/knowledge material produced	**[CPO.1]:** Number of events related to chemical management and CE in the TG at national level organized **[KASA.2]:** Number of research/training institutions in CE strengthened **[TCO.3]:** Number of courses developed in academic units	0	1 KM plan to develop a sustainable exchange mechanism for the TG sector in each country At least 3 awareness and capacity building trainings per country 1 research/training institution in CE > 1 training modules and teaching resources per country	Progress reports Documents approved by the Ministry of Education	There is sufficient technical and financial support to build the sustainable exchange mechanism Academic and educational conditions are created to implement qualification programmes at professional level
Output 4.2. Regional and Global Knowledge Exchange and Management tools produced and accessed by users globally	Global KM strategy Connecting to an online Platform Regional KM plan Number of original publications (blogs, news articles, events, photo essays, videos, etc.) on digital communication platforms	**[TCO.4]:** Number of plans/strategy to develop a sustainable exchange mechanism for the TG sector hosted by a local partner developed **[CPO.1]:** Number of events related to chemical management and CE in the TG at regional and global level organized		> 2 South ? South Meeting with UNEP 5 Advisory Group meetings >5 Regional industry events in collaboration with AfDB > 6 original publications for each country (Policy, chemical, wastes mapping, waste management, CE, etc.)	Meeting reports Draft and final original publications	There is sufficient technical and financial support from local, regional, and global partners to build the sustainable exchange mechanism Pilot experiences generate relevant lessons learned to be disseminated and replicated Links with the media are generated

Output 4.3. Gender and Social Action Plan implemented, and benefits accrued to women workers	# National stakeholder workshops to confirm and validate the project wide Gender and Social Action plan. Gender assessment of the key project outcomes and reports, # Gender-specific training for women workers who may be exposed to hazardous chemicals.	**[TCO.1]:** Number of capacity building events organized **[CPO.1]** Number of physical/virtual regional events for women workers organized		> 3 National stakeholder workshops to confirm the Gender plan 3 Gender assessment reports of all project activities. > 5 physical/virtual regional events for women workers organized	Detailed national work plan Training reports Meetings reports Asses all reports across all component developed and integrated with inclusiveness and gender responsiveness	Women workers are engaged General public has an interest on gender aspects in TG sector

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Annex B in available in a proper format as an attachment to the CEO document.

Annex B: Addressed comments from STAP, the United States, Japan and Germany		
Comments from the STAP **General response: We thank the STAP for the thorough review. The specific comments will help to further strengthen the full design of the program. Please see below our response to each of the comments.** **STAP requests that the following requirements are taken into account during the development of a similar project in Ethiopia (GEF ID 10683) and the design of the final project proposal for both this project and Ethiopia one:**		
Comments	**Response**	**Reference in documents**
STAP Comment 1 Table 1, pg 21, shows (in the PIF) that Mauritius is the largest exporter of apparel in Africa. Why is the country not included in the project as the leading exporter of apparel compared to the other targeted countries? Are there already ongoing projects in Mauritius? Paragraph 31 suggests that the challenge of recycling of textiles also exists in Mauritius and that the country presents an opportunity for delivering substantial global environment benefits. STAP recommends that this project should plan to include measures for the transfer of knowledge and experience from this project to Mauritius and other countries listed in Table 1.	Mauritius was initially included in the project together with Lesotho and Madagascar. Based on country assessment, Mauritius generated about 7,200 tonnes of textile and garment wastes and discards, out of which about 400 tonnes are recycled internally; 3,500 tonnes go to landfill and the remaining 3,300 tonnes are exported to South Africa for recycling purposes. There is no open burning of textile and garment wastes in Mauritius. Hence global environment benefits from uPOPs emission reduction cannot be established. The textile and garment sector in Mauritius is adopting global best practices in terms of chemicals and wastes management and application of clean technologies, best available techniques and best environmental practices. During the UNIDO assessment mission in March 2019 the use of POPs chemicals in the textile and garment sector could not be established. The volume of wastes generated and non-use of POPs chemicals in the TG sector does not offer considerable global environment benefits. There is some private sector initiative on textile/garment waste recycling already ongoing in Mauritius. In view of the presence of international brands such as Levi, ASOS and Puma in Mauritius, UNIDO still included	NA
	Mauritius in the project in order to replicate and upscale ongoing initiatives and facilitate information exchange and experience sharing with other participating countries. However, due to the lack of prompt response from the Government and private sector industries, Mauritius had to be dropped when the PIF was to be submitted to the GEF. The project will benefit from the expertise and skills in Mauritius by engaging the companies that work in Mauritius and across the project countries, such as Tropic Knits which works in both Madagascar and Mauritius.	
STAP Comment 2 Paragraph 47 indicates that a theory of change was included in Annex D. However, Annex D is missing. It is recommended that the theory of change should always be included in the body of the PIF. It will be useful to review the theory of change to ascertain that it accurately captures the essential components of a functional theory of change, including the underlying key assumptions, causal and alternative pathways, and expected outcomes.	The theory of exchange (Annex D) was uploaded on GEF portal and reviewed by the GEF	TOC is provided in the CEO endorsement document under A.4, with the proposed alternative scenario with a brief description of expected outcomes and components of the project.
STAP Comment 3 The PIF presents a list of interventions to achieve the project objective, but the details of the activities are quite vague. There is limited information on the type of planned interventions, for instance, examples of circular economy approaches or BAT/BEP or RECP that will be introduced. of financing mechanisms and business models that are being considered in the project. Besides, there are several terms used in PIF, e.g., green investment, green financing, green technologies, green industry, green products, which are not defined.	i) Circular economy approaches were listed under Section A4: The proposed alternative scenario. These include design out waste and pollution through waste minimization, resource efficiency and productivity improvement and extended durability of products. Removal and avoidance of harmful chemicals substances in products is to ensure the recyclability and reusability of wastes; hence keeping materials and products continuously in circulation. ii)BAT/BEP - The Stockholm Convention on persistent organic pollutants has developed the best available techniques and best environmental practices to address emission and pollution from POPs chemicals in some industries including the textile sector. This BAT/BEP will	More details of the activities were added under each output in Section A4: The proposed alternative scenario. The definitions were added under the global baseline, where appropriate.

	be applied to the textile sector as articulated in Component 2 of the project. iii)Resource Efficient and Cleaner Production methodologies have been developed by UNIDO and UNEP for a systemic approach to achieve resource efficiency, productivity improvement, waste minimization and pollution control in industries. These methodologies have been demonstrated by UNIDO and UNEP in many industrial sectors including textile industries. As already indicated in the CEO endorsement this will be implemented and will contribute to low carbon concept and "zero to landfill" approach of circular economy. The definitions are assumed to be widely known and as there are no global international definitions for each of these terms, they were not defined in the PIF. i)Green investments are investments in low carbon, resource efficient and non-polluting technologies for production of green products and services that are eco-friendly throughout their entire life cycles. ii)Green Financing – financing of green investments in processes, products and services iii)Green technologies – conserve raw materials and energy; reduce quality and/or toxicity of industrial processes' wastes and emissions; and produce products (and their packaging) that consume less materials and less energy during use; generate minimal emissions and wastes; and are more readily recoverable, reusable and recyclable, and have minimal negative impact if disposed into the environment. iv)Green product: less material input, non-toxic, non-polluting, less material and energy consumption during use; and easily recoverable, reusable, recyclable; and	

	with minimal negative impact on the environment after disposal. v)Green Industry promotes sustainable patterns of production and consumption i.e. patterns that are resource and energy efficient; low-carbon, low-waste, non-polluting and safe, and which produce products that are responsibly management throughout the entire life cycle.	
STAP Comment 4 Although component 3 is intended to focus on introducing circular economy concepts for uPOPs emissions reduction and contaminated land mitigation, no information is presented in the PIF on contaminated land mitigation. There is no baseline information on contaminated lands caused by textile production or recycling in the targeted countries or why this needs to be addressed. This makes it difficult to understand why an intervention on contaminated land is included in the project.	Mitigation of land contamination will be addressed through the recycling and reuse of textile discards and wastes that are currently being disposed of in open landfills, which are causing the land contamination. The project will not address contaminated land decontamination but avoid further decontamination through the diversion of wastes into recycling businesses.	Refer to component 3 in the CEO endorsement document
STAP Comment 5 Global Environmental Benefits: How are the estimates of POPs and uPOPs reduction presented on page 41 derived?	i. The preliminary estimates of the amount of waste in tons burned, incinerated or dumped in landfills in each of the countries is listed in below. The estimated UPOPs emission reduction is direct benefits. Indirect benefits will also be derived from resource efficiency and productivity improvement that will increase the economic competitiveness and profitability of the textile and garment sector companies and increase their outputs and reduce the volume of wastes generated. During the PPG phase a the amount of wastes generated, recycled, landfilled, open burnt and disposed will be thoroughly assessed and estimated. •Based on UNEP uPOPS emission toolkit for open burning of wastes operation, the uPOPs emission factor is 300 µg TEQ/ tons of wastes. For Lesotho, the emission is calculated as follows: (300 µg TEQ/ tons of wastes.) *13,880 tons of wastes= 4,164,000 µg TEQ/1,000,000= 4.164 g TEQ	More details under the Global Environmental Benefits:

Response to above comment

For Madagascar, the emission is calculated as follows: (300 ?g TEQ/ tons of wastes.) *7,000 tons of wastes= 2,100,000 ?g TEQ/1,000,000= 2.1 g TEQ

For South Africa, the emission is calculated as follows: (300 ?g TEQ/ tons of wastes.) *17,452 tons of wastes= 5,236,000 ?g TEQ/1,000,000= 5.236 g TEQ

Total: 11.5 grams of toxic equivalent gTEQ

ii.Metric tons of toxic chemicals reduced:
This is the estimated direct benefit, however indirect benefits will also be derived through information exchange and experience sharing with other industries and the co-financing to be mobilized by the Government and other counterparts.

iii. The greenhouse gas reduction benefits will be established when the detailed assessments and energy audits of the participating industries are carried, energy efficiency gains are estimated, and carbon emission reductions are calculated.

STAP Comment 6

Climate change impact and risks: It is essential to carry out an adequate assessment of proposed alternatives and approaches to ascertain that adopted solutions do not contribute to greenhouse gas emissions and other unintended consequences.

Response

The detailed climate risk screening were undertaken during the PPG phase in line with STAP guidance.

Reference

Refer to the risk section in the CEO endorsement, Annex J: Environmental and Social Management Plan and APPENDIX 2: Climate Risk Screening

STAP Comment 7

Innovation, sustainability, and potential for scaling-up: The PIF states that sustainability and scaling up of project activities will be achieved through information exchange and participation of the private sector in the project. More efforts, than information exchange, may be needed to scale up the project activities outside participating countries.

Response

This will not achieve by information exchange only but the active participation and involvement private sector and global brands/foundations/entities like the Cambridge University Circular Economy Center, Sustainable Fashion Academy (SFA), which has a large repository of information and knowledge on Circular Economy and has also developed a number of training toolkits and methodologies on CE and transformative change with other international partners. The project will use the knowledge, network and expertise of Zero Discharge of Hazardous Chemical (ZDHC), which will carry out certified training and capacity building programme on sustainable management of chemicals in industries. Already most of the global brands in the TG sector have signed up to the ZDHC programme. With the active involvement of both of ZDHC, the project was be able to mobilize and enlist the commitment brands like ASOS, etc, which will drive and realize the expected

transformational change. It should be noted that the innovative approach of this project is achieved through the active involvement of the private sector along the supply chain.

Reference

Refer to the Innovation, sustainability, and potential for scaling-up in the CEO endorsement.

<u>Comments from the United States</u>

The United States request that the following requirements are taken into account during the design of the final project proposal:

US Comment 1

Agree with the conclusions of the STAP review, that the interventions detailed to achieve the project objectives are vague, including on what types of circular economy approaches are intended.

Response

Addressed above

US Comment 2

This lack of clarity is particularly of concern where circular economy concepts are proposed for uPOPs emissions reduction and contaminated land mitigation. In our view, the goal of Component 3 (promoting the reuse and recycling of textile and garment wastes with the final objective of reusing and recycling 100% of wastes in the future in an environmentally sound manner) is concerning as written, and further, seems out of alignment with Output 3.1.2 (Training and capacity building in ISWM and BAT/BEP for ESM of textile and garment wastes). We request greater clarity on what wastes are envisioned for recycling, and what wastes are intended for integrated solid waste management (ISWM), as the recycling of certain uPoPs-contaminanted wastes should be avoided to protect human health. Additionally, the lack of background or baseline information on contaminated lands caused by textile production or recycling makes it difficult to understand why this intervention on contaminated land is included.

Response

i) Circular economy approaches were listed under Section A4: The proposed alternative scenario. These include design out waste and pollution through waste minimization, resource efficiency and productivity improvement and extended durability of products. Removal and avoidance of harmful chemicals substances in products is to ensure the recyclability and reusability of wastes; hence keeping materials and products continuously in circulation.

ii)BAT/BEP - The Stockholm Convention on persistent organic pollutants has developed the best available techniques and best environmental practices to address emission and pollution from POPs chemicals in some industries including the textile sector. This BAT/BEP will be applied to the textile sector as articulated in Component 2 of the project.

iii)Resource Efficient and Cleaner Production methodologies have been developed by UNIDO and UNEP for a systemic approach to achieve resource efficiency, productivity improvement, waste minimization and pollution control in industries. These methodologies have been demonstrated by UNIDO and UNEP in many industrial sectors including textile industries. As already indicated in the

CEO endorsement this will be implemented and will contribute to low carbon concept and ?zero to landfill? approach of circular economy.
The project wont be recycling of certain uPoPs-contaminanted wastes should be avoided to protect human health. BAT/BEP will be applied to the textile sector as articulated in Component 2 of the project to phase out the use of these chemicals. Thus ensuring POPs free textile and garment manufacturing and enhancing the recyclability of the discards.

Mitigation of land contamination will be addressed through the recycling and reuse of textile discards and wastes that are currently being disposed of in open landfills, which are causing the land contamination. The project will not address contaminated land decontamination but avoid further decontamination through the diversion of wastes into recycling businesses.

Reference
Refer to the proposed alternative scenario, section A4 in the CEO endorsement.

<u>Comments from Japan</u>
Japan requests that the following requirements are taken into account during the design of the final project proposal:

Japan Comment 1
Programs and Projects in Chemicals and Waste focal area are barred from producing the global environmental benefits indicated in the Project Identification Forms (PIF) due to the COIVD-19 outbreak, as many developing countries have suspended recycling and waste treatment, in an effort to reduce the risk of waste-treatment workers against COVID-19 virus infections. As a result, wastes including single-use plastic, medical wastes and hazardous materials have surged, resulting in widespread and illegal dumping and storage (a phenomenon which does not happen in Japan). According to our own experts, these problems are caused by a lack of technology and infrastructure (including automated intermediate treatment technology and Waste-to-Energy facilities such as incinerators), weak regulatory systems and low awareness among stakeholders. From this context, Projects (GEF ID: 10353, 10519, 10523, 10543) should be based on developing alternative scenarios that focus on sustainable recycling and waste treatment practices, taking into account pandemic risks arising from the COVID-19 outbreaks, to achieve the Global environmental benefits envisioned in the PIF. We recommend that programs in this focal area build stronger partnerships with various relevant stakeholders to address such root causes under the COVID-19 outbreak.

Response
The project is to promote circular economy that will design out wastes and avoid pollution; keep products and services in circulation and also promote regenerative economy. The project therefore is to promote also the zero to landfill concept and minimize wastes coming out of the industries. The project will therefore develop an environmentally sound waste management plan that will facilitate interconnectivity of industries and value adding facilities along the value chains. The integrated waste management plan will ensure that wastes from the textile and garment sector are recycled back to close the loop while downstream waste recycling facilities will be directly linked to textile and garment sector industries. Hence the project will ensure that wastes are not transported to or disposed in open

landfills and dumpsites but taken back into the appropriate segment of the textile and garment value chain.

This project aims at upgrading and upscaling recycling activities and businesses to produce high value products such as raw cotton that can be reused in fabric manufacturing. The project is introducing approach innovative recycling and reuse methods that are currently not been widely practiced in many of the developing industries as it will promote waste segregation and waste stock exchange within the textile and garment value chain and selected industrial parks and zones.

For example the project will promote that investments that will promote the recycling of textile and wastes/discards into natural cotton which can then be utilized in the textile manufacturing industries in the production of fabrics for garment making. This will increase the amount of raw cotton available for use in the textile and garment making and reduce the use of synthetic materials that are more difficult to recycle and reuse.

The project will also develop business models for sustainable recycling and reuse of textile and garment wastes and discards and development of financing mechanisms.

We have taken note of the comments on covid-19 and the potential effects and impacts of covid-19 on the implementation of the project. The project has enlisted the involvement and collaboration of partners in the knowledge management and global value chains such as ZDHC, Cambridge University Circular Economy Centre ; and the international fashion brands, which will bring their expertise, knowledge and competencies to ensure that the requisite resilience is built into the project to be able to achieve the envisioned global environment benefits. All these factors will be considered and necessary adaptation and mitigation strategies were undertaken during the PPG phase.

Reference

Refer to the risk section in the CEO endorsement document , the Annex J: Environmental and Social Management PlanAPPENDIX 3: COVID-19 impacts and mitigation strategies

Japan Comment 2

These indicate extremely low targets in Core Indicator 9 and 10, compared to the GEF-7 target (Indicator 9: 100,000 metric tons of POPs reduction, Indicator 10: 1,300 gTEQ of reduction of u-POPs), i.e., ID:10519: 35.01 tons (Indicator 9), ID: 10523: 25 tons (Indicator 9), 2.30 gTEQ (Indicator 10), ID:10543: 5.5 tons (Indicator 9), 11.50gTEQ (Indicator 10): These values are significantly less than the other GEF-7 CW projects whose PIF have already been approved.

Response

i. The preliminary estimates of the amount of waste in tons burned, incinerated or dumped in landfills in each of the countries is listed in below. The estimated UPOPs emission reduction is direct benefits. Indirect benefits will also be derived from resource efficiency and productivity improvement that will increase the economic competitiveness and profitability of the textile and garment sector companies and increase their outputs and reduce the volume of wastes generated. During the PPG phase a the amount of wastes generated, recycled, landfilled, open burnt and disposed will be thoroughly assessed and estimated.

?Based on UNEP uPOPS emission toolkit for open burning of wastes operation, the uPOPs emission factor is 300 ?g TEQ/ tons of wastes.

For Lesotho, the emission is calculated as follows: (300 ?g TEQ/ tons of wastes.) *13,880 tons of wastes= 4,164,000 ?g TEQ/1,000,000= 4.164 g TEQ
For Madagascar, the emission is calculated as follows: (300 ?g TEQ/ tons of wastes.) *7,000 tons of wastes= 2,100,000 ?g TEQ/1,000,000= 2.1 g TEQ
For South Africa, the emission is calculated as follows: (300 ?g TEQ/ tons of wastes.) *17,452 tons of wastes= 5,236,000 ?g TEQ/1,000,000= 5.236 g TEQ

Total: 11.5 grams of toxic equivalent gTEQ

ii.Metric tons of toxic chemicals reduced:
This is the estimated direct benefit, however indirect benefits will also be derived through information exchange and experience sharing with other industries and the co-financing to be mobilized by the Government and other counterparts.

iii. The greenhouse gas reduction benefits will be established when the detailed assessments and energy audits of the participating industries are carried, energy efficiency gains are estimated, and carbon emission reductions are calculated.

Reference
More details under the Global Environmental Benefits in the CEO endorsement document.

Comments from Germany:
France requests that the following requirements are taken into account during the design of the final project proposal:

Germany Comment 1
In component 1 it is assumed that the target group for strengthening regulatory and institutional capacities are the mentioned executing partners.
Please provide more details for each country, and explain who will take part in the technical committee (Output 1.1.3). It also seems that the whole supply/value chains of the textile and garment (TG) sector is addressed, please also provide information if project activities are concentrated on specific steps (e.g. manufacturing) in the TG value chain as the whole value chain presents major challenges for circularity and transparency.

Response
The projects through training, awareness raising and knowledge and capacity strengthening activities will target several groups, not only the executing partners, including:
Private sector companies? employee (with an estimated number of 2 companies per each country for the pilot demonstration) involved in the production, who will be trained on BAT/BEP/RECP. This training will also be open for the wider TG sector companies.
? Policy makers, regulatory, compliance monitoring bodies and custom officers, etc.
? Training banking and financial institutions on green financing (financing of green investments in processes, products and services) appraising.
? Prospective entrepreneurs who are interested in recycling business will be trained.

? Training NGOs and public awareness raising on hazardous chemical including POPs, recycling, and investment opportunities.

The TOR and the members of the technical committee (Output 1.1.3) will be defined during the project implementation. The committee will include the relevant ministries, TG associations, NGOs and relevant stakeholders.

The textile and garment value chain involves different stages of production:

? Fabric assembly factories (garment)

? Processing factories where materials are turned in fabrics ready for assembly through printing, dying, laundering and embroidery.

? Processing facilities where spinning, knitting and weaving take place. Dyes and bleach can also treat yarns.

? Raw material suppliers, including chemical suppliers

The project will target the Raw material/chemical suppliers and Processing factories (mainly component 2) and garment assembly factories and end of life (mainly component 3). Through partners and the coordination with ongoing projects, the project will have an impact on the entire value chain.

Reference

Refer to the proposed alternative scenario, section A4 in the CEO endorsement and Annex I: Stakeholder Engagement Plan

Germany Comment 2

In the entire proposal POP prevention and disposal should be linked more strongly to the topic Circular Economy and Circular Economy as the core topic should be more strongly emphasized.

Circular Economy is not integrated in most curricula of universities and professorships and research groups on circularity only exist in a niche, a shift in education is needed to strengthen regulatory and institutional framework. This should be considered as well under component 1 and/or component 4 (e.g. under Outputs 1.1.2, 4.1.1, 4.1.2).

Response

The project will develop of training modules and teaching resources that can also be used in existing school curricula and university research programmers. Furthermore, the project will strengthen and involve academic institutions such as universities and research centres to help improve or complement the curricula on improved technology and issues related exclusively to ESM of chemicals and wastes and all its technical, economic, environmental, and social implications.

Cambridge University Circular Economy Center, will support in the development of tools, school curricula and university research programmes especially training of and knowledge sharing with two research centers in the region (one in South Africa and one in Ethiopia under GEF project 10683).

Reference

Refer to the proposed alternative scenario, section A4 in the CEO endorsement

ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

The committed funds will be spent in the project start-up phase (up to one year of endorsement), i.e. they will be used predominantly to strengthen the capacity of and provide training to the REE and NEEs on the project execution arrangements with due consideration of the updated GEF guidelines on the project and programme cycle policy (the training of the REE and NEEs is directly related to project/country preparation and as such its cost is eligible to be financed from the PPG).

Table 1. Status of Utilization of Project Preparation Grant (PPG)

Project Preparation Activities Implemented	***GETF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent To date***	***Amount Committed***
Stakeholder engagement activities (consultations, workshops, steering committee, information sharing)	5,000	44,200	44,859.96
Project implementation/execution modalities (TORs & trainings), and Co-financing letters	10,000		
Preparatory studies and baseline data collection	100,000	3 Contracts for local consultancies and international experts: 76,887	
ESS	10,000		
Gender Assessments	10,000		
PEE assessment (KPMG)		30,032.25	
Finalization of CEO endorsement for UNIDO internal submission.	20,000	All above contributed plus Research & Project Development: USD 4,020.99	
Total	200,000	155,140.04	44,859.96

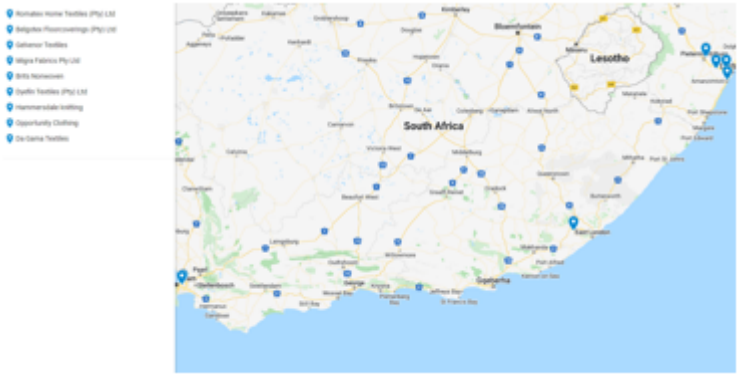
ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.

Lesotho

Madagascar

South Africa



? Romatex Home Textiles (Pty) Ltd: 183 Epping Ave, Leonsdale, Cape Town, 7490, South Africa

? Belgotex Floorcoverings (Pty) Ltd: 20 Chesterfield Rd, Willowton, Pietermaritzburg, 3201, South Africa

? Gelvenor Textiles: Corner Anderson &, Morewood Rd, Elangeni, Mpumalanga, 3699, South Africa

? Migra Fabrics Pty Ltd: 35 Packer Ave, Epping, Cape Town, 7475, South Africa

? Brits Nonwoven: New Germany Industrial Park, Gate 5, 14 Valley View Rd, New Germany Industrial Park, New Germany, 3610, South Africa

? Dyefin Textiles (Pty) Ltd: 1 Dickens Rd, Athlone Park, Amanzimtoti, 4126, South Africa

? Hammersdale knitting: Unnamed Road, Hammarsdale - Sterkspruit, Mpumalanga, 3699, South Africa

? Opportunity Clothing: Hammarsdale - Sterkspruit, Mpumalanga, 3700, South Africa

? Da Gama Textiles: Hargreaves Avenue, Zwelitsha, 5608, South Africa

ANNEX E: Project Budget Table

Please attach a project budget table.

This is a summary of the budget table for the project. Please refer to the uploaded Annex H for a more detailed budget per outputs and per year.

Summary Budget

Cost Categories	Detailed Description	Component (USD)							
		Component 1	Component 2	Component 3	Component 4	Sub-total	M&E	PMC	Responsible Entity
Local consultants	National Project Coordinator	0	0	0	0	0	0	85.000	NEEs
	Project Assistant	0	0	0	0	0	0	50.000	NEEs
	Financial Specialist	0	0	0	0	0	0	70.000	NEEs
	National Knowledge managment Specialist	0	0	0	25.100	25.100	0	0	NEEs
	Gender Expert	0	0	0	62.100	62.100	0	0	NEEs
	Policy and Legal expert	76.200	0	0	0	76.200	0	0	NEEs
	BAT/BEP/RECP experts	36.920	92.000	0	0	128.920	0	0	NEEs
	Waste and CE expert	36.000	0	130.600	0	166.600	0	0	NEEs
	Monitoring Specialist	0	0	0	0	0	100.000	0	NEEs
	Sub-total Local Consultants	**149.120**	**92.000**	**130.600**	**87.200**	**458.920**	**100.000**	**205.000**	
International consultancy / Event Organization	Regional Project Coordinator	0	0	0	0	0	0	45.000	REE
	Regional Project Assistant	0	0	0	0	0	0	25.000	REE
	Regional Knowledge managment Specialist	0	0	0	86.000	86.000	0	0	REE
	BAT/BEP/RECP expert	0	96.600	0	0	96.600	0	0	REE
	International waste expert	0	0	69.100	0	69.100	0	0	REE
	Expert on new business models (chemical leasing)	0	19.000	0	0	19.000	0	0	REE
	Finance and business expert	0	0	27.500	0	27.500	0	0	REE
	international supply chain expert	0	0	60.000	0	60.000	0	0	REE
	Mid-Term Review consultant	0	0	0	0	0	50.000	0	UNIDO
	Terminal Evaluation consultant	0	0	0	0	0	60.000	0	UNIDO
	Sub-total International Consultants	**0**	**115.600**	**156.600**	**86.000**	**358.200**	**110.000**	**70.000**	
Contractual Services-Company	ICLEI Africa: Policy Act. 1.1.1, 1.1.5	108.960	0	0	0	108.960	0	0	REE through service provider (ICLEI
	ZDHC: chemical Mangment Act. 1.16,2.1.1,2.1.3,2.1.4,2.2.1,2.4.2	5.000	53.200	0	0	58.200	0	0	REE through service provider (ZDHC)
	CEC (business models& training) Act. 2.4.1, 3.3.1,3.3.2,3.3.3,3.3.4	0	50.000	100.000	0	150.000	0	0	Cambridge University CEC
	SFA (market requirments): Act. 1.1.5, 1.1.4, 4.2.1	60.000	0	80.000	0	140.000	0	0	REE through service provider (SFA)
	Research centre Act. 2.4.1, 4.1	0	58.000	0	22.000	80.000	0	0	REE through service provider (Research
	Global KM (4.2) (NRDC)	0	0	0	150.000	150.000	0	0	REE through service provider (NRDC)
	Waste managment compnay	0	0	126.300	0	126.300	0	0	REE/NEEs through service provider
	Technology provider and training: Act. 2.5	0	700.000	0	0	700.000	0	0	REE/NEEs through service provider
	Technology provider and training: Act. 3.7	0	0	3.500.000	0	3.500.000	0	0	REE/NEEs through service provider
	Sub-total Contractual Services –	**173.960**	**861.200**	**3.806.300**	**172.000**	**5.013.460**	**0**	**0**	
Travel	International travel	45.000	80.000	110.000	60.000	295.000	0	0	REE & NEEs
	Local travel	60.460	50.000	145.000	60.000	315.460	0	0	REE & NEEs
	Sub-total Travel	**105.460**	**130.000**	**255.000**	**120.000**	**610.460**	**0**	**0**	
Office supplies	Office supplies	0	0	0	0	**0**	0	15.000	REE & NEEs
	Sub-total Office supplies	**0**	**0**	**0**	**0**	**0**	**0**	**15.000**	**0**
Training/wrkshop/meeting	Meetings PSC	0	0	0	0	**0**	50.000	0	REE
	Meetings PIC	0	0	0	0	**0**	10.000	0	NEEs
	Meetings TC	0	0	0	0	**0**	10.000	0	NEEs
	Stakeholders Mobilization workshop	0	0	0	0	**0**	10.000	0	REE and NEEs
	Stakeholders Engagment workshop	71.460	0	0	0	**71.460**	10.000	0	REE and NEEs
	Training and capacity building on BAT/BEP/RECP (2.4.3)	0	60.000	0	0	**60.000**	0	0	NEEs
	Training and capacity building in ISWM and BAT/BEP for ESM of wastes (3.2.2)	0	40.000	40.000	0	**80.000**	0	0	NEEs
	Developing and delivering of awareness and capacity building training as per national awareness/	0	41.400	0	62.100	**103.500**	0	0	NEEs
	Participation at global/ industry events	0	0	0	14.000	**14.000**	0	0	REE
	South-South global meeting with UNIDO	0	0	0	30.000	**30.000**	0	0	REE
	Sub-total Training/workshop/meeting	**71.460**	**141.400**	**40.000**	**106.100**	**358.960**	**90.000**	**0**	
	TOTAL YEARS 1-6	**500.000**	**1.340.200**	**4.388.500**	**571.300**	**6.800.000**	**300.000**	**300.000**	

6.800.000	**7.400.000**

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

NA

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agencys is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

NA

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies? capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).

NA