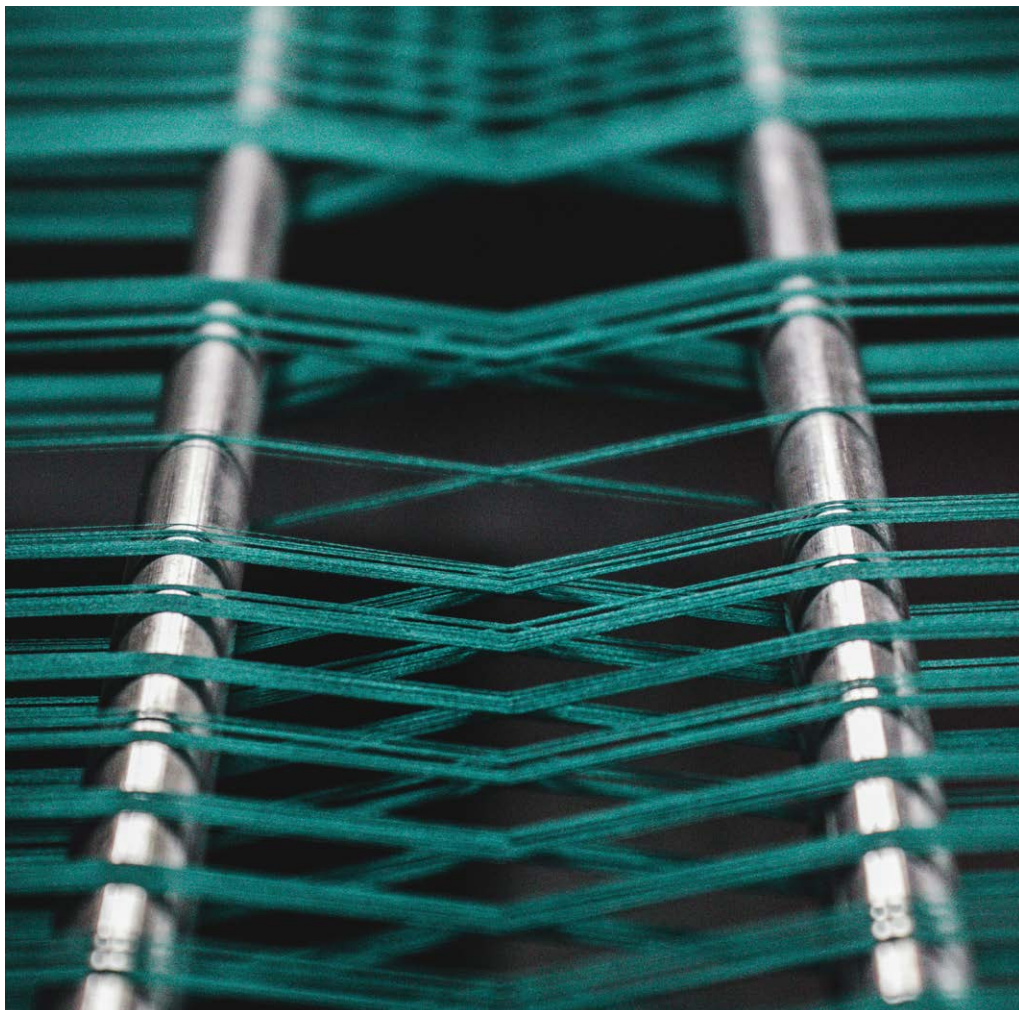


# MED TEST III

*Switch to circular value chains to boost the competitiveness of Tunisia's textile and clothing industry*



Implemented by:



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

SwitchMed is co-funded by:



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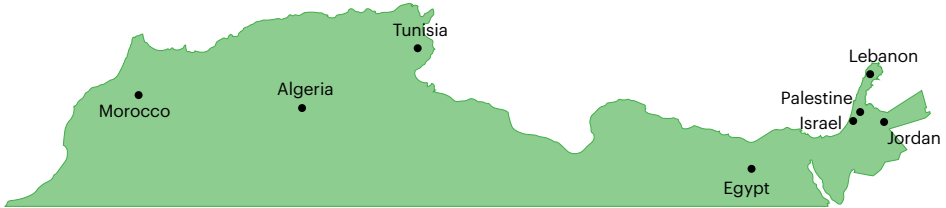
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## *The SwitchMed programme*

Launched by the European Union (EU), the SwitchMed Programme has since 2014 demonstrated the potential for a green and circular economy in Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. Through industry demonstrations, policy development, networking opportunities, and support for start-ups and green entrepreneurs, SwitchMed up-scales the transition towards Sustainable Consumption and Production (SCP) practices in the Southern Mediterranean region.

Through the promotion of business models that can reduce the inefficient use of resources and the environmental footprint of existing economic activities, the SwitchMed programme supports long-term resilience and an economic transformation of the region to meet economic, social, and environmental challenges related to the climate change.

Designing out waste, reducing pollution, and keeping products and materials longer in use are all cornerstones of a circular economy. These principles also outline the activities of the United Nations Industrial Development Organization (UNIDO) in developing resource-efficient and circular industries under the second phase (2019-2023) of the SwitchMed programme.



## *The textile initiative in Tunisia*

Textile and ready-made garment manufacturing demands significant amounts of resources and generates unprecedented volumes of waste and effluents. At the same time, the supply of resources is limited and threatened by a worldwide shortage and high price volatility. Retaining the value of these 'resources' and reducing the environmental footprint is not only a necessity for Tunisia's textile and clothing industry, but it also provides a unique opportunity to strategically reposition the sector and improve the economic resilience of businesses using production standards to meet future market demands for sustainably produced products.

Together with the Ministry of Industry (Ministère de l'Industrie, des Mines et de l'Énergie) and the Ministry of Environment (Ministère de l'Environnement), UNIDO is under the SwitchMed Programme working on two types of projects that can demonstrate the benefits of eco-innovative production models in the supply chain of the textile and clothing sector.

In the first workstream, UNIDO, together with the ZDHC Foundation, demonstrates and builds local capacities in Tunisia for the implementation of safer chemical management practices that can protect the environment and increase the ability of the textile and garment industry

to produce in line with international standards for sustainable products. For the second work-stream, UNIDO demonstrates, together with actors from Tunisia's textile and clothing value chain, the potential for recycling pre-consumer textile waste to support the development of a value chain for better recycling textile fibres in Tunisia.

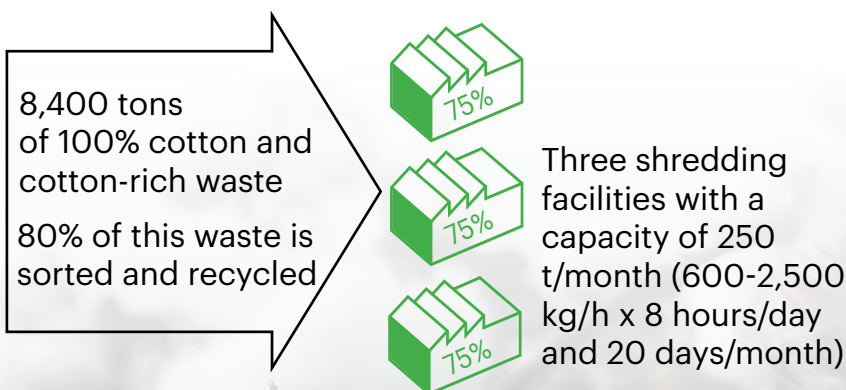
### *Mapping the textile waste ecosystem*

In 2021, Blumine and Reverse Resources, with the support from the Tunisian Textile and Clothing Federation (FTTH), undertook under the SwitchMed programme a waste mapping study for UNIDO. The study analyzed the textile waste value chain, engaging a representative group of key actors, estimating the volumes of pre-consumer textile waste flows generated by Tunisia's textile and clothing industry to 31,000 tons per year, with the largest share (27%) located in the Governorate of Monastir.

According to the study, non-knit cutting waste makes up about 14,000 tons and knit cutting waste is about 5,400 tons per year. Manufacturers often deliver the textile waste "in bulk" without any proper categorization or sorting, and most of the high-quality recyclable waste is exported as the country does not have sufficient recycling capacities. At the same time, Tunisia imports approximately 143,000 tons of yarn and fabrics to cover the need of the textile and clothing industry.

The study estimated that if we consider only the higher value waste in the Center-East region (100% cotton and cotton-rich waste), a segregation rate of 80%, and a capacity utilization of 75%, there is potential room for three recycling plants with modern and state-of-art technology.

### *Simulation of shredding potential in Center-East region of 100% cotton + cotton-rich waste\**



\*Source: (2019) Blumine & Reverse Resources

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## *Valorizing textile waste: an opportunity for Tunisia's industry*

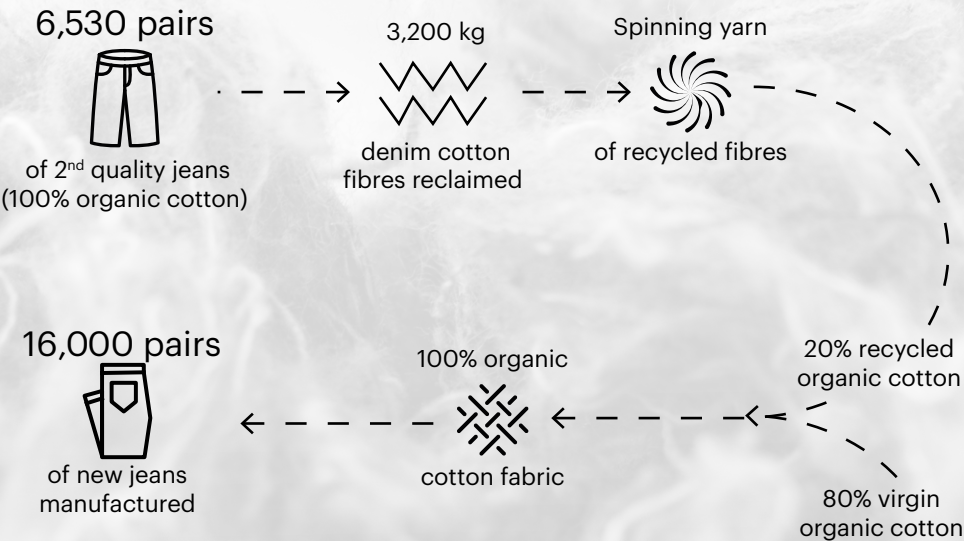
Developing a local value chain for recycling textile fibres would allow Tunisia to create new economic opportunities and help respond to the increasing global demand for recycled fabrics. It would also provide a unique opportunity to retain the value of textile waste as a resource for the region's industry and reduce its dependency on expensive imports. From 2020 to 2021, UNIDO, the Swedish denim brand Nudie Jeans and their suppliers in Tunisia accomplished to repurpose 6,530 pairs of second quality jeans into 16,000 new pairs of jeans with a composition of 20% of recycled cotton during a SwitchMed pilot project. This collaboration demonstrated a business case and the potential for high-value recycling of pre-consumer textile waste in Tunisia's textile and clothing sector, setting an example of retaining the value of textile waste in the country.

The high-value recycling concept implies recycling used or pre-consumer unsold garments and other textile waste into new garment products instead of downcycling in lower-value products. This concept can reduce the environmental impact of producing jeans, especially in terms of water and carbon footprint and hazardous chemicals in agriculture, by substituting virgin with recycled cotton.

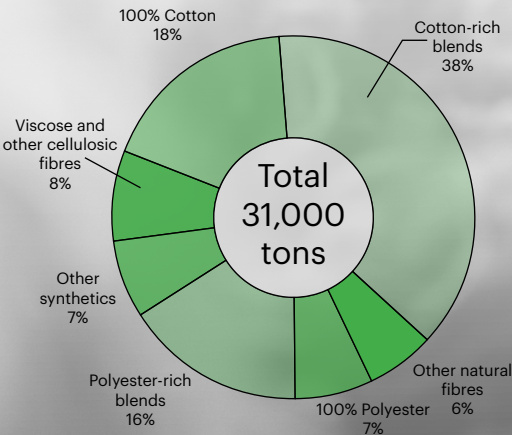
The SwitchMed waste mapping study also indicates market opportunities for lower-value waste, which cannot easily be recycled into new yarns. Industrial symbiosis is the solution for redirecting these waste streams toward other industries that will use this material as feed-stock. These other destinations include, for example, non-woven applications for insulation, automotive, or furniture.

Two industrial pilots have been identified following the waste mapping study results to demonstrate the different steps and business models for furthering the valorization of pre-consumer textile waste in Tunisia. At the end of the SwitchMed/MED TEST III project in Tunisia, a roadmap will be developed to strengthen the regulatory framework for textile waste recycling and help waste management authorities, industry federations, and other relevant institutions eliminate the obstacles for valorizing textile waste in Tunisia. This is important to ensure the viability of the business models tested through the SwitchMed/MED TEST III demonstration pilots.

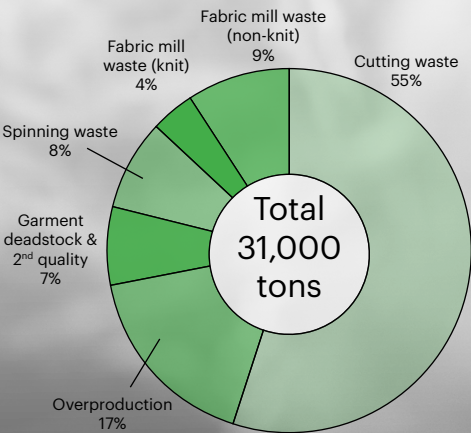
# *Nudie Jeans pilot: Reintroducing recycled textile fibres from second quality products into the fabrication of new jeans*



*Pre-consumer textile waste from Tunisia by fibre\**



*Generation of textile waste by process in Tunisia\**



\*Source: (2019) Blumine & Reverse Resources

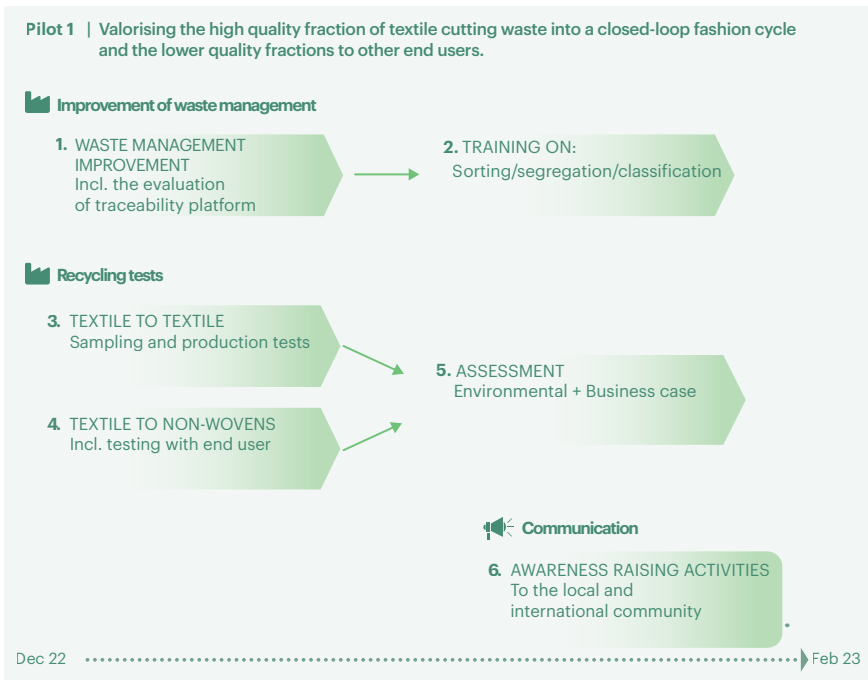


## *Pilot project 1: Demonstrating a business model for re-purposing textile cutting waste*

Pilot 1 aims to implement a net-zero carbon footprint business model on a small scale for valorising the higher quality fraction of textile cutting waste into a closed-loop fashion cycle and the lower quality fractions to other end users.

The objectives of pilot project 1 are to:

- Improve textile waste management by supporting the implementation of standard segregation and classification procedures at two local suppliers;
- Experiment and test textile to textile recycling and recycling for other end-uses;
- Demonstrate the business and environmental case for the development of a local recycling value chain.

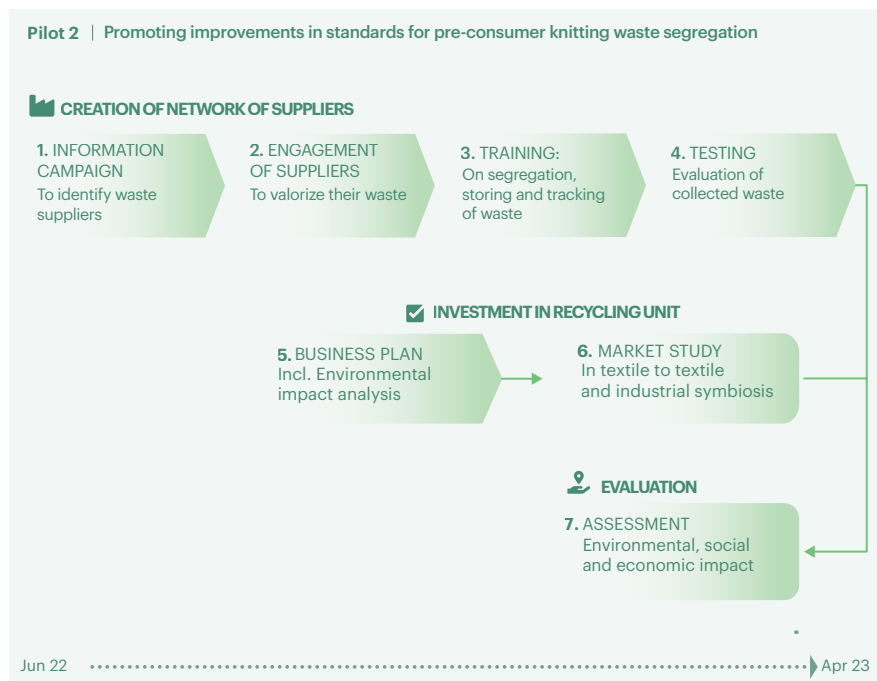


## *Pilot project 2: Promoting improvements in standards for pre-consumer knitting waste segregation*

Pilot 2 aims to increase the amount of textile waste reaching recycling markets and increase the recycling capacity of the country.

The objectives of pilot project 2 are:

- Improve waste handling practices in a group of factories to increase the amount of textile waste reaching high-end recycling uses;
- Evaluate the feasibility of an investment in new recycling technologies in Tunisia;
- Promote a more profitable local waste market to valorize waste in the country.



Funded by the European Union, the Government of Catalonia, and the Government of Italy, the SwitchMed Programme is implemented under the lead of the United Nations Industrial Development Organization (UNIDO), and MedWaves, the United Nations Environment Programme Mediterranean Action Plan (UNEP/ MAP) regional activity centre for Sustainable Consumption and Production (formerly known as SCP/RAC). The Programme is executed and in close coordination with the Directorate-General for Neighbourhood and Enlargement (DG NEAR). Each implementing organization brings its specialized experience and tools to partner with the eight countries on activities that span policy development, capacity building, business support services, demonstration activities and networking.

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