

# MED TEST III

*Switch to circular value chains to boost the competitiveness of Morocco's textile industry*



Implemented by:



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

SwitchMed is co-funded by:



Generalitat de Catalunya  
Departament de Territori  
i Sostenibilitat



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Residus de  
Catalunya



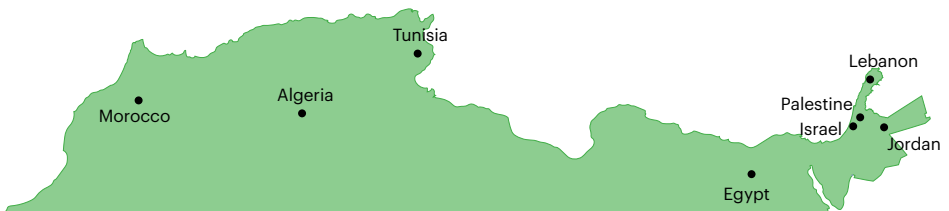
Italian Development  
Cooperation  
Ministry of Foreign Affairs  
and International Cooperation

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## *The SwitchMed programme*

Launched by the European Union, 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 by supporting start-ups and green entrepreneurs, SwitchMed scales up the transition towards Sustainable Consumption and Production (SCP) practices in the Southern Mediterranean region. Stimulating the creation of greater business opportunities that can reduce the inefficient use of resources and the environmental footprint of existing economic activities is a chance for the region to encounter economic, social, and environmental challenges.

Designing out waste, reducing pollution, and keeping products and materials longer in use are all cornerstones for 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.



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## *The textile initiative in Morocco*

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 Morocco's textile industry, but it also provides a unique opportunity to strategically reposition production standards and improve the economic resilience of businesses to meet future market demands for sustainably produced products.

Together with the Ministère de l'Industrie et du Commerce, Ministère de la Transition Énergétique et du Développement Durable, UNIDO is working in the SwitchMed Programme on two paths of pilot projects that can demonstrate the benefits of eco-innovative production models in the Moroccan textile and clothing supply chain.

In the first workstream, UNIDO, together with the ZDHC Foundation, demonstrates and builds local capacities in Morocco for the implementation of safer chemical management practices that can protect the environment increase the ability of the textile and garment industry to produce in line with international standards for sustainable products.

In the second workstream, UNIDO and actors from the local supply chain of international brands demonstrate the potential for recycling pre-consumer textile waste to assist the development of a local value chain for recycling textile fibres in Morocco.



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## *Mapping the textile waste ecosystem*

In 2021, Blumine and Reverse Resources, with the support of the Association Maroccaïne des Industries du Textile et de l' Habillement (AMITH), undertook a waste mapping study published by UNIDO. The study analyzed the textile waste value chain, engaging a representative group of key market players, estimating the volumes of pre-consumer textile waste flows generated by Morocco's textile and clothing industry to 83,200 tons per year.

According to the study, more than 75% of the pre-consumer textile waste generated in Morocco originates from the regions of Greater Casablanca and Tangier. The availability of waste in the two areas would minimize transportation costs and maximize synergies through collaborations and shared facilities, which would keep the costs down for recycling operations in Morocco. The mapping study also found significant economic potential for recycling high-value 100% cotton and cotton-rich pre-consumer textile waste in Morocco.

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

Developing a local value chain for recycling textile fibres would allow Morocco 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.

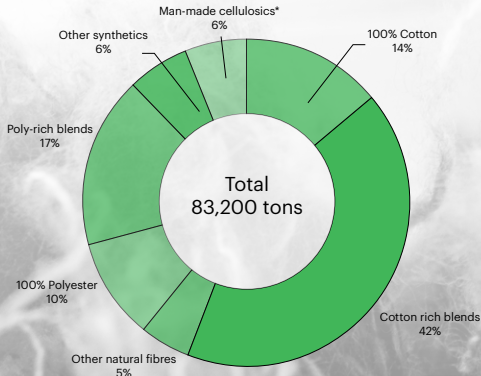
The SwitchMed waste mapping study validated business models scenarios for valorizing textile waste. For instance, the higher value textile waste available in the Casablanca region accounts for about half of the total textile waste created in the area, approximately 22,000 t per year. With a segregation rate of 80% and a shredding facility capacity utilization of 75%, the study indicates a potential for eight shredding lines with modern and state-of-the-art technology: seven operating at 75% capacity utilization and one at 58% capacity. But the study also indicates market opportunities for lower-value waste. Industrial symbiosis is the solution for redirecting lower value - lower quality waste that cannot easily be recycled into new yarns. It consists in redirecting waste streams towards another industry that will use this material as feedstock. These other destinations include, for example, non-woven applications for insulation, automotive, or furniture.

Following the waste mapping study results, two industrial pilots have been identified to demonstrate the different steps and business models for valorizing pre-consumer textile waste in Morocco.

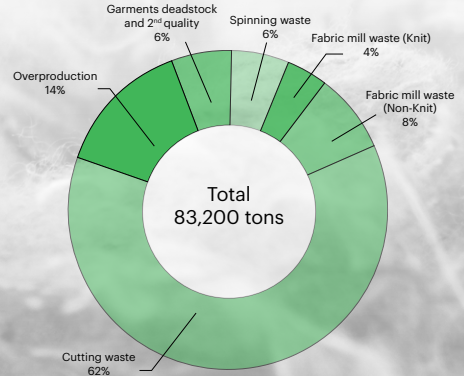
At the end of the MED TEST III project in Morocco, a roadmap will be developed to strengthen the regulatory framework for textile waste recycling and help waste management authorities, industry federations, and other relevant institutions eliminate the obstacles for valorizing textile waste in Morocco. This is important to ensure the viability of the business models experimented through the demonstration pilots.



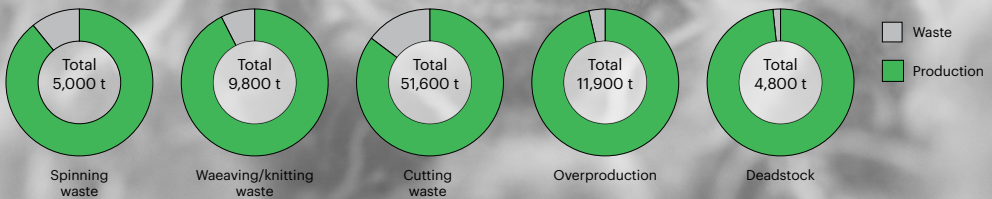
### Textile waste by fibre\*



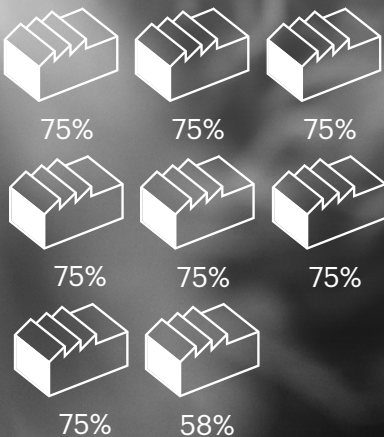
### Generation of textile waste by process\*



### Generation of waste by sub-sector\*



### Simulation of shredding potential in Casablanca 100% cotton + cotton-rich waste\*



### Scenario:

- 80% of waste is sorted and recycled
- Modern shredding line with a capacity of 250 t/month (600-2,500 kg/h x 8 hours/day and 20 days/month)
- Maximum capacity utilization of 75%.

## *Pilot project A: Manufacturing of quality yarns with recycled content by testing a local supply chain for textile recycling in Morocco*

The objective of Pilot A is to advance the local manufacturing of quality yarns with recycled content while exploring the potential of a local supply chain of textile waste and recycled fibres. Pilot A will be undertaken with EVLOX, a leading denim manufacturer based in Settat and part of the homonymous Spanish Group. With an annual production of 15 million meters of premium denim, EVLOX intends to increase the share of recycled cotton fibre in its denim fabrics and explore the potential of an investment in a recycling plant.

The objectives of Pilot project A are to:

- Transfer know-how to improve the existing process at EVLOX for spinning high quality recycled yarns
- Evaluate the location, quantity and quality of local textile waste streams and select the best potential suppliers of high-quality waste.
- Evaluate the feasibility of an investment in internal shredding capacities and assess the best technologies on the market, focusing on technologies from France, Spain and Italy.

### **Pilot A | Recycling and valorisation of textile waste in high quality cotton spinning at Evlox**



#### **Technological transfer**

- 1. TECHNICAL ASSISTANCE**  
Improvement of spinning of recycled cotton into yarn



#### **Evaluation of local suppliers**

- 1. ASSESSMENT**  
Selection of textile waste supplier(s)

- 2. SPINNING TEST**

Use of fibre recycled by external partner

- 2. TRAINING TO IMPROVE**

- Waste management
- Segregation
- Classification



#### **Feasibility analysis**

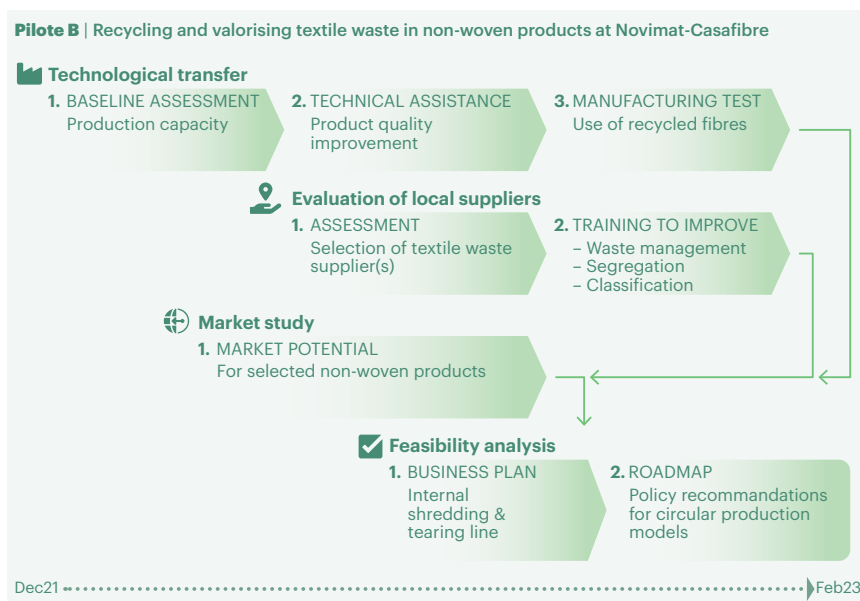
- 1. BUSINESS PLAN**  
internal shredding & tearing line

## *Pilot project B: Demonstrating business opportunities of recycling local textile waste for non-wovens applications for high end market users*

Pilot project B will demonstrate the business case for investing in a textile waste recycling plant to produce fibres for non-woven applications. The pilot will be undertaken in Novimat - Casafibre, a leading Moroccan producer of polyester staple fibre from recycled PET. Novimat - Casafibre is located in Casablanca and has an annual polyester fibre production capacity of 15,000 tons and no experience in the treatment of textile materials other than polyester. The company has recently invested in machinery for the production of non-woven insulation materials and is interested in evaluating an investment in a shredding line.

The objectives of pilot project B are to:

- Evaluating the market opportunities of different non-woven products from recycled textile fibres.
- Transfer know-how on improving the quality and the product mix of its new machinery.
- Assessing the availability of local textile waste streams.
- Evaluating the economic feasibility of an investment in internal shredding capacity and identifying the best technologies available on the market.



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) in partnership with the United Nations Environment Programme (UNEP) Economy Division, the United Nations Environment Programme Mediterranean Action Plan (UNEP/MAP) and its Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC) 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.

This publication has been produced without formal United Nations editing within the framework of the SwitchMed initiative with the financial assistance from the European Union.

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