

# **Blue Economy Synergy: Transforming Marine Resources into Sustainable Fashion Solutions**

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## **Abstract:**

The intersection of sustainability, innovation and economic viability has given rise to the concept of the blue economy, which emphasises the responsible use of renewable marine resources while preserving the health of the marine ecosystem. In this context, the textile industry has a key role to play in shaping a greener future. The aim of the project is to harness the potential of lost fishing nets and marine resources as valuable materials for the textile industry, facilitating the development of sustainable fashion innovations and ushering in a new era of environmentally conscious manufacturing.

One of the approaches of this project focuses on the collection, recycling, and transformation of abandoned, lost, and discarded fishing nets into new fibres and textile structures. This initiative aims to address the pressing environmental issue of marine pollution caused by derelict fishing gear. By reintroducing these recycled fibres into the textile industry, we aim to have a positive impact on both the environment and the manufacturing sector.

A particular challenge in the textile industry is the use of environmentally harmful additives and finishing processes. The second approach of this project is to address this challenge by focusing on the potential of seaweeds, microalgae, and their bioactive extracts. To achieve this goal, we are systematically evaluating the functional properties of microalgae, leading to the subsequent formulation of bio-based functional compounds. These compounds are then integrated into the melt-spinning process, helping to create fibres with enhanced properties while minimizing environmental impact.

The use of marine resources in the textile industry has the potential to usher in a new era of environmentally sustainable clothing and footwear, characterized by an increased level of competitiveness within the sector. The emergence of these innovative applications is expected to create value-added and competitive products in both sectors, significantly improving sustainability and promoting circularity within the industry.

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