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## CURRENT APPROACHES FOR RAW WOOL WASTE MANAGEMENT AND UNCONVENTIONAL VALORIZATION: A REVIEW

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### Abstract

Since the middle of the past century, when the synthetic fibers began their rise, wool has steadily lost importance in the textile sector, and now is a marginal fiber on the textiles market. Great amounts of non-marketed raw wool have turned from an income source for sheep farmers into a problematic waste, which is, at best, burn or landfill. With increasing interest for sustainable use of natural resources, wool was reconsidered as an underrated, underused renewable resource, worthy of a better exploitation. Lately, intensive research has done on finding solutions for wool waste valorization in non-clothing applications. Two main directions to add value to wool waste have developed: in applications that exploit the native fiber properties, and in applications that use the keratin biopolymer, extracted from fibers by chemical solubilization or enzymatic bioconversion. Wool fibers in native state are most used for technical applications like green building insulation, polymer-fiber composites or sorbent materials for water pollution treatment. Keratin and its derivatives are mainly considered for the production of protein-based biomaterials for regenerative medicine. Bioconversion has a significant potential for transforming wool waste into high-value products like fertilizers for organic farming or proteolytic enzymes. The aim of this paper is to present the current management options for raw wool waste and to review literature on actual and emerging solutions for converting raw wool waste into useful and profitable materials and products.

*Key words:* natural fibers, renewable resources, waste management, waste valorization, wool

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