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Co-Composting Dried Activated Sludge and Green Waste in Larnaka District: Practical Challenges in Developing a Safe, Compliant Compost

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Abstract

In the Larnaka District, Cyprus, the Larnaca District Local Government Organization (EOAL) manages the production of dried activated sludge from municipal wastewater treatment at the Larnaka Wastewater Treatment Plant. Approximately 800 tonnes of dried activated sludge are currently provided free of charge to farmers each year, following a specific EOAL procedure approved by the Ministry of Agriculture, Rural Development, and Environment. Meanwhile, around 1,680 tonnes per year of green waste produced by local municipalities are not being utilized and currently disposed of in landfill. EOAL is assessing the feasibility of co-composting these materials to produce a stable, high-quality compost that complies with the EU Urban Wastewater Treatment Directive and supports circular economy goals. Developing such a composting process introduces several technical and operational difficulties. Dried sludge contains variable levels of moisture, nitrogen, pathogens, and organic matter, which can affect mixing, aeration, and stabilization. Green waste presents additional variability due to seasonal changes, differences in particle size, and inconsistent carbon content. Achieving and maintaining an appropriate carbon to nitrogen ratio, ensuring suitable aeration, and controlling odors are essential for process reliability. Moreover, the compost must undergo proper hygienisation to meet safety requirements. The increasing regulatory emphasis on micropollutants, microplastics, and heavy metals in biosolids requires a comprehensive analytical programme. This includes regular monitoring with validated laboratory methods to ensure that the final product is safe for agricultural use and aligned with emerging EU quality criteria. Infrastructure limitations, such as the equipment and space, may further affect the consistency and scalability of the process. A major regulatory challenge arises from the Cypriot legislation, which imposes strict restrictions on where the products may be applied. These restrictions can limit the potential uses of the compost and complicate the process of placing such a product on the market. Furthermore, transitioning from a material currently given free to farmers to a commercial product introduces economic and acceptance barriers. Farmers may be hesitant to purchase compost from sludge. However, the Ministry of Agriculture, Rural Development and Environment or Cyprus Agricultural Payments Organization, can provide benefits to support farmers in purchasing such products, which may facilitate adoption and improve acceptance This abstract outlines the initial considerations for establishing a co-composting approach for sludge and green waste in Larnaka District. It presents the main technical, regulatory, analytical, and market challenges that EOAL must address to produce a safe, compliant, and usable compost within the framework of Cyprus legislation and evolving EU policy.

Keywords: EOAL, Co-composting, Activated Sludge, Green Waste, Regulatory compliance

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