

# **Biowaste management in small communities using the home composting method: The case of the Reception and Identification Centre (RIC), Kara Tepe in Lesvos**

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## Abstract

Managing bio-waste in a sustainable way is now an imperative of modern society. Methane emissions, which contribute to global warming, and drains filled with organic and inorganic pollution are some of the problems that uncontrolled dumping of biodegradable waste into the environment can cause. As emphasised in the European Union's objectives, the implementation of appropriate waste management and treatment methods is inevitable. Composting is an alternative natural method that can be used to treat bio-waste. Compost, as the end product of the composting process, is easy to create. Furthermore, a high quality compost provides economic benefits as it can be used as a soil conditioner. This paper, focused on the management of biowaste within the Reception and Identification Centre (RIC) of Kara Tepe in Lesvos, using the method of household composting. In particular, a sampling system was designed which helped to obtain a representative sample of solid waste generation in the whole population. Then, two composting trials with an active aeration system were carried out, containing mainly food waste (from the Kara Tepe) and olive oil by-products. Two household composters named K1 and K2 were used in the tests. K1 contained: food debris and olive leaves, while K2 contained: food debris, olive leaves and biphasic kernel. During the composting process the following parameters were measured: temperature, humidity, oxygen, pH, nutrients. At the end of the process, the parameters: electrical conductivity, phytotoxicity and microbial respiration were calculated. In conclusion, the overall measurements showed that the humidity levels had large fluctuations and influenced the temperature trend. Subsequently, the pH was affected by the extended thermophilic phase reaching high levels in both piles. At the same time, the oxygen in the piles was maintained at ideal levels, as were the nutrients. From the final measurements, compost K1 was found to be phytotoxic, stable and problematic for most plants in its use as a soil amendment. However, the K2 compost was found to be non-phytotoxic, stable and potentially problematic for very sensitive plants in its use as a soil amendment. Therefore, compost K2 was found to be more efficient than compost K1. Overall, the proposed methodology is feasible to exploit in similar infrastructures - for the on-site utilisation of food residues - and the final costs of water and electricity of this experiment were found to be quite affordable.