Analysis and perspectives on home and community composting in Portugal

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INTRODUCTION

Environmental waste management supports both the circular economy and climate change mitigation. In 2024, municipal waste (MW) generation in the European Union (EU27) reached 517 kg per capita, representing an increase of 6 kg compared to 2023 and 38 kg (+8%) compared to 2014. Municipal waste generation per capita was highest in Austria (782 kg/capita), and lowest in Romania (305 kg/capita). In 2024, Portugal reached 519 kg per capita of MW. In the European Union EU27, biowaste accounts for over 34% and food waste for about 26% of total MW (Eurostat, 2026). In Portugal, the biowaste fraction represents around 38% (APA, 2025). Therefore, recycling biowaste is crucial to achieve the EU target of recycling 65% of MW by 2035. Since December 2023, the implementation of separate collection and source separation of biowaste has driven the adoption of decentralized solutions, such as domestic composting. These systems allow treatment at the source, reducing the costs associated with collection, transportation, and final disposal of biowaste (Sulewski *et al.,* 2021; Oviedo *et al*., 2025). Composting is a biological aerobic process that produces compost, which can be used as fertilizer or soil improver. Domestic composting can be divided into home composting, which can be carried out in both rural and urban settings by individual households, and community composting, which is typically implemented in urban areas where multiple households share a common system for managing organic waste. Generally, composters used for home composting have a capacity of about 300 L (Figure 1), while composters for community composting have a capacity of 1 m³ (Figure 2). Research on domestic composting indicates that many European countries have made significant investments in this waste treatment method. Nevertheless, several challenges have been identified, including limited public engagement, slow degradation of organic matter, and the presence of contaminants in the resulting compost (Bruni *et al*., 2020). Considering the regional specificities of waste management systems in Portugal, further studies are required to better understand these constraints and to develop appropriate mitigation strategies.

Figure 1. Home composter (CMOeiras, 2022).

Figure 2. Community composter (Correia, 2026).

AIM OF THE STUDY

The present study aims to analyse and evaluate the domestic and community composting programs currently implemented by Portuguese municipalities and waste management entities, in order to assess their scope, effectiveness, and contribution to sustainable waste management practices.

METHODOLOGY

The methodology of this study is based on a literature review of peer-reviewed publications and master's theses, complemented by information from official Portuguese municipal websites. Empirical data are also collected through a structured survey, primarily composed of closed-ended questions to ensure consistency and comparability. The survey targets mainland Portuguese municipalities implementing domestic composting programs and is organized around three main dimensions: participation and program scope, operational procedures and logistics, and the types of equipment provided along with participant profiles and levels of engagement.

RESULTS AND DISCUSSION

A review of the websites of Portuguese municipalities and urban waste management entities regarding home and community composting revealed that data on active composters are not always available, despite the existence of information on how to carry out domestic composting and the implementation of various awareness-raising initiatives. To provide an overview of the domestic composting equipment currently in use, approximately 40 municipalities (Figure 3) were selected, representing around 57% of the population (6,131,280 inhabitants). The number of home composters is approximately 35,315 and the number of community composters is about 335. Nevertheless, the actual number of composters in operation is expected to be significantly higher, since most municipalities lacking available data indicate that they have promoted domestic composting programs in recent years. In order to comply with Commission Implementing Decision (EU) 2019/1004, the Portuguese Environment Agency (APA) developed a methodology in 2026 for calculating recycling at source of biowaste (home and community composting). This methodology provides guidance for accounting for separately collected biowaste as recycling toward the preparation for reuse and recycling targets. Regarding biowaste management, most municipalities have a capture rate of 1–5% of total biowaste generated, and 41 municipalities have not yet implemented any biowaste collection or treatment system (Figure 4).

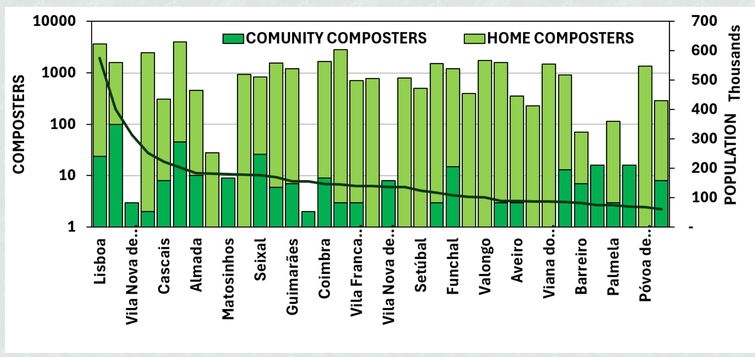

Figure 3. Distribution of home and community composters, and population of 41 municipalities of Portugal.

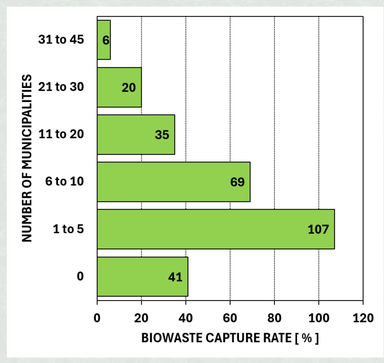

Figure 4. Biowastes capture by municipalities (adapted from APA, 2025).

The 22 urban waste management entities have also played an important role in the implementation of home composting, as evidenced by the amount of biowaste recycled at the source in 2024 (Figure 5), except AMCAL entity, with 0 t. Also, the amount of recycled biowaste at source increased nearly 40%, from 17,663 to 28,952 t in two years (Figure 6).

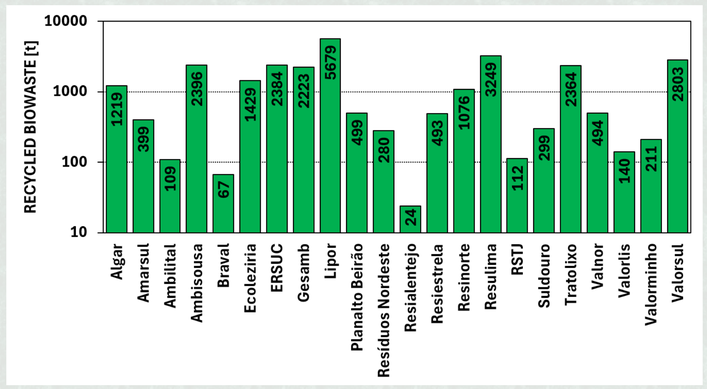

Figure 5. Recycled biowaste at source by MW management entities municipalities of Portugal (adapted from APA, 2025).

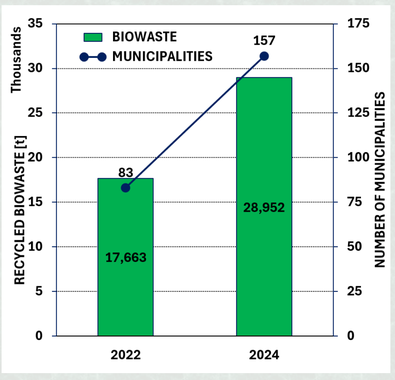

Figure 6. Recycled Biowastes and municipalities, in 2022 and 2024 (adapted from APA, 2025).

CONCLUSIONS

The results indicate that domestic composting in Portugal has developed considerably, driven by European biowaste diversion targets and growing environmental awareness. This is reflected in the increasing availability of household and community composters across the country's most populous municipalities. Domestic composting has evolved from isolated initiatives to structured municipal policies focused on the distribution of composters and the implementation of community composting initiatives. In 2024, 157 municipalities enabled the treatment of 28,952 t of biowaste at source. However, this represents less than 2% of the estimated potential of biowastes, highlighting significant scope for further expansion. The municipal survey is still ongoing, so the present study remains under development.

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