

Decentralized composting of municipal bio-waste. European best practices and local initiatives in the Cluj-Napoca Metropolitan Area

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Introduction. Bio-waste is the largest single component of municipal waste in the European Union (EU) – it represents 34 % of all collected municipal waste (EEA, 2020). In urban areas (where much of the European population now lives) a large share of the bio-waste remains “trapped” in the residual waste. As a consequence, most of it is landfilled or incinerated. The EU’s waste policy tried to divert as much bio-waste as possible from landfills and recycle it. The revised 2018 Waste Framework Directive requires the separate collection and treatment of bio-waste or the recycling at source (e.g., home composting). In Romania, where the share of the bio-waste in the collected municipal waste is around 57% (PNGD, 2017, p. 27), a law on bio-waste management was issued in 2020. This law requires the separate collection and treatment of bio-waste starting with January 1st, 2021. However, the organization of the separate collection and treatment of bio-waste is slow and ineffective (Drăgan, 2021) and the processing capacity of the composting facilities is not enough for treating the estimated quantity of generated vegetal bio-waste (Feodorov, 2018). In several urban areas in Romania where the separate collection of the bio-waste from households already started, a very high level of macro-contamination was reported by some waste management companies.

While these observations point towards dysfunctionalities and late starts, it does not mean that the bio-waste management in Romania would turn out to be a failure. In the present paper we explore the possibility of a decentralized bio-waste management in urban areas. This would allow for experimentation and variation, and a better adaptation to the local conditions. First, we present three decentralized composting systems applied in the European Union, then several local initiatives for decentralized composting in the metropolitan area of Cluj-Napoca, Romania.

Methodology. In order to identify different models of decentralized composting in the EU we went through the case-studies listed on the Zero Waste Europe NGO’s webpage. We found out about the decentralized composting projects in Romania by searching the internet for composting projects and groups of people promoting composting in urban areas. We then further focused on such initiatives in the Cluj-Napoca metropolitan area. We searched information about the local, voluntary initiatives on local mass-media, on social media (groups of people interested in separate collection and composting of bio-waste, groups of local producers and consumers), on environmental NGOs web sites. We also attended the online webinar „The compost in the city” (April 27th, 2021) organized by a local NGO.

Results and discussion

Decentralized composting models in urban areas in the European union

Case-studies from the EU show that decentralized composting may be a complementary solution, and, in some areas, even a viable alternative for the centralized collection and treatment of bio-waste. In the European regions where such models were applied, increased efficiency of the municipal waste management ensued (the quantity of landfilled or incinerated waste decreased, the share of recyclables increased) and the cost of waste management for the local municipalities decreased (Condamine, 2020).

In the first part of the paper, we present three decentralized composting models (from Austria, Spain, and Belgium) applied in urban areas of Europe and compare them in terms of spatial scale,

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population involved, efficiency, and other aspects (voluntary or mandatory participation, implementation in dense urban areas, etc.). From the described case-studies resulted that in order to get good results in implementing the decentralized composting system into a specific area/municipality (implying good quality compost and large participation of the population in the separate collection of the bio-waste), the most important factors are the expert knowledge of both the biological processes involved in composting and of the local situation of the municipality where the decentralized composting is to be implemented. Moreover, the support of state agencies and local authorities is essential for establishing the practice and supporting the education of the population and the training of composting experts helps the system running smoothly.

Decentralized composting initiatives in the Cluj-Napoca Metropolitan Area

In several urban areas, local initiatives for collecting and composting bio-waste based on voluntarily participation have already appeared by 2019. The most numerous such initiatives are found in Cluj-Napoca, the second city in Romania in terms of population (over 300.000 inhabitants), with a large and fast-growing suburban area. In the second part of the paper, we describe these local initiatives: informal groups for collecting and composting bio-waste, local producers and consumer groups promoting the circular use of agricultural products, start-ups providing bio-waste collection services to urban households, community gardening in urban areas.

At the moment, the decentralized composting in the Cluj-Napoca Metropolitan Area is not an activity supported by the local authorities – the composting sites are located on private properties and information and educational activities are provided by informal Facebook groups and environmental NGOs' activities. The expansion of these practices is limited by an inexistent local strategy on bio-waste and by local regulations that do not allow the installation of composting bins on the public space in dense urban areas. To this adds the observation that the enthusiasm towards community composting may not be shared by many, as a described conflict inside the community over placing a compost bin on the green area near a block of flats illustrated.

Because of the low intensity technology and natural processes involved, composting can be done in a decentralized manner, at various spatial scales, with various quantities of bio-waste; as the case-study from Spain showed, decentralized composting is a very flexible and adaptable tool to local situations. And the various local initiatives described in this paper proved that at least a part of the population in urban area in Romania would adhere to this kind of practice. Because of that, we think that decentralized composting systems based on local initiatives could be good solutions for a large part of the urban areas in Romania. Endorsed by municipalities, they would be a good starting point for preparing the mandatory separate bio-waste collection in the future. This would also make room for experimentation and finding the best practices and the best messages for each community and would make good use of the already existing initiatives, social capital, and local energies.

Conclusions. The decentralized composting in urban areas may be a complementary system or even an alternative one (in the case of the Austrian model) to the landfilling or the incineration of the bio-waste. As seen in different regions and cities in the European Union, it can be implemented at various spatial scales with great flexibility and efficiency. From the three selected case-studies of decentralized bio-waste management in urban areas, several good practices emerged for a successful story: get a very good knowledge of the local situation, involve the local authorities, keep the resources local, train expert composters (that know very well the biological processes involved at various scales), and educate the population.

Although very recent and at much smaller spatial scales than the international decentralized composting systems described in the first part of the paper, local initiatives towards decentralized composting appeared in Romanian urban areas as well. In this paper we focused on the bottom-up initiatives in the Cluj-Napoca Metropolitan Area as examples of various solutions for decentralized composting in urban and peri-urban areas in Romania – informal groups for collecting and composting biowaste, local producers and consumer groups promoting the circular use of agricultural products, start-ups providing biowaste collection service to urban households, community gardening

and composting. The described cases represent a starting point for the development of solutions for the management of bio-waste in Romania at local scales, in accordance with the circular economy principles.