INTEGRATED ENVIRONMENTAL ANALYSIS OF URBAN WASTE SEPARATE COLLECTION IN THE SORRENTO PENINSULA, IN ITALY

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The main aim of this work was to study the kerbside collection system of two municipalities in the Sorrento peninsula (in Italy) with an integrated approach based on the three pillars of sustainability: society, environment and economy. The studied municipality are Sorrento (16,745 inhabitants, 1,681 inhabitants/km²) and Piano di Sorrento (13,159 inhabitants, 1,793 inhabitants/km²). Piano di Sorrento and especially Sorrento are tourist towns and this obviously has an impact on the quantity and quality of urban waste. In 2014, the percentage of separate collection was 63.3% in Piano di Sorrento with a per capita production of 465.7 kg/inhabitant/year, and 63.8% in Sorrento with 775 kg/inhabitant/day. In every municipality, there is a separate collection centre (SCC). In the SCC, the citizens can deliver the recyclables from urban waste obtaining economic benefits similarly to the system described in De Feo and Polito (2015). The sociological analysis was developed by means of a structured questionnaire similar to that developed by De Feo and Polito (2015). The economic analysis was conducted in the light of the Extended Producer Responsibility (EPR) system, evaluating the money recovery from the recyclable materials theoretically contained in the residual waste. The analysis was carried out considering three real scenarios: (1) 2000, without separate collection; (2) 2008, when the Campania region of Southern Italy was suffering serious problems with the management of urban waste because the region did not have enough waste management facilities; (3) 2014, when there was an effective kerbside collection system in the two municipalities. The environmental analysis was performed for scenarios (1), (2) and (3) applying the Life Cycle Assessment (LCA) approach to the urban waste management, internal collection and external transport systems. As shown in Figure 1, in 2014, the increasing percentages of separate collection allowed to avoid the production of environmental impacts, with greater benefits for the citizens of Piano di Sorrento. On the other hand, for Sorrento it was calculated the number of theoretical additional touristic bus/day in the case of a “Zero Waste” management of the hotels in terms of avoided production of equivalent CO₂. The result was obtained as the ratio between the difference of the impact produced by the hotels all operated in a normal way and the hotels all managed with a “Zero Waste” approach, and the impact of a single bus (as a function of the distance).

![Figure 1](image-url)

**Figure 1** – Per capita values of Recipe Point (Pt) (a), and number of theoretical additional bus/day in the case of a “Zero Waste” management of the hotels in Sorrento (b).

References