



Using economic benefits for recycling in a separate collection centre managed as a “reverse supermarket”: A sociological survey



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ABSTRACT

Separate collection centres (SCCs), where citizens can deliver recyclable fractions of municipal solid waste (MSW), in an “urban mining” perspective, can be considered a sort of “reverse supermarket”, where people can deliver their recyclables in order to either obtain a waste fee reduction or shopping vouchers. The latter is the case of Baronissi, a town of around 17,000 inhabitants in the Province of Salerno, in the Campania region of Italy. The principal aim of the study was to investigate by means of a sociological survey the relationship between citizens and the separate collection program, with particular emphasis on the role played by the SCC. The separate collection system was evaluated either good or very good by 95.8% of the sample, while 99.2% expressed a good or very good evaluation of the quality of the service inside the separate collection centre: SCC users acted as a community as highlighted by the negative response of the Chi-square test for independence. Respecting the environment prevailed over saving time, obtaining eco-points, or saving money as the main reason why people went to the SCC. The majority of the respondents agreed if only putrescibles and residue should be collected directly from their homes, while all the other materials should be collected exclusively at the SCC, allowing to save money for the management of the kerbside collection system with a consequent further waste fee reduction for the residents.

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1. Introduction

The recovery of secondary raw materials from municipal solid waste (MSW) is a moral, legal and ethical duty. Wasting resources is not acceptable especially in the European Union (EU) that strongly depends on the importing of raw materials such as oil, gas, minerals, metals, etc. from non-European countries. The EU environmental policy recognizes this issue since it is at the first levels of its waste management strategy, just after the reduction of waste production (Directive 2008/98/EC). The concept of “urban mining” (Krook and Baas, 2013), in particular, suggests to consider as “materials” those things that are still erroneously called “wastes”.

Materials are recovered from MSW by means of separate collection programs. There are two main options to separately collect materials: the bring and the house-to-house kerbside collection systems. With the first method, putrescibles, recyclable materials (e.g. paper, plastic and glass bottles, cans and other metals, textiles, etc.) and residual waste (or “residue”) are delivered to several col-

lection banks sites. On the opposite, materials are collected door-to-door with the kerbside system.

The separate collection centres (SCCs), that are centralised collection sites where the citizens can deliver the recyclable fractions of MSW, allow to integrate the two collection modalities as well as to exploit the advantages of the two systems and minimize their defects (De Feo and De Gisi, 2010a). Usually, they are fenced and manned areas, equipped to weigh and collect mainly recyclables. They can also be considered as educational centres because they are places where people can be informed and made aware of the separate collection program rules, actions for the reduction of waste production and improvement of waste management, etc. (De Feo, 2014).

In Italy, SCCs are starting to be used as a sort of “reverse supermarket”, where people can deliver their recyclables in order to obtain a waste fee reduction for the MSW management or shopping vouchers to spend in local shops (Harder and Woodard, 2007). The latter is the case of Baronissi, a town of around 17,000 inhabitants in the Province of Salerno, in the Campania region of Italy.

Finnveden et al. (2007), discussing different strategies and policy instruments for waste management in Sweden, pointed out

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that financial incentive is a way of increasing the willingness of people to source separate waste. Harder and Woodard (2007) investigated series of medium scale trials of various voucher based incentives schemes for household recycling carried out in England. Successful schemes were those where the vouchers were awarded on an individual household basis as well as the value of each voucher was over 0.60 euro. Boonroda et al. (2015), through a case study in Thailand, pointed out that an economic incentive mechanism allows to further increase the organic waste separation behaviour at the source, as well.

Sidique et al. (2010) specifically studied the profile of people who utilize SCCs in Lansing, the capital of the U.S. state of Michigan, obtaining the following results: the usage of SCCs is influenced by demographic factors such as age, education, income and household size; attitudinal factors also affect SCCs usage; people tend to use SCCs more when they feel that recycling is a convenient activity and when they are more familiar with the available recycling facilities.

The principal aim of the paper was to investigate by means of a sociological survey (using a structured questionnaire) the relationship between citizens (going to the SCC) and the separate collection program, with particular emphasis on the role played by the SCC.

We wanted to understand the main reason why people went to the SCC (saving time, obtaining eco-points, respecting the environment, or saving money). Knowing why people do something is important if we want to change for the better their behaviour, also in the waste management sector as highlighted by a number of studies developed over the last three decades (Guagnano et al., 1995; Chan, 1998; Martin et al., 2006; Ojedokun, 2011; De Feo and Williams, 2013).

Moreover, we wanted to verify whether people agreed if only putrescibles and residue could be collected directly at their home, with all the other materials (mainly recyclables) being collected exclusively at the separate collection centre. This change would produce two important results: costs decrease, due to the diminishing of the collecting vehicles needed, and quality improvement of the collected materials since they would be carefully checked into the SCC as testified by the results already obtained in the town of Baronissi in the period 2010–2013 both in terms of costs decreasing and quality.

Finally, other aspects were investigated such as the quality of the separate collection program and quality of the service offered to the citizens inside the SCC.

2. Methodology

2.1. Characteristics of the study area

The questionnaires were administered during 2013 in the town of Baronissi in the province of Salerno, in the Campania region of Southern Italy. The population of Baronissi was 16,820 inhabitants (derived from the databases of the Italian National Institute of Statistics, Istat) with a population density of 942.3 inhabitants/km² (corresponding to an area of 17.85 km²). The town has one principal centre (named Baronissi) and twelve geographical districts (named Acquamela, Aiello, Antessano, Capo Saragnano, Caprecano, Casal Barone, Casal Siniscalco, Fusara, Orignano, Saragnano, Sava). The median altitude is 260 m above sea level.

MSW is collected by means of a separate kerbside collection system. It is separated into the following components: putrescibles for composting (three times a week); paper and cardboard (once a week), glass (twice a month), aluminium and other metals together with plastic for recycling (twice a week); non-recycling residues for RDF production (twice a month); sanitary towels, nappies and

incontinence pads (six days a week); bulk refuses and Waste Electrical and Electronic (WEEE); used clothing and, finally, hazardous MSW. The main peculiarity of the Baronissi system is the frequency of collection for non-recycling residues that is typical of some areas of Northern Italy, like Consorzio Priula, in the Province of Treviso (Contò, 2012). In the Central-Southern Italy, this is a novelty. The adoption of this solution, together with the opening of the SCC, allowed the municipality of Baronissi to improve the percentage of separate collection as well as reduce the waste fee in the period 2010–2012: 5% during 2010, 5% during 2011, 7% during 2012, when the Municipality of Baronissi received a Green Public Procurement Award from the Italian Ministry of Economy and Finance.

Putrescibles and recyclables are sent out of the Campania region due to the absence of treatment facilities (De Feo et al., 2013), while non-recycling residues are sent to a RDF production plant in the town of Battipaglia, in the Province of Salerno.

Each MSW component is directly collected near the home of every resident except for bulk refuse and WEEE which are collected on demand or directly delivered to a unique SCC of the city. In general, due to its position, the SCC is almost entirely used by car owners. Along the path that people usually use to go to the SCC, there are several supermarkets where they go to buy the products that after use become recyclable materials.

Three times per year, the citizens can pick up packs of collection bags containing: biodegradable bags for putrescibles, transparent bags for non-recycling residues, grey bags for paper and cardboard, blue bags for recyclable multi-material (i.e. plastics, aluminium and tinplate), white bags with a red cross for sanitary towels, nappies and incontinence pads. Moreover, the citizens receive containers for the separate collection of glass and cooking oil from the municipality. The cooking oil can be only delivered to the SCC.

The construction of the SCC was completed in 2009, but it was opened to the public only in 2010 due to red tape issues. In Italy, the construction and management of separate collection centres (named “municipal collection centres”) are specifically regulated by the Decree of the Ministry of April 8, 2008, as amended and supplemented by the Decree of the Ministry of the Environment May 13, 2009.

Citizens can directly deliver into the SCC all the MSW separate collection fractions, except putrescibles and non-recycling residues. The SCC, shown in Fig. 1, occupies an area of 3813 m² and is bounded by a fence and a row of trees, useful in reducing the visual impact. Several roll-off collection containers, useful for the temporary storage of MSW fractions both directly delivered by the citizens into the SCC or collected by the operators near the citizens' home, are present in the SCC. Two sheds are used for the collection of urban hazardous waste and cooking oil, respectively.

Table 1 shows the per capita recyclable materials only collected in the SCC in the period 2010–2013 compared with all the material collected in the same period (i.e. Total). The percentage of recyclables in the SCC grew from 6.9% up to 19%, with several materials exclusively collected into the SCC in 2013 (i.e. used tires, bulk refuses and WEEE, debris and inert materials, cooking oil) testifying the important role played by this infrastructure.

An electronic bench scale is present near the office opened to the public to allow citizens to precisely weigh the MSW fractions that they want to deliver: the user puts the bag onto the bench scale and the operator registers the weight into the software system attributing it to the user recognized through the reading of his/her electronic card. As shown in Table 2, the user that directly delivers his/her MSW fractions to the SCC receives eco-points proportional to the quantity collected up to a fixed threshold that varies for each material. This system allows rewarding the virtuous citizens with economic bonuses proportional to the earned eco-points that can be spent in local shops, as shown in Table 3. The

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