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MUNICIPAL WASTE MANAGEMENT BY SAVNO IN EASTERN VENETO

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ABSTRACT

Separate collection (SC) of household waste is an essential instrument to transform the problem of their management into an environmental, economic and social advantage. The purpose of this paper is to present the case of the Savno company, that has an integrated management system (UNI EN ISO 9001:2008, UNI EN ISO 14001:2004, BS OHSAS 18001:2007), and manages the environmental services of 42 municipalities. In particular the case of the municipality of Fregona (Treviso, Italy) is shown. In 2008 Savno adopted in full the so-called "door to door system" (DtD) for the SC of all the commodity-related fractions, with the consequent removal of the street containers, so that people are more responsible towards municipal waste management. This might be applied also to other areas of Italy, avoiding heavy environmental troubles and problems for human health, increasing the efficiency of the offered service and obtaining a control of management costs.

Keywords: Savno, separate collection of household waste, "door to door system", Fregona municipality, integrated management system, ISO 9001, ISO 14001, OHSAS 18001.

INTRODUCTION

The load capacity can be increased through the new technologies, but it can be reduced, in a faster way, through the increasing of the world population (Catton 1986), causing the alteration of the environmental conditions, through the increase of the production of municipal waste (Messineo and Panno 2008). We have to produce better, using less raw material, more secondary materials, producing less waste. Waste can be disposed in landfills, that represents a danger for the environmental pollution and consequently for human health. Incinerators are expensive and the opinions of experts about their environmental danger are controversial, the re-using and/or recycling of the materials is preferable (Buccioli et al. 2015). Sustainable environmental tools are necessary to predict the environmental burden of every waste management system. The Integrated Waste Management (IWM) links up the waste streams, putting together the municipal waste collection (MWC) with the treatment and disposal systems, in order to obtain environmental, economic and social benefit (Thomas 2005).

According to Legislative Decree no. 22/1997, that requires the LCA methodology for the implementation of municipal waste plans, a large number of researchers apply the LCA methodology to understand the best way for waste management and disposal (Eriksson et al. 2005; Lechter and Vallerio 2011; Tarantini et al. 2009; Bovea et al. 2010). In Italy the landfill is losing its important role, while re-cycling and incineration are becoming more important, as suggested by the European policies. Yet the situation in Italy is not homogeneous (Nicolli 2012). Starting from 1999 to 2008, the district of Treviso province, in the North-East of Italy, increased the percentage of selective waste collection (SWC) from 35.4% in 1999 to 68.6% in 2008. In this area we can find the most virtuous municipalities as to municipal waste management (MWM), due to the changing in the waste management policies (Buccioli 2011).

In this paper the case of Savno company, that manages an important number of municipalities of the Province of Treviso, is shown.

BACKGROUND

The Management of Household Waste

An integrated sustainable MSWC system, collection, transportation, processing and disposal, deals with other factors like public participation, policy and legal framework, financial management and appropriate technology. The used technology depends on the local conditions of life, by the economic development and the social change (Shekdar 2009). The techniques for managing waste and solving the problems of their production are different in the various areas of the planet (Bovea et al. 2010; Covanti 2014). A proper MWM avoids adverse outcome for the concerned population: living near landfills, incinerators and composting plants can create potential direct and indirect impacts on human health (Giusti 2009).

Italian Laws

The “Tariffa di Igiene Ambientale” (TIA), instituted with Legislative Decree no. 22/1997, was applied with the Decree of the President of Republic no. 158/1999. TIA provides for the introduction of the assessment of waste production through the volume/weight ratio, in order to calculate the unit tariff using experimental methods, like “accurate method”. Legislative Decree no. 152/2006 provided for a new tariff, TIA2, according to the proper waste production of a single user. The Ministerial Decree no. 201/2011 introduced the municipal tax about waste and services (TARES) able to cover also the costs of the municipal services. In 2014 the Law of Stability instituted the actual waste tax (TARI), on the basis of a medium-ordinary criterion. The Environmental Ministry established that the punctual measurement systems are decided by municipalities in order to take into account the needed service.

The Veneto Region

In 2013, in the Veneto Region, the “Plan for the management of household waste” was approved for exploiting the waste plant capacity of the Region, to pursue a better management of disposal at regional level, defining the not eligible areas, especially the landfills, and promote the knowledge and the research in this field. In this year the Region was the most virtuous in Italy for SC, reaching the interesting value of 64.6% (Ispira 2014).

MAIN FOCUS OF THE PAPER

Aim, Issues

This paper presents the Savno company that manages 42 municipalities of the Piave River area. By adopting a proper system of SC, Savno in the last years has improved constantly the SC percentage and has decreased the management costs, in spite of an increase of the production of municipal waste with an IMS. Our attention is focused on the DtD for the SC of all the commodity-related fractions (not recyclable dry fraction, wet fraction, paper/cardboard, plastic/cans, glass) of the municipality of Fregona (in the province of Treviso).

Savno manages the environmental services of about 300,000 inhabitants, a surface of 932.41 km² and a yearly turnover of about 30,000,000.00 euro. The company was born in 2002, as the operative tool of the CIT consortium (Consorzio dei comuni del bacino TV1), municipality-owned at 90%, because the criticality of the SC of household waste of that area, due to the differences between the 42 involved municipalities: dimensions, living density, geological, social-economic aspects. Furthermore the territory was characterized by different SC, “soft DtD”, “extreme DtD” and street skips, of the various public administrations, each of them with own peculiarities. The company seat is located in Conegliano, in the province of Treviso, where the main administrative activities are carried out, while the operative section is situated at C.A.T.A.V.V. in

Vittorio Veneto, in the same province. Various eco-information counters are present in a capillary way on the territory.

An important task of the company is the environmental advertising campaign through educational interventions, addressed to the students of the primary, secondary schools and to the teachers, meetings, distribution of leaflets, e-mails, articles on the local newspaper directed to foreigners, and the participation to trade fairs with the distribution of eco-sustainable gadgets.

Savno has adopted an integrated management system (IMS) (UNI EN ISO 9001:2008, UNI EN ISO 14001:2004, BS OHSAS 18001:2007). The certification according to the UNI EN ISO 9001 and UNI EN ISO 14001 were achieved in 2008, while the certification according to the standard BS OHSAS 18001 in 2012. The integrate approach can be considered an important starting point for the companies towards the sustainable management. The IMS improves the competitive capacity of the companies and the communications between the stakeholders, in order to save time, human and economic resources (Biondi et al. 2004).

The aims of the IMS in Savno are the planning and technique-administrative coordination of the service of SC of household waste, the service of environmental information, the environmental advice for the realization of eco-compatible buildings, the management of TIA. and the service of eco-counters, the services of collection and transport of municipal waste, special dangerous and not dangerous waste, and at least waste without possession.

From 2012 Savno manages also the special waste coming from the agricultural activities. The territory is rich in agricultural farms and little craft activities producing agricultural waste, also dangerous waste. The agricultural waste have to be managed in a different way as to the municipal household waste. In 2013 Savno managed 140 tons of agricultural waste, not concrete and poles, 60 tons of which were harmful packaging of paper and plastic and 50 tons of empty jars containing phytosanitary products.

In the municipalities managed by Savno an experimental tariff is applied, called "accurate method" which use is possible because the "extreme DtD" system. The tariff consists of a fix part and a variable one. The costs are divided between the domestic uses and not domestic ones, in a percentage established by the municipality, on the basis of the incidence on the total costs of the service. The service "soft DtD" (now adopted in a little number of municipalities) is about the not recycling dry fraction and the organic/green fraction, while the paper/cardboard, plastic/cans and glass are disposed in street skips. The "extreme Dtd" system is adopted for the not recyclable dry fraction, organic material, paper/cardboard, plastic/ cans, glass and green waste. About the domestic uses, the fix part of the tariff depends on the specific use and on the components of the family, while the variable part depends on the number of family components. About the not domestic uses, the fix part depends on the surface in square meters, with a normalization depending on the type of activity (museum, library, schools, associations, cinema and theatre, camping, touristic accomodations...), while the variable part depends on the number of the emptying of the container of dry matter.

The amount of urban waste collected by Savno in 2013 was 103,548 tons.

Method or Approach

Data and information, relative to the case study, were collected by interviews with the managers of Savno company.

RESULTS AND IMPLICATIONS

The “soft and extreme DtD” system of SC

In 2002, when the company arose, the situation about the waste of that area, concerning the collection, the waste disposal and rating, was not homogeneous. CIT created a company, Savno, with the clear aim to improve TIA, organizing the service in order to increase the efficiency of the system in the perspective of eco-cheapness. In fact from 2008 Savno, with the collaboration of the municipalities, has instituted a revolutionary waste management, introducing the “extreme DtD” system of SC about all the commodity-related fractions, after an advertising communication, with the collaboration of citizens, giving up the “soft DtD” system. Every container was equipped with a “transponder”, allowing the application of TIA through the registration of every emptying of the skip. The users pay more attention to the conferred waste in the various containers and the SC is more suitable in order to reach high interesting value, if compared to the Italian average. The containers, different for dimensions and colour, were given to the users in gratuitous loan. The “extreme DtD” system is the most valuable and effective, if compared with the “soft DtD” one. The transition from a system to the other allowed the reaching of better results in the SWC. In fact Savno reached 82.3% of SC in 2013, while SC covered 66.5% in 2005 (Figure 1), exceeding the value of 70% of SC provided by the New Regional Municipal and Special Waste Plan, adopted with the Decree no. 264/2013 of the Council of the Veneto Region.

Figure 1. Savno SWC (%) (2005-2013)

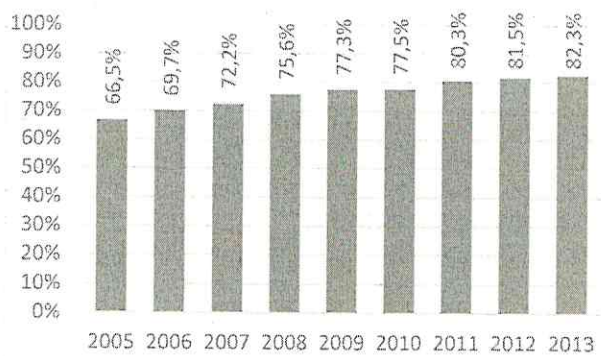
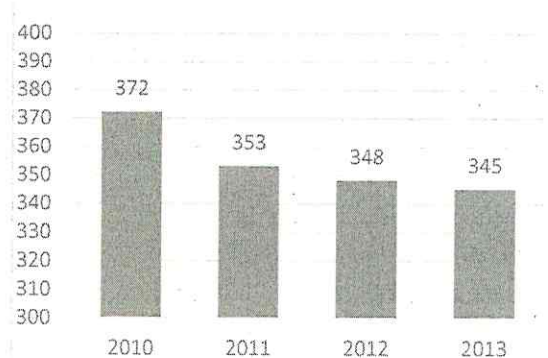


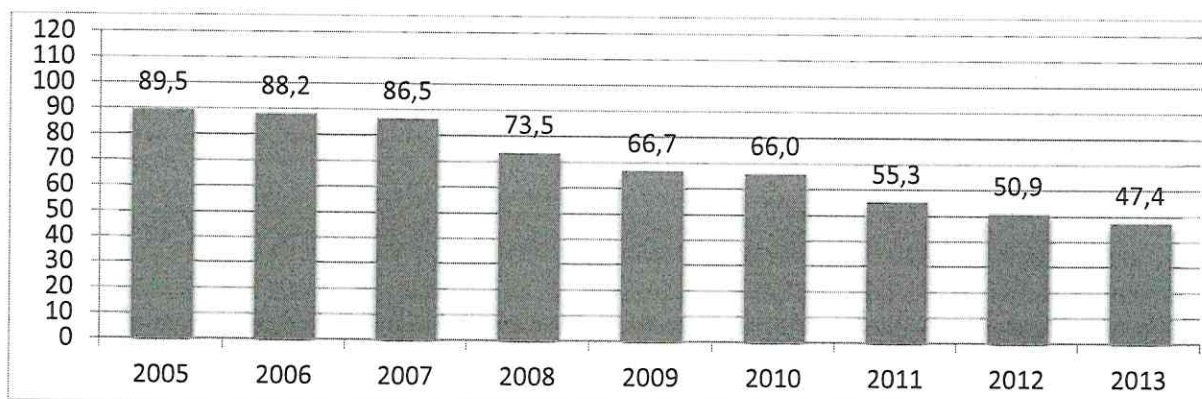
Figure 2. Savno total MW production per capita (kg) (2010-2013)



Source: Savno 2013, interview with W. Catellan

The consequences of this SC translate into a virtuous behaviour: a less production of total MW per capita, from 372 kg in 2010 to 345 kg in 2013 (Figure 2). The users, because of the consciousness to pay for the real service, pay more attention to the SWC. Another result is represented by the quantity of dry waste per capita that goes from 89.5 kg in 2005 to 47.4 kg in 2013 (Figure 3).

Figure 3. Savno dry waste production (kg per capita) (2005-2013)



Source: Savno 2013, interview with W. Catellan

Interesting results, comparing the data of SC as regards the extraneous material in collected plastic/can, and in paper, obtained with the “soft DtD” and the “extreme DtD” system, are shown in Tables 4 and 5.

Table 4. Extraneous materials in plastic/can collected by Savno (% on average) (2009-2013)

% extraneous material in plastic/cans	2009	2010	2011	2012	2013
“soft DtD system”	43,2%	40,3%	37,7%	42,3%	53,1%
“extreme DtD system”	20,6%	16,0%	18,2%	21,1%	22,9%

Source: Savno 2013, interview with W. Catellan

Table 5. Extraneous materials in paper collected by Savno (% on average) (2009-2013)

% extraneous material in paper	2009	2010	2011	2012	2013
“soft DtD system”	11.6%	10.4%	12.6%	14.6%	16.7%
“extreme DtD system”	2.2%	2.9%	2.5%	2.6%	2.7%

Source: Savno 2013, interview with W. Catellan

The Municipality of Fregona

The municipality of Fregona has decided to assign the 82% of the costs to the domestic uses and the 18% to the not domestic ones. The percentage of the fix part and the variable one for the different uses is the same, deriving from the society financial plan; the cost for every emptying per family component is 15.077 euro, while the cost for the emptying of a 120-litre container is 13.08 euro, for both the uses.

The municipal waste production of Fregona is quite constant, while the percentage of SC increased year by year, from 72% in 2010 to 74% in 2012. The production of dry waste per capita went from

60 Kg in 2010 to 63 kg in 2012. The analysis of plastic materials highlights a percentage of discarded part of 22% in 2012, corresponding to a contribution by Conai of 48.22 euro/ton, the second level of merit. This means that Savno, even if has reached important goals in the SWC, from the point of view of the quality, but also of the quantity, can operate in order to obtain a better contribution for the collected fractions.

FUTURE RESEARCH DIRECTIONS

In the last decades integrative methodologies were applied to manage the municipal waste streams. The policy decisions to take about the MMW are of great interest in order to improve the concept of sustainable development. For the future development of the topic it would be important to joint system assessment tools like Environmental Impact Assessment (EIA), LCA and the analysis of material flux, with some models able to assess the global warming potential, to try to preserve the energy and natural resources, with the goal of achieving a sustainable waste management. A system analysis would be carried out utilizing other environmental instruments like carbon and water footprint, in order to help the policy decision about (Pires et al. 2011). According to the many LCA scientific papers about the IMWS, in order to improve the efficiency of the adopted SC system, a LCA could be carried out to better understand the environmental consequences of MWSC by Savno.

CONCLUSION

The opinion of Savno management during the XVI legislation of the Senato of the Italian Republic in February 18, 2009, stated that the application of this modality of SC in that area was satisfactory because of the results obtained, 70% of SC, if compared with other Italian realities. The implementation during the years of “extreme DtD” system of SC by Savno has allowed to achieve more sustainable and important values. Better results could be reached if the purity of the collected fractions (i.e. plastic/can, paper) would be increased. Furthermore a higher gain could be obtained by the selling of the materials to the associations of spinneret.

The waste management offers great potentiality to recycle materials, to increase the use of renewable energies, to improve the life conditions, preserving nature and biodiversity.

The case of Savno company might be applied to other areas of Italy, avoiding heavy environmental troubles and problems for human health, increasing the efficiency of the offered service and obtaining a control of management costs.

REFERENCES

- Biondi, Vittorio, Daniele Ferrero, and Emilia Pellizzari. 2004. *Qualità, ambiente, sicurezza e etica*. Milano: Franco Angeli.
- Bovea, Maria Dolores, Valeria Ibanez-Fores, Antonio Gallardo, and Francisco-Josè Colomer-Mendoza. 2010. Environmental assessment of alternative municipal solid waste management strategies. A Spanish case study. *Waste Management* 30: 2383-5.
- Buccioli, Alessandro, Natalia Montinari, and Marco Piovesan. 2015. Do not Trash the incentive! Monetary incentives and waste sorting. *The Scandinavian Journal of Economics* 117 no. 4: 1204-29.
- Catellan, William. 2014. Personal communication, March 15.
- Catton, William. 1986. “Carrying Capacity and the Limits to Freedom”. Paper prepared for Social Ecology Session 1, New Delhi, India: XI World Congress of Sociology, August 18.
- Covanti, Stefan, 2014. “Comparison between the German and the Italian waste management system- a focus on waste pretreatment to achieve landfill stability”. Master Diss. Technische Universität Dresden, http://tesi.cab.unipd.it/49733/1/Tesi_Covanti_Stefan.pdf
- Decree no. 264/2013 of the Council of the Veneto Region. Piano regionale di gestione dei rifiuti urbani e speciali, anche pericolosi.

Eriksson, Ola, Reich Carlsson, Bjorn Frostell, Ana Bjorklund, Getachew Assefa, Jan-Olov Sundquist, J. Granath, Andras Baký, and Lennart Thyselius. 2005. Municipal solid waste management from a systems perspective. *Journal of Cleaner Production* 13: 241-52.

Giusti, Lorenzo. 2009. A review of waste management practices and their impact on human health. *Waste Management* 29: 2227-39.

Ispira. 2014. Rapporto rifiuti urbani.

Jacobsen, Ray, Jeroen Buysse, and Xavier Gellynck. 2013. Cost comparison between private and public collection of residual household waste: multiple case studies in the Flemish region of Belgium. *Waste Management* 33: 3-11.

Lechter, Trevor M., and Daniel A. Vallerio. 2011. *Waste: A Handbook for Management*. Amsterdam: Elsevier.

Legislative Decree. 1997. February 5, no. 22. Attuazione delle direttive 91/156/CEE sui rifiuti, 91/689/CEE sui rifiuti pericolosi e 94/62/CE sugli imballaggi e sui rifiuti di imballaggio.

Legislative Decree. 2006. April 3, no. 152. Norme in materia ambientale.
http://www.isprambiente.gov.it/files/pubblicazioni/rapporti/RapportoRifiutiUrbani2014_web.pdf

Messineo, Antonio, and Domenico Panno. 2008. Municipal Waste management in Sicily: practices and challenges. *Waste Management* 28: 1201-8.

Ministerial Decree no. 201/2011. Disposizioni urgenti per la crescita, l'equita' e il consolidamento dei conti pubblici.

Nicolli, Francesco. 2012. Convergence of waste-related indicators of environmental quality in Italy. *Environmental Economics and Policy Studies* 14: 383-401.

Pires, Ana, Graca Martinho, and Ni-Bin Chang. 2011. Solid waste management in European countries: A review of systems analysis techniques. *Journal of Environmental Management* 92: 1033-50.

Shekdar, Ashok V. 2009. Sustainable solid waste management: an integrated approach for Asian countries. *Waste Management* 29: 1438-1448.

Tarantini, Mario, Arianna Dominici Loprieno, Eleonora Cucchi, and Ferdinando Frenquellucci. 2009. Life Cycle Assessment of waste management systems in Italian industrial areas: case study of 1st Macrolotto Prato. *Energia* 34: 613-22.

Thomas, Bernie, and Forbes McDougall. 2005. International expert group on Life Cycle Assessment for integrated waste management. *Journal of Cleaner Production* 13: 321-6.

Vaccari, Mentore, Veronica Di Bella, Francesco Vitali, and Carlo Collivignarelli. 2013. From mixed to separate collection of solid waste: benefits for the town of Zavidovici (Bosnia and Herzegovina). *Waste Management* 33: 277-86.