The Zero Waste System - An Enduring Solution for the Waste Management in Romania?

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EXECUTIVE SUMMARY

The issues of the municipal waste management are some of the most important challenges which most municipalities confronts with in Romania, taking into consideration the increased quantities of waste, the environmental constraints, the new technologies.
As the number and complexity of municipal waste management alternatives increase, the selection of the waste management systems that will best serve the present and future needs of a community becomes a more difficult task.
The implementation of a Zero Waste System in Romania raises a number of issues.
The research question of this paper is: "It is possible to implement a Zero Waste System in Romania?".
This paper discusses whether the Zero Waste System, representing a new way of thinking and of establishing practices in the field of waste management, could be implemented in Romania.
Four reasons could be invoked in support of the implementation of the new waste management system in Romania: fulfilling the obligations associated with the transition periods; meeting the EU requirements; an unsustainable pattern of resource consumption and waste generation; international recognition of the Zero Waste System.
On the other hand, four objections to introducing a Zero Waste System in Romania have been raised: precarious infrastructure for the waste management; weak involvement of the public; the complexity of the implementing process; lack of experience.
The research makes use of various types of qualitative and quantitative data collected from different sources such as publications, statistics, surveys, but we also rely on elements of action research (including personal experience and observation).
In carrying out this paper, maintaining objectivity has been an area of constant concern. We are aware that as Romanian citizens, we may be prone to displaying a certain degree of bias in our analysis.
The paper is structured in four sections. The first section presents the waste management practice in Romania, the picture of the situation in 2007; we used the most recent statistical data available during the research. The second section highlights the main reasons supporting the implementation of a Zero Waste System in Romania, followed by the main barriers (in the third section) and the conclusions of our analysis (in the last section).

The sustainable use of natural resources and waste management are environmental problems rooted in the way Romania uses its land, in its economic structure and citizens' way of life.
This paper reveals that a Zero Waste System is desirable (it could be an effective way which corresponds to the Romanian waste management) and its implementation in Romania is possible (there are feasible solutions to the envisaged obstacles).
In conclusion, our study recommends the introduction of a Zero Waste System in Romania although the implementation process will not be either easy or straightforward.

INTRODUCTION

This paper discusses whether the Zero Waste System, representing a new way of thinking and of establishing practices in the field of waste management, could be implemented in Romania.
Our study presents the main reasons supporting the implementation of the Zero Waste System in Romania, as well as barriers associated with this process.
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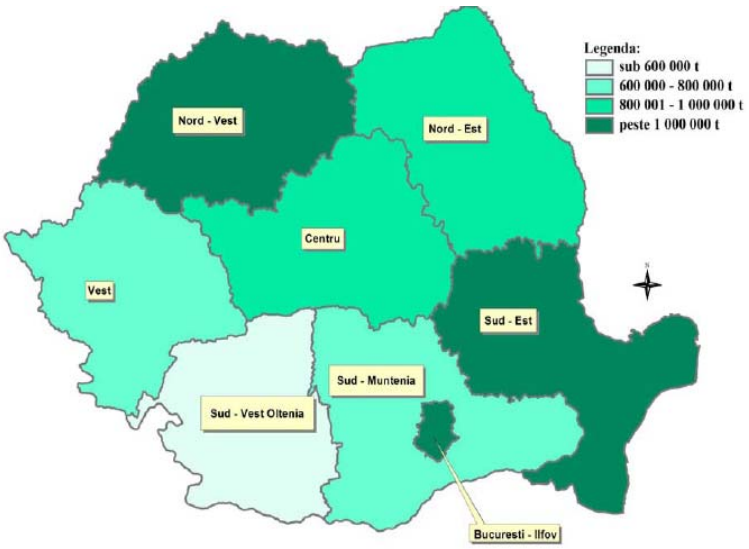
WASTE MANAGEMENT PRACTICE IN ROMANIA

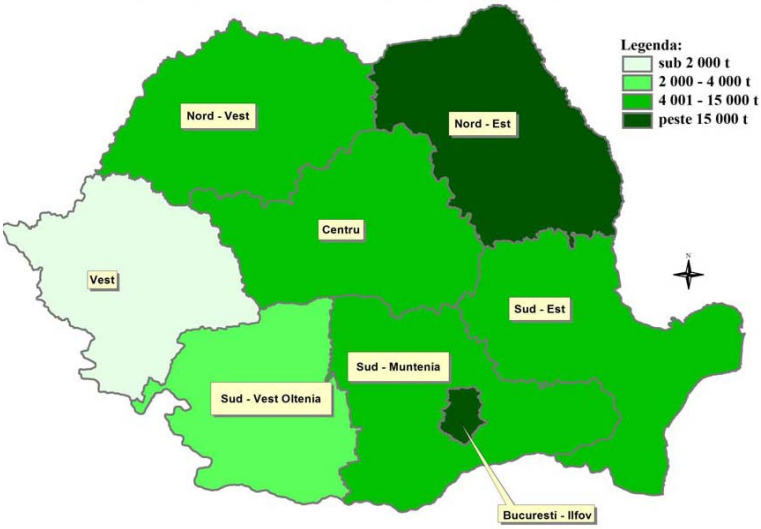
Romania, an average-size country comparatively with other European countries, having an area of 238,391 km^2 (the 13th country in Europe by size) and a population of about 21.53 million inhabitants (according to statistical data for 2008),EU member since 2007, is facing a great challenge to bring its waste management system in line with EU Directives.
The waste management in Romania is currently undergoing some changes, but the picture of the situation in 2007(we used the most recent data available during the research), is the following:
- in 2007, the total quantity of waste generated in Romania was 281.200 thousand tonnes, of which 99.85% is non-hazardous waste.Hazardous waste generated, according to the categories of waste in the European list of waste is about 0.15% of total waste (Ghergut et all, 2009)
- in 2007, the amount of municipal waste collected by the specialized services of municipalities or sanitation companies was about 6922 thousand tonnes
- **the quantities of municipal waste collected by development regions** (from the administration point of view Romania is divided in 41 counties.In order to reach the basic objectives of the regional development policy, were created 8 development regions(by the Law No. 151/1998): North -West, North -East, South -East, South Muntenia, Bucharest-Ilfov, South-West Oltenia, West, Center) **are presented in the figure 1**. The largest quantity of municipal waste (over 1,000,000 tons) is collected in the development regions: Bucharest-Ilfov (15.53%), North-West (15.34%) and South East (15.23%).Development Region that collect smaller quantities of municipal waste (under 600,000 tonnes) is South-West Oltenia (5.91%) (figure 1)

Figure 1 - Quantities of municipal waste collected by development regions (Ghergut et all, 2009, pp. 10)



- the quantities of municipal waste recovered by development regions are ilustrated in figure 2 Approximately 1% of municipal waste collected were recovered.The largest amount of municipal waste recovered (37.07%) is found in the region of Bucharest-Ilfov.Almost 54% of the household waste collected separately and recovered are paper and cardboard.

Figure 2 - Quantities of municipal waste recovered by development regions (Ghergut et all, 2009, pp. 11)



- Around 99% of the total municipal waste collected, are eliminated by landfilling.The largest quantities of waste are stored in the North-West (15.38%), Bucharest-Ilfov (15.30) and South East (15.29%) regions
- Inadequate waste management has led to a large number of landfill sites that do not meet the standards laid down in the EU Landfill Directive
- The waste management in Romania is also characterised by : the need for high levels of investment in physical infrastracture (sorting plants, recycling and treatment facilities, complying landfills); a weak cooperation between the wide range of stakeholders (local authorities, NGOs, service users, private formal and informal sector, etc); the lack of waste management services in communes and villages, excepting those located near the towns; failing to link waste reduction to the local economy; insufficient support rendered by competent state bodies to private sector; top-down public decision making in an era of increasing public suspicion and right to know; a dynamic policy arena.
- The National Strategy on Waste and the National Plan of Waste Management in force, certify that in Romania there is the necessary framework for the development and implementation of a sustainable waste management system. Since April 2007, Romania has a new instrument in the

waste field: The Regional Waste Management Plans. These plans have a key role in the development process of the waste management. However, improving the waste management system will no doubt need more than legislation to succeed.

THE ZERO WASTE SYSTEM DRIVERS IN ROMANIA

There are **four main reasons** that support the implementation of the new waste management system in Romania.

Fulfilling the Obligations Association with the Transition Periods

Firstly**,** Romania has to fulfill certain obligations concerning waste on environment chapter 22 negotiated with the EU.

The European Union granted Romania transition periods in the waste management field, for : Packaging and Packaging Waste (Directive 94/62/EC, modified by the directive 2004/12/CE),Waste landfilling (Directive 99/31/EC), Waste incineration (The Council Directive 2000/76/EC),Electrical and electronic waste (The European Parliament and The Council Directive 2002 /96 /CE, modified by Directive 2003/108/ CE),Import, export and waste transit (Regulation 259/ 3/ CE).

The need for these transition periods is due to deficiencies recorded in the field: precarious infrastructure for waste collection, transport and elimination; the permissive regime of environmental standards application, exploitation and manufacturing of non-renewable resources with inefficient technologies; the high number of sites damaged by pollution caused by economic activities and unsuitable landfill of waste, etc.

According to the Accession Treaty Romania-European Union Romania **should attain** : **the recycling target for plastics** by 31 December 2011 in accordance with the following intermediate targets: 8% by weight by 31 December 2006, 10% for 2007, 11% for 2008, 12% for 2009 and 14% for 2010 (similar recycling targets are for glass, paper, wood, etc); **the overall rate for recovery** or incineration at waste incineration plants with energy recovery by 31 December 2011 in accordance with the following intermediate targets: 32% by weight by 31 December 2006, 34% for 2007, 40% for 2008, 45% for 2009 and 48% for 2010; **the gradual reduction of waste landfilled** in the 101 existing noncompliant municipal landfills in accordance with the following maximum quantities: 3 240 000 tonnes by 31 December 2007, 1 210 000 tonnes by 31 December 2016,etc.

To reach the above mentioned objectives, is necessary to change the present practices regarding waste.

Havel M. (2006) shows in his study, using practical examples from the Central and Eastern European countries (Bulgaria, Czech Republic, Hungary, Slovakia, Latvia), that the Zero Waste System provides: the basis for reformulating policies for waste management, and procedures resulting in significant reduction of the amount of waste deposited to landfills.

Meeting the EU Requirements

The second reason refers to the fact that some of the Zero Waste System elements such as : extended producer responsibility, financial and tax reform, and clean production, are already required by the current European Union legislation.

As an EU member since 2007, Romania also has the obligation to meet these requirements. One trigger which enforces a closer involvement of Romanian actors into the above activities is corporate social responsibility (CSR) - “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis” (COM, 2001). At Romanian governmental level, European Union is one of the most important promoters of CSR which consecutively hand over to all its members the mission to act responsibly towards economy, environment and society as a whole.

Even though 94% of the Romanian company’s representatives have expressed agreement with the statement “beside gaining profits a company should be involved in the development of the community in which it operates” (Stancu and Olteanu, 2008), there are low evidences that CSR is treated in a different manner than an image-builder instrument or a source of competitive

advantage. Corporate social responsibility in Romania is therefore still in its infancy. Multinational companies are the ones that set the trend in this field, because of their corporate culture. But, even so, few companies publish CSR reports or include in their annual report their CSR activity. Companies use CSR as a tactical instrument, and this is the reason why most of CSR projects in Romania are on short term. Mass media and NGO's are not very active in promoting the CSR concept.

Extended Producer Responsibility (EPR) is thus a necessary step, if the industry is to become a more responsible and trustworthy corporate citizen. As a market-oriented policy instrument, when applied to products that have reached the end of their useful lives, EPR requires procedures to internalize waste management costs, creating an incentive for them to redesign products that will reduce material use and improved energy efficiency and recyclables (Lin et al., 2002). EPR is generally applied to post-consumer wastes which place increasing physical and financial demands on municipal waste management (Wiedmann and Lenzen, 2006).

According to Rossem et.all (2006) effective implementation of EPR should bring the achievement of two main environmentally-related goals, namely: **design improvements of products** (in this sense the EPR system should provide incentives for manufacturers to improve products and systems surrounding the life cycle of products) and **high use of product and material quality through effective collection and re-use or recycling.** The latter goal can be also sub-divided into three sub-goals, which are: effective collection, environmentally-sound treatment of collected products and high use of products and materials in the form of re-use and recycling.

To get to a zero waste system we need to change the rules: design policies that create financial incentives for business to recycle more and generate less waste; ban toxic products, landfill taxes; and use "pay-as you throw" schemes, whereby householders pay directly according to the quantity of waste they generate.

International Recognition of the Zero Waste System

Thirdly, successful programs worldwide are already moving towards the Zero Waste System. It is the conclusion of a study by Hill, Hislop, Steel & Shaw (2006), which present the zero waste initiatives worldwide. Table 1 summarizes the main Zero Waste initiatives.

Table 1 Zero Waste initiatives

Location	Goals	Instruments	Achievements	Future
Canberra , Australia	No-waste by 2010, meaning 95% recycling	Landfill pricing	73% recycling	Recycling remaining 5%; more producer responsibility
Kamikatsu, Japan	Zero waste Declaration, meaning no waste to landfill or incineration by 2020	Separation of waste into 34 different streams; Zero Waste Academies to gather and disseminate expertise	75%-80% of household waste is recycled or composted	
New Zealand	Zero Waste by 2020 goal, meaning no waste to landfill or incineration	Strong preference for voluntary instruments; landfill tax and by –laws also used in some areas	Little data on overall recycling rates, some districts successfully using Zero Waste goal to drive grassroots initiatives	Better waste generation data; continued emphasis on education
San Francisco , USA	Zero Waste to landfill by 2020; 75% diverted from	1990 State legislation: 50% diversion from landfill by	67% recycling rate	Producer responsibility, addressing consumer

	landfill by 2010	2000		culture
Flanders , Belgium	Residual per capita waste should not be more than 150 kg in a year	Variable charging for collection of household waste based on weight or volume; producer responsibility for some waste streams; landfill bans/ high tax	In 2004 , 71% of all municipal solid waste was recycled or composted;	Shifting the focus to waste prevention and reduction
Bath and NE Somerset , United Kingdom	Zero waste goal not an absolute goal, a framework within which to develop initiatives; interim target of 50% recycling of household waste by 2020	No specific instruments beyond Landfill Tax/ Directive. Emphasis on education and training	37% recycling of household waste, one of the highest rates in UK.Kerbside collection from all households	Focus on arresting the growth in waste despite predicted population increase in the area

Source: Hill et al.(2006) An International Survey of Zero Waste Initiatives, Green Alliance

According to Jessen (2003, pp.89) Zero Waste System represents a new planning approach for the 21st Century, which defines "the discipline required to create a more sustainable interaction with our natural world, including the principles of conserving resources, minimizing pollution, maximizing employment opportunities, and providing the greatest degree of local economic self-reliance."
The GrassRoots Recycling Network indicates that the following policies and actions will be needed to move us towards zero waste (Jessen, 2003, pp.89): **producer responsibility**- producers must share responsibility with consumers for recovering their products and ensuring that they are recycled and not wasted**;** also producers need to contribute to the „closing the loop" process by using the materials collected in local recycling programmes to manufacture new products; **unit pricing for trash** – residents and businesses need to be given the incentive to reduce waste and recycle through variable garbage rates**; invest in jobs through reuse and recycling –** waste prevention and recycling provides tremendous opportunity to create jobs and initiate new business ventures; **end cheap waste disposal**; **campaign finance reform-** much of the resistance to changing resource policies comes from the industry that profit from wasting,etc.
Zero Waste System is an attainable aim, and an increasing number of states, towns, municipalities and companies all over the world are gradually joining this movement.

An Unsustainable Pattern of Resource Consumption and Waste Generation
The fourth reason refers to the fact that in Romania (the 13th country in Europe by size) resource consumption and waste quantities are high, exceeding the carrying capacities of the natural environment (SOPE,2007).Actions as exploitation and manufacturing of non-renewable resources with inefficient technologies, the permissive regime of environmental standards application, the low level of investments for environmental infrastructure, non-including the environmental externalities in costs, led to a gradual degradation of the environment**.**
In order to improve this situation in Romania it is necessary that both natural resources and waste to be managed in a sustainable manner.
The Zero Waste System has multiple aspects, including resource conservation and environmental protection. Taken together these provide a new way of approaching waste issues. Instead of solving the problem of what to do with the produced quantities of waste, one must concentrate especially on

the issue of how to reduce the total volume of waste and also how to manage more wisely the natural resources in Romania.

THE MAIN BARRIERS TO INTRODUCING A ZERO WASTE SYSTEM IN ROMANIA

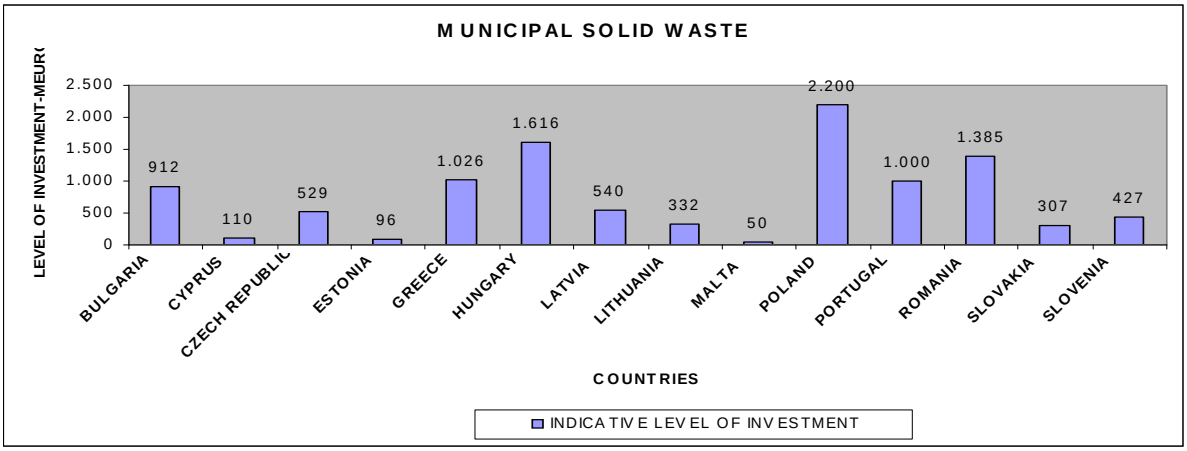
On the other hand, a number of counter-arguments for the implementation of the Zero Waste System in Romania could also be mentioned.

Precarious Infrastructure for the Waste Management

A first objection for introducing the Zero Waste System in Romania refers to the low level of investments for environmental infrastructure in Romania.

According to the report entitled " The Strategic Evaluation on Environment and Risk Prevention ", carried out by Ecolas&GHK in 2006 on behalf of the European Commission, the need for investments in the municipal waste management field, for 2007- 2013, places Romania on the third position after Poland and Hungary (figure 3).(SOPE, 2007, pp.18)

Figure 3 Overview of investments needs for municipal waste in the new Member States for 2007 - 2013



Because the needs for direct environmental investments to comply with the EU legislation are particularly high, Romanian authorities opted to create a specific operational programme focused on environmental infrastructure, but dealing with other environmental issues as well.

On July 12, 2007 the European Commission approved the operational programme for the environment for 2007-2013,cofinanced by the European Regional Development Fund (ERDF) and Cohesion Fund (CF).The total budget of the programme is around EUR 5,6 billion and the Community assistance amounts to EUR 4,5 billion(MEMO,2007:pg1).

Consequently, in order to reduce this obstacle, we can start elaborating viable project proposals, taking into account the specific features of each Romanian region. In this sense, the experience gained by some local authorities in the development of investment projects financed by PHARE and ISPA can be used. Lessons learned, positive and negative, should be disseminated to all stakeholders involved in the process of waste management.

The most important lessons are presented in summary below :

-planning long-term investment is essential and should take into account : the principle of sustainable development, the prioritization of investments based on transparent criteria, the correlation with other programs in the region in order to maximize the results.

-the institutional mechanism for implementation of the projects must be clear, it is necessary to define clearly the role and responsibilities of various actors in the system

-cofinancing must be part of the project preparation

-a good preparation of the projects is a long term process, especially in the case of infrastructure projects, any omissions or errors in the preparation phase will be paid during the implementation stage

Weak Involvement of the Public

A second objection against the proposed waste management system relies on the observation that, at present at least, there is a weak awareness of the citizens and economic agents about sustainable waste management. In Romania, the attempts of authorities to educate and mobilize civil society have not yet produced satisfactory results.

The international best practices show that a public campaign must be a permanent part of the implementation of the Zero Waste System.

In order to reduce this barrier, we can design programmes to educate people about the sustainable waste management system and to encourage the teaching of pro-environmental attitudes at all levels. There is a need for widespread programmes of public education. Without a tradition of civic responsibility, this task is made more difficult, but has a crucial role to play in the success of the implementation of the new system.

Some NGOs have initiated or are involved in organizing such programmes, like:

LIFE AFTER COLLECTION – a programme initiated by the NGO " Mai Mult Verde" and Coca Cola HBC Romania, that encourages citizens to engage in the selective collection and recycling of waste, by requiring to the local authorities from their area, the extension of the selective collection system. In this sense, any citizen can download from the project website www.viatadupacolectare.ro a standard format letter.

At the end of campaign the results will be centralized in a document entitled "The Green Charter of Environmental Volunteers". This charter will contain the list of all volunteers, the petition signed, the list of all localities taken into account, also an official request addressed to the Ministry of Environment and Sustainable Development, which will be presented in a public conference.

RECYCLING MOVEMENT – a national project initiated by the Ministry of Environment and Sustainable Development in collaboration with Romanian Society of Television, which aims to educate the public about recycling (packaging, WEEE and other waste)? The project is supported also by private sector and NGOs (Dacia, Rompetrol, Ursus, Vega Hotel, Environ Association and Sten DTM).

The cities that are part of the Recycling Movement route, during four months (June-September 2009), are Galati,Iasi, Sibiu, Cluj, Brasov, Craiova, Constanta, Vama Veche, Costinesti, Mamaia, Timisoara and Bucharest.The cities will host concerts, competitions and street events for the public. Recycling Movement activities are promoted through communication campaigns conducted at national level through TV channels, radio, print and online.

SRTV (Romanian Society of Television) will host a series of televised debates about recycling and environmental protection.

VERDIS - an educational project initiated by the NGO "MaiMultVerde" in collaboration with ECO TIC Association, which aims to persuade pupils of the gymnasium and high- school about the benefits of the selective collection and recycling. In this programme are involved 20 schools and high-schools from Bucharest, Cluj, Brasov, Iasi and Galati.

VERDIS comes to show that even the youngest of us can do something for the environment.

Programmes like the above mentioned can contribute to a significant shift in attitudes or action regarding waste and recycling, enabling the implementation of the Zero Waste System.

The Complexity of the Implementing Process

A third objection refers to the fact that the implementation process of the Zero Waste System in Romania is not easy. It requires: significant time, attention to diverse material streams, public involvement.

In order to overcome this barrier, it is necessary to determine the period (years) in which we can achieve this objective and plan the implementation of the Zero Waste System in several stages, taking into account the specific features of each Romanian region. In this sense, we can use the experience gained by the teams involved in the development of the Regional Waste Management Plans and of investment projects financed by PHARE and ISPA.

Firstly should be considered for each city or area an audit of the current waste system, namely: the waste quantities generated in time and space, the characteristics of these waste, the specific features of the area (level of economic development; existing urban infrastructure: street network, transportation systems, sanitation; degree of education and responsibility of the population; technology available), etc.
After the audit of the current waste system is finalized, we can estimate with a better accuracy the period (years) in which this objective is achievable (according to Havel M.(2006) this concerns a period of 15 to 20 years).
As mentioned before, the permanent involvement of the public is a key element of the process. We can realize the public education and participation by: intensive campaigns in the media, lectures, notice boards on municipal authorities, issuance of a leaflet for each household, competitions for schools/ high schools/ universities, and by promoting and supporting projects for the prevention of production of waste.
The international best practices show that the implementation of Zero Waste System requires an engaged public willing to question conventional economic wisdom and political practice.

Lack of Experience

A fourth point of contention relies on the fact that there is not enough experience with the Zero Waste System, which may raise serious problems regarding the implementation process. However, it could be argued that the experience needed could be acquired from other Central and Eastern European countries, which have already adopted the Zero Waste System.
In their studies, Havel M. (2006) and Murray R. (2002) show that the replication of the Zero Waste System can be realized successfully if it is properly managed.
Romania can benefice of the expertise of the countries which successfully implemented the Zero Waste System. A compelling example in this sense is the case of the municipality of Palarikovo which reduced the amount of wastes deposited to a landfill by 75 % within 6 years.

CONCLUSION

The sustainable use of natural resources and waste management are environmental problems rooted in the way Romania uses its land, in its economic structure and citizens' ways of life.
This paper reveals that the implementation of the Zero Waste System in Romania is desirable, it could be an effective way which corresponds to the Romanian waste management, and its implementation in Romania is possible in several stages. In this sense, the recommended improvements could facilitate the new waste management system implementation in Romania**.**
This study represents a fairly small intervention, only a beginning; further research is required in the following directions: measuring the real impact of the implementation of the Zero Waste in Romania, the way that CSR can bring forward the extended producer responsibility. Companies should act more environmentally-wise and disseminate the results of the CSR activities they are involved in, in order to gain the trust of stakeholders through a transparent and accountable attitude. They have also to follow up responsibly their products during the entire lifecycle, which will result in economic, ambient and reputation yields.
The endeavour to incorporate the philosophy of sustainable development in any national or local development strategy is essential for Romania to cope with the requirements of, and fit into, the complex world we live in today.

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