

WASTE MANAGEMENT – THEORY AND PRACTICE. STUDY CASE: RAISING AWARENESS CAMPAIGN IN CLUJ-NAPOCA SCHOOLS

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ABSTRACT. Population can get involved in waste management process if proper educated in adequate acting towards products one uses, especially when it becomes waste. Furthermore, their involvement can improve by learning how to collect their waste in a selective way. Taking these aspects into consideration, the paper presents a raising awareness campaign that was developed in schools from Cluj-Napoca City and its results. It aimed to teach pupils theoretical and practical aspects regarding waste management and especially good practices in selective collection of waste, as a first step in recycling and other type of material recovery. *“Be green for the environment. Learn to select your waste”* was a project that joined forces of private companies, students and also public authorities in order to improve environmental aspects by increasing young population involvement in waste management process. In order to have a better perspective upon social reality – young people’s knowledge and behavior related to waste management process, the survey method based on questionnaires was used. The obtained data were statistically processed. The questionnaires applied to pupils during the project highlighted the fact that pupils are not aware of their role in waste management process although they have basic knowledge on the issue. The supervising period of the way schools that took part to the project collect they waste showed that they are more aware of that, as institution, fact that gives pupils a good example and platform to improve their behavior in this matter.

Key words: *waste management, selective collection of waste, raising awareness campaign*

INTRODUCTION

EU imposed targets in waste management

Awareness, at high level, of the importance of recovery and recycling waste on the environment and non-renewable resources has increased in the last decades all over the world so environmental policy has developed considerably in that

direction. However, the assumed obligations on those issues, as a result of becoming an EU member state, reduction of municipal waste that is being disposed in landfills and recycling and recovery targets represent quite a challenge for Romania.

A recent study developed in 2012 on waste management performance of UE member states showed that Romania has “major deficits in waste treatment according to the hierarchy and compliance with the Landfill Directive, the application of economic and legal instruments and waste management planning as well as prevention policy” (BiPRO, 2012). The study took into consideration 18 criteria and the overall score obtained by Romania was 11 from the maximum of 42 taking (BiPRO, 2012).

National objectives and targets for the recycling and recovery of packaging waste are established by Government Decision no. 247/2011 that amends Government Decision no. 621/2005 on the management of packaging and packaging waste that regulates the management of packaging and packaging waste. For 2012 and 2013 these targets are listed below (table 1).

Table 1. National Recycling and Recovery Targets
(Government Decision no. 247/2011, 2011)

Year	Minimum recovery target through material recycling					Recycling (%)	Recovery (%)
	Paper and cardboard (%)	Plastic (%)	Glass (%)	Metals (%)	Wood (%)		
2012	60	18	54	50	15	50	57
2013	60	22,5	60	50	15	55	60

According to waste hierarchy presented by Waste Framework Directive the priority order used in waste prevention and management legislation and policy is as follows: (a) prevention, (b) preparing for re-use, (c) recycling, (d) other recovery, e.g. energy recovery and (e) disposal (European Parliament, 2008).

A target to reduce with 15% the amount of collected municipal waste that is disposed to landfill was introduced by Environmental Fund Law, since 2010. In case of failure, the public local authorities have to pay 100 lei/ton on the difference between the target established and the target actually achieved through selective collection and recovery (Romanian Official Monitor, 2010).

Moreover, as a measure of raising the degree of selective collection of waste, public institutions are required to set a selective collection system for the following types of waste: paper, cardboard, plastic, metal and glass following the adoption of Law 132/2010. The financial penalties start from 500 lei and may get up to 10.000 lei (Romanian Official Monitor, 2010).

Furthermore, Government Decision no. 247/2011 provides fines that ranges between 600 lei and 1.000 lei for natural person and a fine between 10.000 and 20.000 for public institutions, associations and foundations for non-compliance with the fact that packaging generators of waste are required to selectively dispose their packaging waste in different containers, labeled accordingly, specially installed by the local public authorities (Romanian Official Monitor, 2011).

In order to motivate selective collection of waste, Cluj-Napoca Municipality established a 25% discount for selective collection of waste. Moreover, General Council of Bucharest Municipality developed a Decision Project that was supposed to increase the sanity tax with 50% for owners' association and a 25% discount for selective collection of waste (Preda, 2011).

Need of education programs on selective collection of waste

However, besides a well-developed policy on that matter, a proper working waste management processes depends on many actors. On local ground this actors are represented by public authorities, environmental protection authorities and companies providing waste management services including: collection, transportation, selection, recycling, landfilling and other waste treatment operations.

Moreover, population has a very important role in waste management process at the very beginning of this complex process. If educated, waste generators can play an active role in prevention and reducing waste by pre selecting waste, action that facilitates waste recovery.

Population involvement in waste reduction is a very important aspect especially if taking into consideration the fact that besides deficiency in waste legislation approaching, polluting emissions as a result of improper waste management, negative impact of waste upon environment, constant increase in waste volume is the most stringent problem related to waste management (Soporan *et al.* 2011).

Furthermore, the success of population involvement in waste management process, besides presence of proper infrastructure, depends on:

- The awareness degree regarding selective collection – its importance regarding environmental protection, natural resources conservation and biodiversity protection and its economic advantages

- The way population perceives waste management process as a whole

- Legal constraints and their application

Furthermore, the role of population in reaching the imposed targets for waste recycling and recovering is even more important if taking into consideration the fact that in Romania research highlighted that only 40% of packaging are found in industrial network and the rest of 60% are used by population (Regional Plan of Waste Management, North-West Region, 2007).

In Cluj-Napoca city and not only, there is a lack of educating programs regarding waste management, waste selective collection and its advantages. This leads to a serious lack of correct attitude among Cluj-Napoca citizens regarding these aspects and their involvement in waste management in general.

Moreover, lack of educating programs regarding environmental protection in relation to waste management, leads to wrong attitudes that are extended among young population as well.

This deficiency in population education indirectly results in:

- Increased quantity of waste that is not collected selective
- Increased quantity of waste that cannot be sorted in order to be recycled or recovered; if collected together, the humid fraction of waste contaminates the solid fraction of waste especially paper waste and makes it difficult or impossible to recycle.

- Increased quantity of waste disposed in landfills
- Impossibility to accomplish EU imposed targets concerning recycling and waste recovery
- Possibility of infringement procedure in the field of waste legislation to be issued by EU

MATERIALS AND METHOD

Therefore, a sanitation company, other private companies involved in waste management, students learning environmental sciences, a local NGO and also public authorities joined forces in order to make a difference in young population mentality and education regarding waste management.

These efforts resulted in a raising awareness campaign developed in schools and high schools from Cluj-Napoca City during scholar year 2011- 2012 whose *main objective* was to increase pupils training on selective collection of waste.

The campaign was initiated by a sanitation company that prepared the informational support and also developed a strategically network that included experience and information from other companies involved in waste management especially waste electric and electronic equipment and packaging waste.

After the logistical background including agreements with School Inspectorate was established, students learning environmental sciences were trained so that at the end they could train pupils from elementary school and high school. This training consisted in practical and theoretical knowledge on waste management system, environmental issues, importance of selective collection of waste and recycling.

Moreover, students were also trained on project management by an NGO specialized in training people, so that students learn to develop similar projects from scratch.

Main target of the campaign is young population because it is easier to form a mentality, the one of pupils and students, than to change the one of adult population. Moreover, it was considered that through young population that maintains the correct learned habits inside their families, a bigger segment of population is covered.

The first step of the project, developing a framework for the campaign itself, consisted in developing partnerships, designing and achieving advertising and informing materials – flyers, promoting objects (badges and recyclable pencils) and training students regarding waste management and project management.

The campaign named *“Be green for the environment. Learn to select your waste”* aimed to improve pupils’ practical and theoretical skills through interactive discussions based on a power point presentation, held by assigned persons on behalf of the sanitation company and by students.

The main topics of the discussion were: environmental impact of waste disposals, stages and actors involved in waste management in Romania, with examples on Cluj-Napoca City, good practices in waste selective collection, importance and advantages of waste recycling and waste selective collection infrastructures in Cluj-Napoca City.

Furthermore, in order to have a better perspective upon social reality – young people’s knowledge and behavior related to waste management process, the survey method based on questionnaires was used. The obtained data were statistically processed.

RESULTS AND DISCUSSIONS

The project implemented in Cluj-Napoca City reached pupils from 18 schools and high schools.

The campaign itself was developed on three segments: collecting information, training and monitoring.

Collecting information

At the beginning of each interactive discussion, pupils were given to answer a questionnaire that wanted to highlight how many information and skills do pupils have on waste management and what were their expectations on selective waste management system.

Therefore, over 400 pupils aged between 10 and 18 years old, 3rd-11th grade’ pupils, (fig. 1.), answered the given questionnaire on waste management.

As shown in the graph below majority of the respondents were represented by high school students.

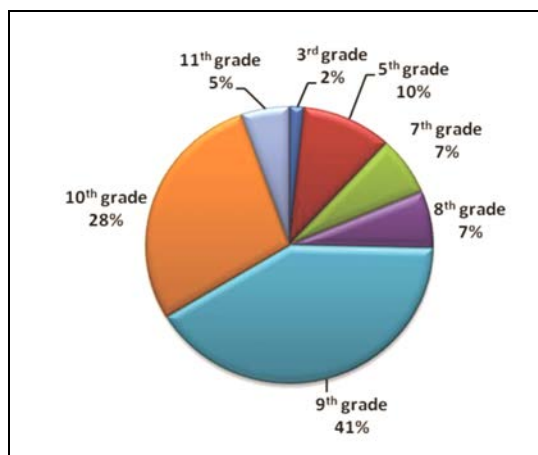


Fig. 1. Respondents’ affiliation to educational system grades

The purpose of the questionnaire was to highlight respondents’ knowledge regarding the process of waste selective collection, their habits in this perspective but also their perception on the actual implemented system. Furthermore, having a framework on pupils’ knowledge, skills and perception on waste management helped

trainers find out what aspects should emphasize in their discussion with pupils in order to try to change their behavior so that they can make a difference in collective selection of waste.

The responses at the first question aimed to highlight pupils' knowledge regarding the term "selective collection of waste" fact showing that only a very small percent were not familiar with the concept and more of them were high school students (figure 2).

Furthermore, respondents had basic knowledge regarding waste selective collection as they knew that paper, plastic, metal and glass are the main waste materials being selected from the waste (figure 3) with possibility of recovery and recycling.

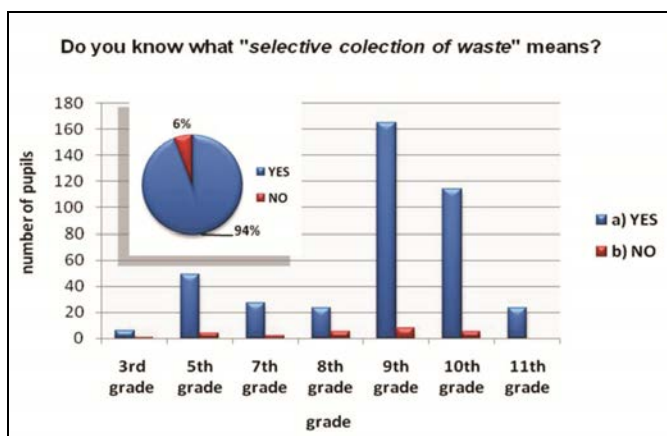


Fig. 2. Degree of knowledge on the term "collective selection of waste" in pupils' view



Fig. 3. Pupils' knowledge regarding waste material being collected selectively

As the targets for WEEE (waste electric and electronic equipment) recovery set by environmental policy are quite high, pupils were also asked whether they know that WEEE can be recycled. Their answers showed that only a small percent of the respondents – 24 percent were not aware of that (figure 4).

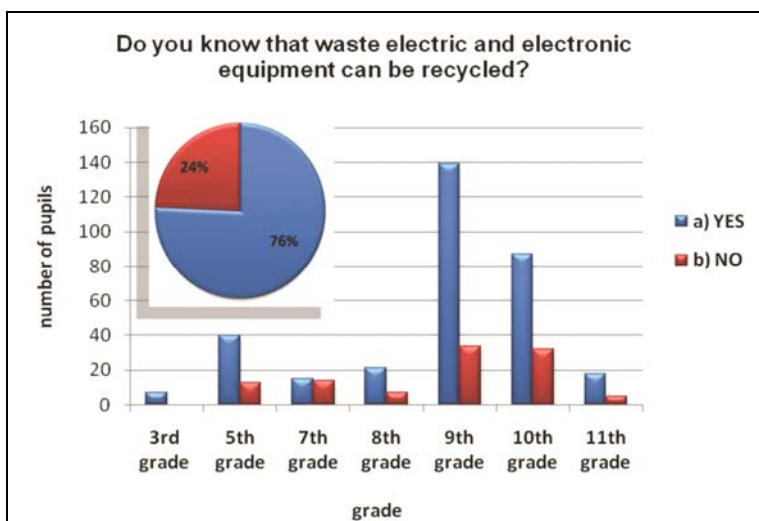


Fig. 4. Pupils' knowledge regarding WEEE recycling

If the age of respondents is considered, it had been observed that the older they are, respondents tend to motivate the fact that they do not select their waste with arguments that highlight the fact that it is not their responsibility.

Free answer questions could reveal much better pupils' opinion and perspective on selective collection of waste their reasons for not getting involved and aspects that would motivate them into changing their behavior.

Although they believe that selective collection of waste is either important or very important (fig. 5.), 32 percent of the respondents said that they do not collect selectively their waste at home or at school (fig. 6.). Their reasons for not selecting their waste were quite diverse. These included:

- Not having enough time
- Lack of interest
- Someone else do it for them
- Lack of time
- Not being used to it
- Lack or little special places for selective collection of waste
- Implication of lots of work
- Environmental protection is not one of their special interests
- The fact that it is easier to throw it all together
- It is not their job, there are people paid to do that

These answers indicate the fact that respondents are not aware of their obligations regarding selective collection of waste, overestimate the amount of time and effort needed for this activity and are not aware of the environmental implications of it.

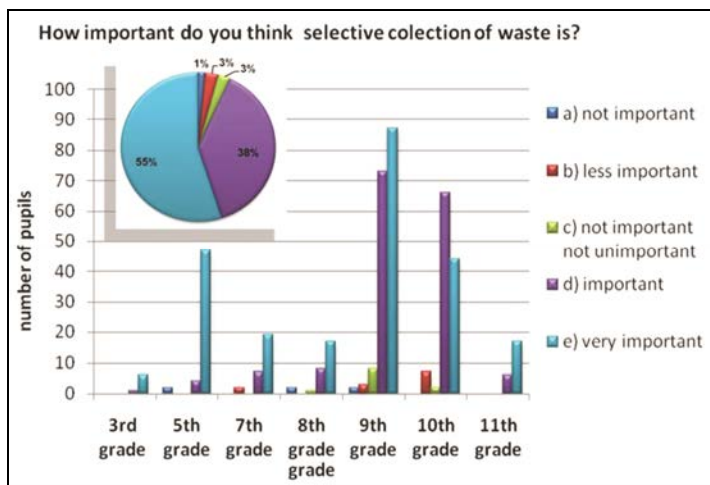


Fig. 5. Importance of waste selection in pupils' view

When asked what would motivate them to select their waste their answers were quite diverse:

- Laws that makes selective collection of waste compulsory for population and stipulate fines for not selecting the waste;
- More special places for waste that is collected selectively;
- A rewarding system (money or other prizes);
- Knowing the advantages of selective collection of waste;
- An overall practice in Romania;
- Certainty that waste materials being selectively collected are being recycled;
- Possibility to by interesting and useful products made from recycled materials

Furthermore, there were respondents answering that nothing could motivate them to select their waste.

Most of the ones that select their waste motivate its actions with reasons like:

- Environmental protection;
- Healthy environment;
- Clean nature;
- Care for the environment;
- Minimizing pollution caused by waste disposals;
- Facilitates recycling process;
- Waste can be useful if collected selectively;
- Waste can be recycled or recovered if collected selectively;

- Reading on this subject;
- Being forced by others (e.g. mother);
- Own conscience;

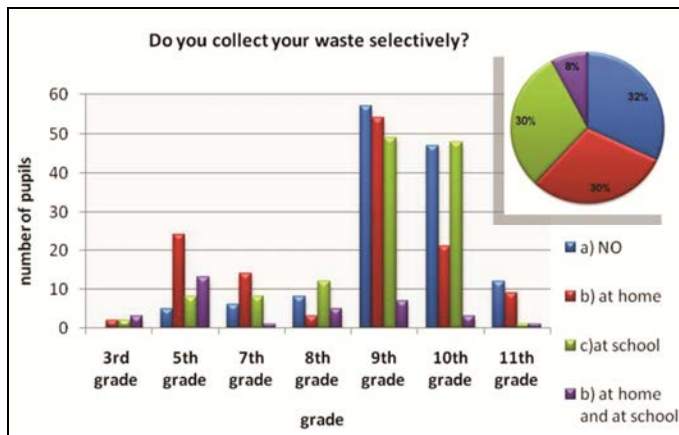


Fig. 6. Waste selective collection of waste among pupils

Training

Interactive discussions based on a power point presentation and distribution of informative materials on waste management (fig. 7.) were the chosen methods to try to change young people's behavior regarding their involvement in waste management system and to improve their skills on that issue.



a) poster

b) flyer

Fig. 7. Promoting materials of the raising awareness campaign “Be green for the environment. Learn to select your waste”

Students that activated in an NGO on environmental issues, first trained on waste management in Romania with examples on Cluj-Napoca city, together with specialist from the sanitation company developed interactive discussions with pupils from schools and high schools.

At first, they established comprehension of terms like waste, selective collection of waste, recycling, recovery and waste management so that everyone had the same knowledge.

The main debated issues were:

- “Waste as monsters” - the negative impact of waste deposits upon each of environmental elements (soil, water, air and organisms health including human health);

- “Opportunity given by waste materials” or what materials can be recycled or recovered, with examples;

- Waste management as a process and the priority order in waste hierarchy: prevention, preparing for re-use, recycling, other recovery, e.g. energy recovery and disposal (figure 8);

- Main actors involved in waste management process and their role highlighting waste generators involvement in preventing through responsible consumption and reusing and waste selective collection;

- Practical issues related to waste selective collection – what are the main materials being collected separately in order to be recycled, facilities from Cluj-Napoca city;

- Importance of a proper waste management system and practical reasons that would change young people’s behavior related to selective collection of waste, such as: energy, resource space and money saving, environmental protection, sustainable development and creating new jobs;

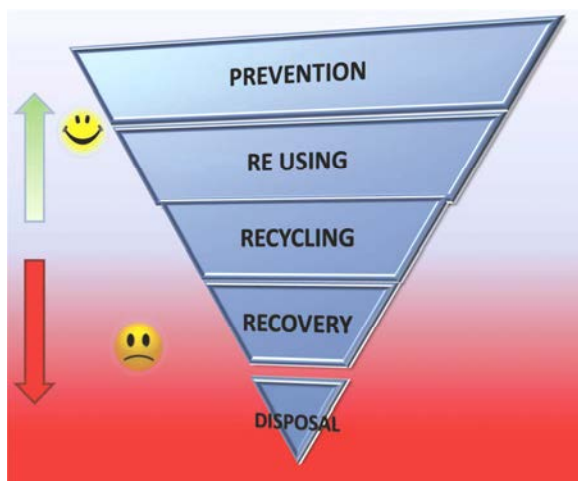


Fig. 8. *Waste hierarchy*

Throughout the discussions with different aged children and adolescents there had been observed that younger children were more receptive and got more involved than the older ones.

Monitoring

The project was well received in schools and teachers took part at the discussion as well so the information reached also to the administrative board. Considering that schools as public institutions are required by law to select their waste, the project also had a monitoring stage that indicated the fact that over 70 percent of the schools that participated in the project collect the waste selectively (figure 9).

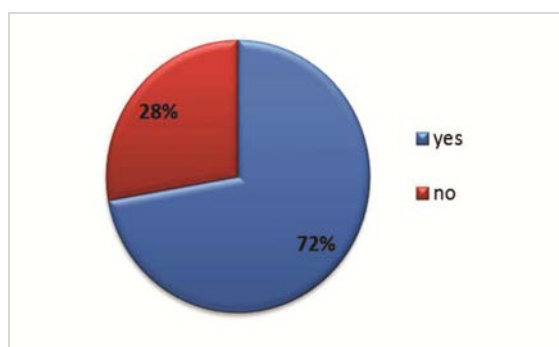


Fig. 9. Percent of schools and high schools that collect selectively their waste

CONCLUSIONS

The raising awareness campaign reached to more than 1800 pupils from Cluj-Napoca City schools and high schools. They learned theoretical aspects related to waste management, environmental impact of waste disposal sites, and practical issues related to selective collection of waste – how to do it and its importance on a small and bigger scale.

Over 400 pupils aged between 10 and 18 years old were questioned regarding their knowledge on waste management issues. It resulted that pupils are not aware of their role in waste management process although they have basic knowledge on the issue. Moreover, the study identified reasons for not collecting selective, that can help improving the system and make it accessible for people.

The project involved students activating in an NGO on environmental issues; together with specialist from the sanitation company, students helped training pupils from schools and high schools on people involvement in waste management. Moreover, it turned out to be a sustainable one because of the fact that students taking part were also trained on project management issues so they will have the possibility to develop similar environmental projects on their own.

Pre and after project monitoring of the selection of waste in schools showed that more than 70 percent of the institutions taking part to the project improved their waste management system.

Although it implied relative small resources the project had significant contribution in waste selective collection system especially because of the fact that informative material can be assumed by teachers and discussed at different classes even out of the project.

Furthermore, the project has a great potential of being extend in the same institutions but also in other learning institutions like kinder gardens.

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