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IMPLEMENTATION OF GREEN MARKETING IN THE ANALYSIS OF MUNICIPAL WASTE PRODUCED IN ROMANIA, CORRELATED WITH ENVIRONMENTAL POLICY MANAGEMENT

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Abstract

This study has an exploratory character, aiming to perform an analysis of the manner to approach the green marketing and the activity of selective collection of waste in Romania. The objectives of this study are indissolubly linked to the fact that currently, Romania does not develop a marketing strategy in terms of waste management. By processing data regarding the municipal waste situation from national and European level, we aim to provide a picture of the actual situation, based on which there can be designed a series of managing policies for this type of waste. The importance of the study that we submit to attention stems from the corroborated analysis of the information relating to waste collection in Romania and Europe but also from the SWOT analysis of the factual situation.

Key words: green marketing, littering, recycling, selective disposal, waste management

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1. Introduction

The problem of waste management in Romania is manifesting increasingly acute because of the increase of its quantity and diversity, as well as its negative impact, more pronounced on the environment (Hamer, 2013). The urban and industrial development of communities and the overall growth of the living standard of the population involve the production of increasingly larger quantities of waste.

By the variety of inorganic and organic substances contained, these make the process of aerobic and anaerobic degradation by microorganisms to be difficult to drive, causing, in case of evacuation and uncontrolled storage, pollution of soil, air and water (Ghinea et al., 2012; Ianos et al., 2012).

In this context, the literature highlights the fact that, unlike other types of waste, municipal waste is generated by households, commercial activities and other sources whose activities are similar to those of households and companies. So, the main differentiating feature is that they are composed of residual waste, bulky waste, secondary materials from selective collection (e.g., paper and glass), dangerous household waste, waste from street cleaning and litter trays.

Therefore, one can speak, in the case of municipal waste, of potential impacts associated with the disposal of waste, including leachate and gas generation (with powerful greenhouse gases), odours, insects, vermin and the use of land for waste deposits with a direct effect on community residents (GD 856, 2002; Ianos et al., 2012; Pohontu et al., 2010).

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In other words, municipal wastes represent the totality of waste generated in urban areas and rural households, institutions, commercial, economic agents (domestic waste and assimilable) street waste collected in public spaces, streets, parks, green spaces as well as waste from construction and demolition collected by salubrity operators (EC Directive, 1975; EC Directive, 1999; Gázquez-Abad et al., 2011).

As defined by Leopold et al. (2011), we refer to waste from construction and demolition as those resulting from construction activities, renovation, rehabilitation, repair, building, demolition of civil, industrial construction, urban structures, the transport infrastructure as well as drainage activities and clogging. According to the National Agency for Environmental Protection, in the structure of municipal waste in Romania, the household waste has the largest share (about 81%), while street waste and construction and demolition waste have about the same proportion - 10% and 9%. Over 90% of these wastes are eliminated through storage (http://www.anpm.ro/ro/deseuri).

Regarding waste disposal in landfills we have to specify that the waste accepted for disposal are: household waste, non-hazardous commercial and industrial waste, construction and demolition waste, waste from gardening (agricultural). Waste disposal is done in compliance with the environmental legislation in force. According to European standards and legal requirements in environmental protection, the companies should constantly invest in preventing pollution, it promotes recycling thus reducing the quantity stored, and where there is no possibility to recover and to revaluate the waste, we provide services for waste storage in different regions of the country complying with EC Directives and the Government Decision (although subsequent amendments thereof) and applying strictly and with reliability criteria and procedures for the acceptance of waste at landfills (EC Directive, 1975; EC Directive; 1999; Law 211, 2011).

The municipal waste management involves the collection, the transport, its recovery and disposal, including the post-closure monitoring of waste deposits. Another important aspect concerning this type of waste management is represented by the transposition of the Community acquis relating to environmental protection in national legislation and its implementation represents one of the main challenges facing Romania in the accession process to the European Union. In this context, the activity of littering represents one of the important issues within the policy of environment protection, the efforts made being encountered in the area of harmonization of the national legislation with the European Union legislation.

2. Material and methods

For the present study, we started from the detailed analysis of data concerning waste situation in Europe, based on official statistics provided by the competent institutions of the European Union (http://ec.europa.eu/eurostat/web/waste). The official statistics, according to Law 226 (2009), cover all the activities organized for the collection, processing, analysis and dissemination of statistical data, statistical culture development, the creation and management of official statistical data series conducted by public authorities and institutions. This represents the result of individual data processing by the producer of official statistics, in accordance with the statistical law or other legislative acts. All data are published as required by the official regulations. According to the National Institute of Statistics, among the producers of official statistics in Romania used for the development of the present study we mention: The Ministry of Environment and Climate Change, The National Administration Romanian Waters, The National Environmental Protection Agency, The Ministry of Regional Development and Public Administration.

Regarding the methodology for collecting and processing data from the official statistics, the legal framework in Romania is established by MO, (2010), implementing the methodology of environmental impact assessment for public and private projects.

Data processing was performed using the SPSS program, applied today due to the strong components available for data management (selection, reconfiguration, creating new data) and for data documentation (there is a metadata dictionary that retains characteristics of the data) (http://www-01.ibm.com/software/ro/analytics/spss/). Moreover, it can be added flexibility regarding the types of data accepted as the module to build reports, which implicitly leads to the accuracy of information that will result from processing. For graphing activities and for data forecasting it was used Excel.

Data processing of official statistics related to the European situation was corroborated with the Romanian situation, situation drafted from the analysis in detail of the data available about the manner of waste handling in Romania, thus it was achieved the analysis of the various types of waste at national level. Following this thorough study we made a forecast, illustrated by a series of graphs representing the evolution trend (positive or negative) regarding the collection process, treatment and recycling of waste in order to obtain energy recovery on the background of global ecological imbalance and specificity of the activities undertaken in the context of sustainable development in Romania (National Statistical Institute, 2007).

The main difficulty encountered in research refers to the collection of information on national data concerning managing waste, requiring extra supported effort, and this because Romania does not have a very well developed system of quantification and tracking of the quantity of waste and the way of its treatment, the official existing data are at the level of the years 2010-2011.

3. Case study

The analysis of all available information was done in a structured manner, from general to particular. Thus, the study is structured as follows: in the first stage, we analyzed the situation at EU level; in the second stage we have done the analysis of the situation at national level, in the context of the obligations arising from the fact that Romania is an EU member state; in the last part we brought into attention a prediction of the situation emerging on the basis of official data.

The data analysis at European level, provided by the official statistics through Eurostat, had been carried out in a comparative way, on geographical areas of Europe. Thus, in Fig. 1, there is presented the comparative situation of collection, treatment and recycling of waste in different European regions, compared to the situation in Romania. From the data analyzed, we highlighted the fact that Romania is the largest producer of waste in its area and, for most of waste the treatment is represented by burial in the ground or valorization by other methods than getting energy.
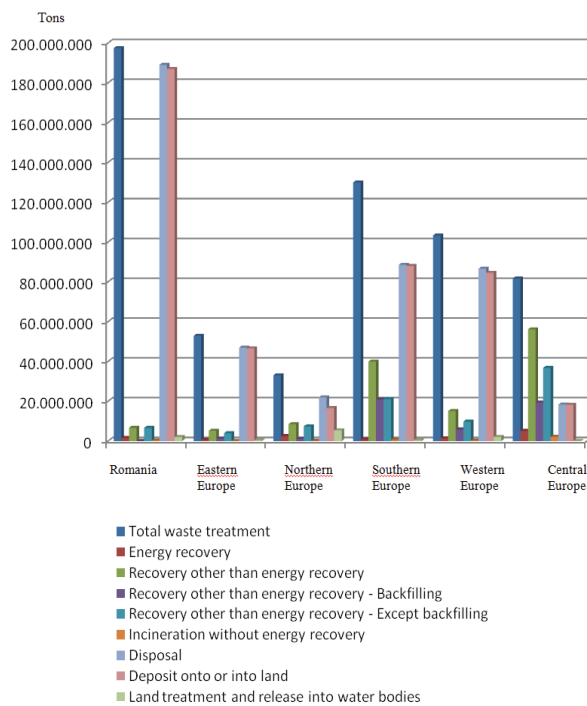
Fig. 1. A comparative situation regarding the disposal, treatment and recycling waste in Europe by comparison to Romania (adapded upon www.epp.eurostat.ec.europa.eu)

A comparison to other European states, showed us that the high quality of life in Scandinavian states, for instance, is also reflected in the quantity of waste generated. One may easily notice that, by comparison to the quantity of waste produced by Eastern Europe, the quantity generated by Scandinavian states is virtually half. Also, even though Scandinavian states are generating a comparatively lesser amount of waste by comparison

to other areas, most of it is recycled and reused, by converting it into energy, or by composting, useful for soil treatment for increased productivity (Butti, 2012; Ghinea et al., 2012; Schiopu and Ghinea, 2013).

By studying the situation in Western Europe, we arrived at the conclusion that, even though the quantity of waste generated in that area may be slightly over the European average, in the majority of cases their retrieval is done either ecologically, or by recovering energy. According to the data provided, both France and England are at the higher end regarding the quantity of waste generated (www.epp.eurostat.ec.europa.eu). In our opinion, the causes that have led to the aforementioned situation is the increased number of immigrants that entered Europe in the early `80s. It seems that some of them lack concerns on issues related to minimizing the quantity of waste produced.

Concerning the issue of waste in central Europe, Germany is the largest producer, whereas as opposed to countries like Turkey, Bulgaria, and Romania, most of the waste generated by Germany is being converted in either fertilizers for agricultural lands or into energy (www.epp.eurostat.ec.europa.eu).

Compared to other European countries, the separate collection of municipal waste for recovery in Romania is practiced to a small extent, to local level, in pilot projects initiated by sanitation companies and municipalities, in cooperation with economic operators. This situation is, in fact, the reason for which the general impression is that Romania is the largest generator of waste among EU Member States. However, waste generation is relatively normal in reality, but the ability to recycle, recovery and management of these wastes is under development.

Another important aspect that is reflected in the quality and quantity of official data provided to the public is that the responsibility for municipal waste management belongs to local authorities which, individually or by sanitation service concession to an authorized economic operator should ensure selective collection, transport, neutralization, recovery and final disposal of this waste, implicitly the official reporting to relevant institutions is not made unitary. The concept of the collection is defined by GD 621 (2005), which regulates the collection of packaging waste by types of material and/or assortments of materials. The concept of reuse of waste is regulated through Law 211 (2011), which refers to any operation by which packaging has been conceived and designed to accomplish within its life cycle a minimum number of trips or rotations is refilled or reused for the same purpose for which it was designed. Valorisation of waste involves the processing of waste already formed. Recovery measures should facilitate increasing the lifetime of the waste in the economic cycle or its reintroduction in this circuit. Waste recovery measures as those to avoid their formation can lead to a quantitative and qualitative reduction in

the quantity of waste removed, so both types of measures can be considered complementary. When it comes to waste disposal we refer to any operation which is not a recovery one, even if one of its secondary consequences would be the reclamation of substances or energy (according to Annex 1 of Law 211, 2011).

The first part of the study made on waste situation in Romania is based on data regarding sources of waste collected in the year 2009. In Fig. 2 we showed that volume of plastic waste in rural areas is four times higher than that in urban areas, most of the plastic waste consisting of PET bottles). Besides plastic waste, the rural area holds the supremacy, also in the case of glass waste, metal and textiles, but with smaller percentages than plastics. This is due mainly to the fact that there is no public awareness for recycling. Besides the ecological component, recycling would make possible to get an advantage from a financial point of view. In the absence of some clear policies, waste will continues to represent only "garbage".
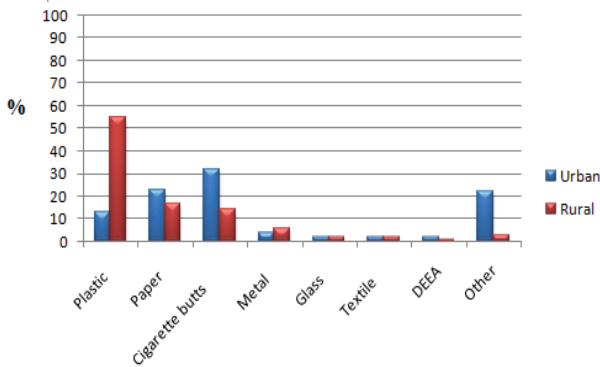

Fig. 2. The comparative situation of waste disposal, rural/ urban areas, as of 2009 (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

Fig. 3 illustrates the situation of waste collected by littering activity in 2010 in Romania. About half of the waste collected is made of PET. In the absence of special facilities to recycle these, PET bottles continue t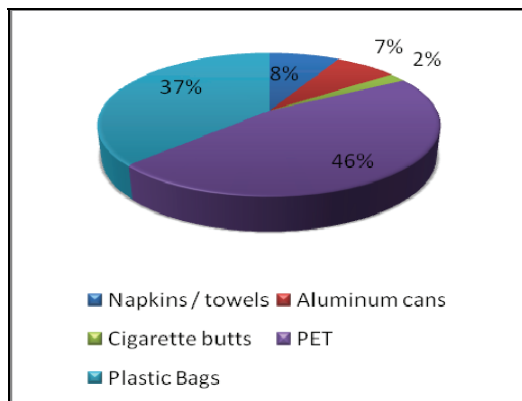o act as the waste with the strongest effect on the environment. The plastic bags are sistuated on the second place as environmental impact, since they are preponderantly not bio-degradable, and require a very long time to be degraded, as in the case of PET bottles. If PET bottles and bags are considered the waste with a high environmental impact, through Fig. 4 we reveal the arrangement of plastic categories of the waste collected. More than one third of plastic waste collected is in the form of packaging. Unlike other countries where through government involvement the packaging tends to be as eco as possible (paper, textile bags, reusable glass bottle) in Romania there are no such policies put in place, so that packages, whose content is exhausted, are no more than money thrown at the trash.

The highest percentage in the plastic waste category is that of packaging. This type of packages may be easily replaced with alternatives, in the sense that plastic bags may be replaced with either biodegradable plastic, or paper. A less than 20% of packages are represented by food packages, signifying a more comfortable process of replacing them with other types of materials (textile, or paper).

However, the change also assumes a process of both education and awareness; in urban areas, awareness campaigns focused on the threat posed by waste in general, and is easier to implement, by comparison to rural areas, where implementing similar campaigns is much more difficult. An encouraging fact is that figures are pointing to a decline in the amount of plastic waste by 2015. To develop a suitable policy, the business sectors, the residents of certain geographic areas, the customs, etc. in a certain area of Romania would expect initiatives from local authorities, in their capacity as authority of the mentioned aspects, towards national authorities in their role as coordinators of policies.

In this respect, one of the questions of the study conducted by the Centre of Excellence for Sustainable Development based on which the littering intake for 2010 was drawn, has regarded also the local authorities' opinion regarding municipal waste generation.
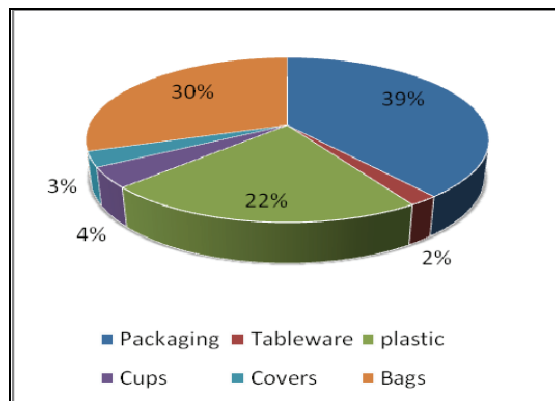

Fig. 3. The situation of most harmful to the environment waste in Romania, in 2010 (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

Fig. 4. The situation of plastic waste, classified on ategories, collected in Romania in 2010 (adapted upon www.anrsc.ro, www.anpm.ro, ww.statistici.insse.ro)

The results revealed that 93% of the representatives of the authorities realize the fact that, starting from the premise that through municipal waste we understand the totality of waste generated in urban and rural households, institutions, commercial establishments, businesses (domestic waste and assimilable), street waste collected in public spaces, streets, parks, green spaces, construction and demolition waste collected by disposal operators (www.anrsc.ro), there is generated a large quantity of municipal waste indeed (Chen et al., 2011; Ianoş et al., 2012; Wilson et al., 2011).

As part of the structure of municipal waste in Romania, household refuse prevails (about 81%), whereas street litter and construction/demolition debris are of approximately the same percentage- 1%, and 95% respectively. Over 90% of that sort of waste is being disposed of by storage (www.anrsc.ro).

Considering all these factors of influence and *de facto* situation in Romania, we argue that although on the short term, the main waste management option will be further storage, the goal is to promote sustainable management options and ensure consistency with European practices, so as to avoid, where possible, final disposal solutions (storage, incineration). Promoting these upper management options and ensuring alignment with European Union there comes amid the following facts: the amount of municipal waste generated will increase due to increased consumption of goods to the public, which is estimated at 0.8% year/capita. Based on the quantities of waste expected to be generated and given the objectives set for the expansion of the collection and the implementation of selective collection, there were estimated quantities of waste that will be collected and the quantities of waste which are to be collected separately. Given this situation, we appreciate that municipal waste represents a technical problem solved only after the company will assume the important role in the separation, reuse, recycling and composting, and the industry will give the appropriate attention to re-design of the system, so that products can be reused or recycled.

For the basic prognosis regarding the quantitative evolution of municipal waste, we have considered the major factors, such as: the demographic evolution; the economic progress; the connection to sewage/purging centralized systems; the building operations forecast; the changes in consumer's behavior, the environmental education, the living standards (Korhonen et al., 2004; Omran and Gavrilescu, 2008; Wang et al., 2008). Even though on short and medium term, storage would continue to be the chief option for waste management, the objective is to promote better management solutions as well as adapting local practices to European practices, mainly that of avoiding as much as possible the solution of disposal by either incineration or storage (Ioan and Carcea, 2010; Korhonen et al., 2004; Melosi, 2005).

Municipal waste is an issue that may only be solved technically when our society will learn to play a role in selective disposal, separating, reusing, recycling and composting waste, whereas the industry would take sufficient focus on planning in advance, so that most products should be either reused or recycled. The quantities of municipal waste generated shall increase, due to the increase in the population consumption, the latter being estimated at 0.8% annually per capita (Consonni et al., 2005).

Starting from the quantity of waste that we estimate as possible to be generated, and considering the objectives that were set regarding the expansion of the system of disposal and the implementation of selective collection, we were able to estimate quantities of waste that would be collected, as well as quantities of waste that would be collected selectively. In support to our statements, we illustrated in Fig. 5 the situation of locations endowment, in order to be possible to collect waste selectively. Three quarters of the locations for waste collection have no equipment and endowments to collect selectively. Only 17% of these locations allow selective collection and most of these locations were arranged in this idea by accessing European funds. In this context we must find practical and pragmatic solutions to allow selective collection. Beyond the fitting material for this purpose, an important component for the success of selective collection activity is the education of citizens and the coercive force of the authorities.
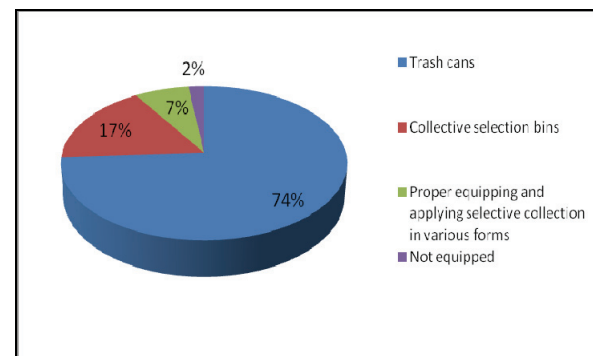

Fig. 5. Fitting selective disposal locations, in Romania (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

As mentioned above, a category of waste with high impact on the environment and its quality, associated with poor equipment locations to facilitate selective collection, is represented by packaging, in particular the non food packaging. This refers to those household products packaging for which the manufacturing company responds, meaning that operators selling household goods, non food, assume a number of obligations to collect a portion, at least, from the packaging they put on the market. Food packaging and those derived from beverages gather 20%, an important and high percentage compared to other countries of the European Union. The

packaging waste from food and beverage comes in part from social activities to which the individual participates during the day. From this perspective, and as a solution at the same time, the need of street bins arises, being handy to consumers. However, as shown in Fig. 6, this is another strategic point where Romania is deficient.
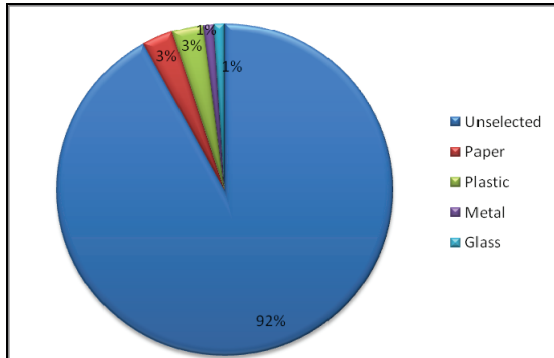
Fig. 6. Structure of Romania bins capacity as of 2010. (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

The structure of park bins in Romania in 2010 reveals that a ravishing high percentage (92%) is represented by non-selectively bins, i.e. bins where the waste is collected nonselectively, removing the opportunity of their revaluation or recycling. Each percentage of 3% of the park bins in Romania hold paper and plastic waste, but there is no certainty or guarantee that these wastes collected selectively are selectively treated, recovered or recycled.

It is important to emphasize that, due to such official statistics the activity of recycling companies presented on the domestic market recorded significant increases in recent years due to a strong demand from steel mills, on the segment of ferrous waste. On the other hand, due to higher prices of raw material and the fact that EU legislation requires rules of quantities of materials to be recycled per capita, there is the possibility that recycling of household appliances to become a good deal.

The recovery and recycling of waste, whatever their nature, represent one of the major activities for the global economy, taking into account the increasing appearance of diminishing natural resources of raw materials (CEPI, 2003; Ghermec et al., 2009; UNEP, 2005).

However, for certain types of waste, basically there is no viable option for recovery at national level (e.g. glass). The system is available primarily for PET packaging and paper. Recycled quantities come mainly from economic agents and in a smaller extent from the population, which receives money for material handed over to specialist units. Other parallel circuits for recycling are based on collection on the streets or in storage areas. They also represent a relatively important proportion, but difficult to quantify.

According to statistics, a mere 2% of all locations are lacking any equipment that may

stimulate selective disposal. A most important role in the selective disposal process is the ability of local authorities of identifying the source, as a first step towards deciding upon measures to me taken, aiming at diminishing amounts of waste originating from packaging.

The rate of waste generated by building and demolishing operations is decreasing which means that ventures are getting in line with the environmental laws. Nevertheless, for some types of debris, there is virtually no viable option for reuse, at the national level (glass, for instance). As mentioned before, the system is currently in place solely for PET and paper waste (Ilie, 2007). The small quantities that are being recycled originate mainly from companies and to a lesser extent from the population, the latter being offered money in exchange for materials handed over to recyclable material disposal points (Simion et al., 2013). Other parallel recycling routes are based on street or storage areas disposal. That holds a comparatively high preponderance, yet hardly quantifiable (Ackerman, 2000; Apitz, 2010; Baas and Huisingh, 2008).

Waste generation is the indicator that best illustrates the extent of the interaction between human activities and the environment. Waste generation follows usually the consumption and production trends (Curran and Williams, 2012). For example, the generation of waste (volume/capita) increases along with the increasing living standards. Increasing economic production, but also the inefficient management of resources, lead to the generation of large amounts of waste. In this context, Fig. 7 lists the comparative situation of waste collected in the period 2007-2010 in Romania.
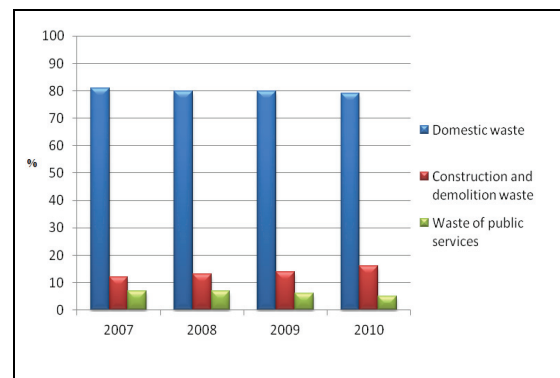
Fig. 7. The comparative situation of waste collected in Romania during 2007-2010 (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

Regarding electrical and household appliances waste, the selective disposal trend is obvious. A decisive role in stimulating selective disposal of waste is the fact that three quarters of disposal locations are fitted with bins, which represents a first step towards equipping selective disposal centers. An involution can be observed in the percentage of household wastes and those from construction and demolition. This involution can be attributed on the basis of a legislation adopted in this period.

Worryingly is the growing trend that displays waste arising from advertising services, tendency that implicitly leads to the idea that whoever should propose policies and solutions actually generates increasingly more waste.

As for the number and surface of industrial landfills existing in Romania, the following aspects are relevant:

- The data provided by various sources are relatively uneven and show a high variation from one year to another in the actual state of affairs nationwide. As it is highly unlikely that landfills are open or closed at such a high rate, the cause of the error seems to be the way of reporting facts and of collecting data.

- Ventures are not fully aware of the existing laws and in many cases they do not hold clear information regarding the landfills they manage (Jin et al., 2006; Korhonen et al., 2004).

- The lack of financial sources and the staffing shortage in local and central governments do not allow for checking from time to time the information provided by ventures, to enable having centralized data with the slightest chance of error.

Once analyzed the situation of waste so far based on the collection of data, we went to next step in our research, which is to prepare the forecast related to the evolution trends of the main categories of waste in Romania. Accordingly, we graphically analyzed the evolution or involution, as appropriate, of the amount of waste produced in the country. We added a trend line, which means that, taking into account the data from the last three years and starting from the premise that there will be the same conditions, we will be able to determine where the state will be situated over a period of time in terms of waste generation. Fig. 8 illustrates the involution tendency of plastic waste production. We can see that, around 2015, a decrease by nearly 25 percent in the amount of plastic waste production could be expected in Romania. This fact is stimulated primarily by the selective placement of bins, at least for PET, but also due to increasing the education degree, development of public space, preference of families for glass food packaging etc.
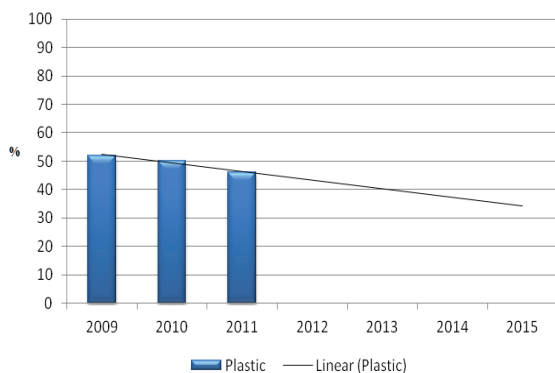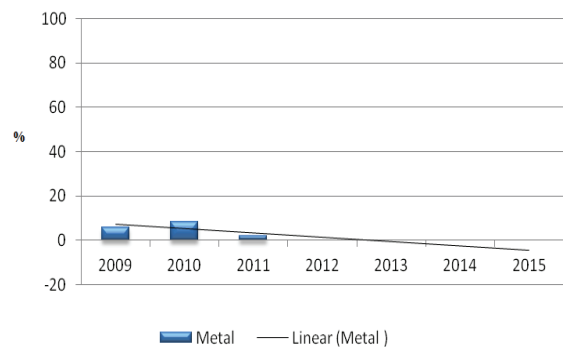

Fig. 8. Romanian trend of evolution in the amount of plastic waste (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

In Fig. 9, a tendency of sudden increase in the production of waste paper can be notified. This fact is due to a lack of implementation of environmental systems in private firms and state economic agencies, of excessive bureaucracy in some institutions etc.
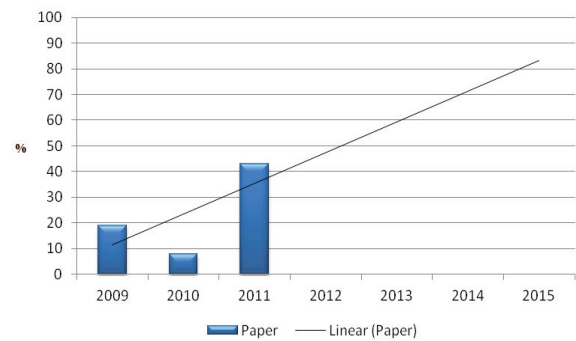
Fig. 9. Romania trend of evolution in the amount of paper waste (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

Waste paper represents an important chapter which needs to be reconsidered by the designated bodies, the more as the paper shows a higher degree of recycling. In contrast to the situation of waste paper, the graph shown in Fig. 10 indicates an involution of quantities of scrap metal waste. Moreover, in similar conditions as in the interval 2009-2011, it is possible that in the next future scrap metal to be no longer an environmental issue. The steadily falling in the amount of waste is due to the fact that the industry is no longer a productive sector in Romania and those firms that still operate on this profile have legal and standardized obligations to recover scrap metal.
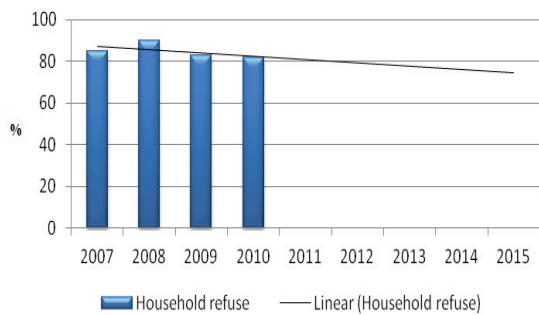

Fig. 10. Romania trend of evolution in the amount of metal waste (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

In terms of waste glass, the amount of waste glass is expected to be twice than that determined in 2011 up to the year 2015, as shown in our analysis and forecast illustrated by Fig. 11.

This can have many causes, starting from the preference of customers to buy food in glass packaging and to the fact that in most cases glass packaging is not returnable. The quantities of household waste have a slight tendency to decrease, reaching in 2015 to decline by about 10 percent, as can be seen in Fig. 12.
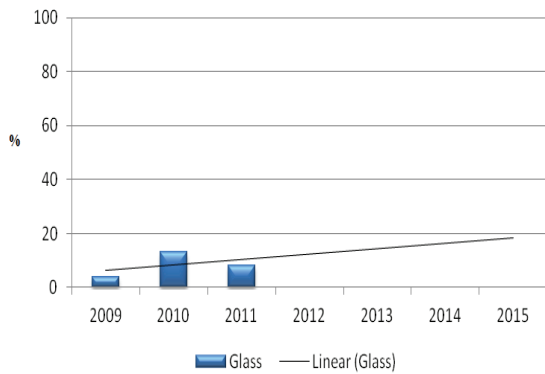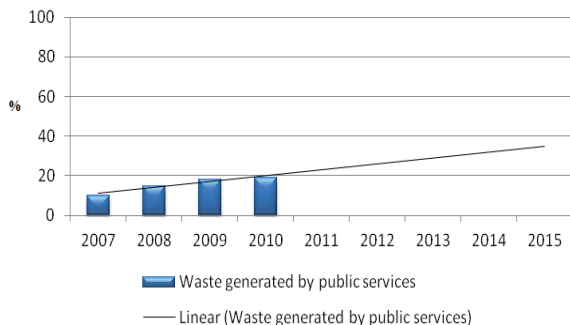
Fig. 11. The Romania trend of evolution in the amount of glass waste (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

Fig. 12. The Romania trend of evolution in the amount of household refuse (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

The decreasing tendency could be related to changing food habits of the Romanians, meaning that new preferences move towards the food precooked, and the fact that in large cities there are separate collection centres or campaigns showing the importance of selective collecting.

Another category of waste for which we have analyzed the tendency is that category resulting from public services (Fig. 13). From a small percentage, less than 10% in 2007, the amount of waste involved in this type will come to double until 2015.

Fig. 13. The evolution in Romania of the amount of waste generated by public services (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

Not ultimately, an analysis was conducted on waste arising from construction and demolition. Fig. 14 illustrates that the trend of this category of waste is

falling out. This is definitely due to the legislation on the implementation and enforcement of legislation.
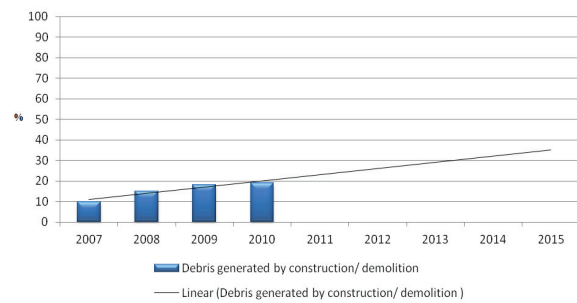
Fig. 14. Romania trend of evolution in the amount of debris generated by construction/ demolition activities (adapted upon www.anrsc.ro, www.anpm.ro, www.statistici.insse.ro)

According to some studies (Iacoboaea et al., 2009; Iacoboaea and Sercaianu, 2009), large differences in construction and demolition waste generated in EU countries can be explained by the variation among the technologies used, the building traditions in terms of construction and materials used, the geological and seismic land, and especially economic activity in the construction sector. Currently, most of the amount of construction and demolition waste generated in the European Union is stored together with other categories of waste. Waste storage do not only occupy large areas of valuable land, but also causes air, water and soil pollution, by occurrence of carbon dioxide (CO_2) and methane (CH_4) gases that contribute to the greenhouse effect.

In Romania, construction and demolition waste is stored in existing warehouses, or is left by the wayside, affecting the landscape and polluting the environment. Non-compliant deposits do not comply with rules of location, waste composition, leachate and landfill gas collection systems, generating hazards to human health, environment.

To be able to recycle, Romania needs specific laws in construction/demolition waste. Furthermore, techniques and technologies are necessary to reintroduce materials in the productive cycle (as secondary raw matter), a market demand for recycled materials and the wide-scale participation of consumers and producers (Lavagnolo, 2013; Melosi, 2005; Merced, 2008).

Construction and demolition waste must be collected separately in order to be later transported to recovery stations and specialized treatment. To reduce the amount of waste deposited according to the European legislation (EC Directive, 1975; EC Directive, 1975) there should be forbidden to store construction and demolition waste that can be recovered (reused, recycled, recovered energy). The European strategy for waste recycling puts a particular focus on prevention, reuse and recycling, regardless the nature of activity from where they come from, and Romania has implemented the legislation associated to this strategy (GD 739, 2003; GD 856, 2002).

4. Key aspects of green marketing strategy on waste management and policy in Romania

Having as a starting point an analysis related to the waste situation in Romania, we proposed in our scientific approach a SWOT analysis, which could reveal key aspects of green marketing strategy on waste, highlighting in essence strengths, weak points, opportunities and threats (Table 1). It is important to note that, in order to achieve this SWOT analysis, we considered a very wide range of issues, from official statistics at European or national level, legislation, environmental projects in progress to potential projects developed with European funding, and numerous reports carried out by resort institutions.

Table 1. SWOT type analysis about the situation of waste in Romania

Strengths	Weaknesses
- The fact that it can be quantified the proportion of the amount of waste with environmental impact - PET bottles, bags and aluminium cans can be considered as materials that can be replaced with other, organic or at least recyclable - The existence in major cities in Romania, at least in major cities, of points of collection by purchasing from inhabitants the Beverage Bottles for recycling purposes - The existence of programs to collect plastic waste from nature - Waste paper is an easily recycled waste from a technical point of view compared to other types of waste - Waste paper as waste from households is easy to be collected selectively, with no need for special conditions, as with glass or chemical waste, this being neither very bulky, as Bottles - There is a decrease in the amount of waste metal, peaking up to 0 in a reasonable period of time - In 2011 the amount of glass waste fell almost by half compared to the centralized quantities for 2010 - The amount of household waste has a declining trend since 2007 toward the present - The possibility of accessing European funds for the development programs through which the amount of waste can be reduced (starting from researching in detail the problem and to purchase equipment) - The possibility of involvement of local authorities in public waste management, by the authority with which they were invested and legislative levers they have at their disposal, to impose measures to control the amount of waste in public services - The tendency in terms of waste from construction and demolition is clearly a decreasing one - The economic agents, especially, understood the importance of proper management, based on a coherent policy for this type of waste	- Plastic waste is more present in rural areas than in urban areas which could lead to pollution en masse starting from soil, air, water and clogging up small waters - Paper is recycled in a very small extent, both in urban and in rural areas - The absence of stimulating campaigns of the port of textile bags or recyclable paper bags use - Lack of incentive policies for selective collection of plastic waste - Overloading bins for collecting plastic bottles, this leading implicitly to mixing plastic waste with the household waste several times, at least in populated areas of large cities - Excessive consumption of food or beverages packaged in plastic - In urban areas the consumption of cigarettes is higher than in rural areas - The quantity of paper waste is increasing on the time interval until 2015 - Not all economic agents have implemented a certified quality system for environment or an integrated system in order to assume responsibilities in relation to the recovery of paper waste that are present on the market - The abolition of collection points for paper waste surcharge for recycling purposes - The metal waste not collected selectively is difficult to recycle - - Metal selective waste collection is not done necessarily following a program and a well-established policy, this collection is catalogued as a basic occupation, almost a job, to national representatives of a particular ethnic group
Opportunities	**Threats**
- The possibility to implement appropriate environmental awareness campaigns that are about to be conducted - Once selectively collected, waste can be harnessed more easily and effectively -- Planting spaces of selective waste collection - Replacing PET with returnable bottles used for drinks - Replacing plastic bags with reusable textile bags or biodegradable bags - Pecuniary valorisation of waste consisting of PET and aluminium cans - The situation of knowing the percentages of different types of waste on a minimum of years can lead to the implementation of policies and programs tailored specifically to the needs and opportunities provided by figures - Financial stimulation or other kind of households for selective collection of waste gathered in a household - Reestablishment of collection centres for recycling (paper, glass, metal) in order to pecuniary capitalize waste - Development of processing technologies and plastic recycling from Bottles - Conducting training and specialized games for children from certain neighbourhoods where they register the greatest quantity of waste, depending on the locality (children are more	- Amounts in which there is selectively collected waste are relatively small compared to what is produced - The abolition of centres that collect waste paper and glass for recycling purposes - Lack of interest of the authorities towards the problem of selective collection - The non initiative of major retailers to change plastic bags with textile and / or paper ones - The high costs involved in replacing glass bottles plastic bottles - Elimination of centres taking bottles for recycling purposes - Intensively consumed beverages marketed in plastic packaging - The use in public spaces like malls, pizzerias, etc of plastic dishes - Lack of information campaigns about the period of disintegration of plastic materials and harmful effects that plastic has on food and beverages contained - The absence of awareness and information programs on selective collection - Lack of environmental education in Romania - The absence of legal instruments that allow coercive force of the state to intervene in purpose of selective waste collection

responsive and easier to unlearn habits) - Collaboration between local and national authorities with cum on reducing the amount of waste from public services - The possibility to access European funds Legislation in favour of an efficient management of such wastes	- It is very possible to have such a large amount of household waste because inside them there are collected other types of waste too - In large part, those who manage waste category from public service have responsibilities concerning waste in general and a deficient management of a waste category can affect the whole process of waste management.

Based on SWOT analysis we highlighted the following issues regarding the problem of municipal waste management in Romania: the involvement of local authorities in this activity is insignificant, made at the minimum limit prescribed by law. Beyond coercitive issues required by law, central and local authorities could involve in the community through European funds in order to develop educational programs about the selective collection, in the first phase.

Local authorities in Romania should put the foundations of a unified and national campaign to collect information regarding waste management, that would be helpful in waste management measures. We appreciate that a clear and public system of waste management, starting from forecasting to waste disposal would implicitly lead to material, social, economic gains. Although local authorities should be managers of the campaigns of waste management, they, in turn, are limited in powers compared to private operators. Moreover, because not all companies have implemented an environmental system according to ISO 14001, waste management is arbitrary, taking into consideration for this activity the economic component of profit.

In this context is the policy of awareness of the importance of selective collection in terms of municipal waste is very important. From our studies and observations, we consider that a big disadvantage that Romania has compared to other European countries is that there is no education in this respect in the public educational system, since the early education stage. The lack of formal environmental education in Romanian educational institutions is a sore spot with long-term effect.

In the SWOT analysis we proposed a series of measures that could be placed at different levels, from the population to the European authorities, as shown in Fig. 15.

Some measures fall within the competence of national and European authorities, as follows:

1. initiation of awareness and information programs regarding collective selection, especially submitted to state institutions and multinational bodies;

2. initiation of formal educational programs (in education institutions) such as classes of ecology;

3. improvement of the legislative framework, in line with the communitarian acquis;

4. design and development of tools and levers to stimulate selective waste collection, submitted to state institutions and multinational bodies.

Some measures which fall within the competence of population and commercial agencies are as follows:

1. quantification of the amount of waste generated by commercial agents in an appropriate legislative framework;

2. calling the coercive force of law for the purposes of public education for selective waste collection;

3. accessing EU funds in order to create conditions for the selective collection especially in rural areas;

4. promoting awareness campaigns by the retail firms with the purpose of using bags of textile material and / or recyclable material;

5. conducting campaigns for paper collection in education (kindergartens, schools, universities).

Some measures fall within the competence of national and European authorities:

1. establishment of special spaces for selective collection in each district

2. development of public-private partnerships in order to collect at the level of public authority the scrap metal

3. involvement of local authorities in awareness campaigns to promote the selective collection of municipal waste

4. investment funds in awareness campaigns to educate the population in favour of selective collection.

Measures which fall within the competence of national and European authorities

Measures which fall within the competence of population and commercial agencies

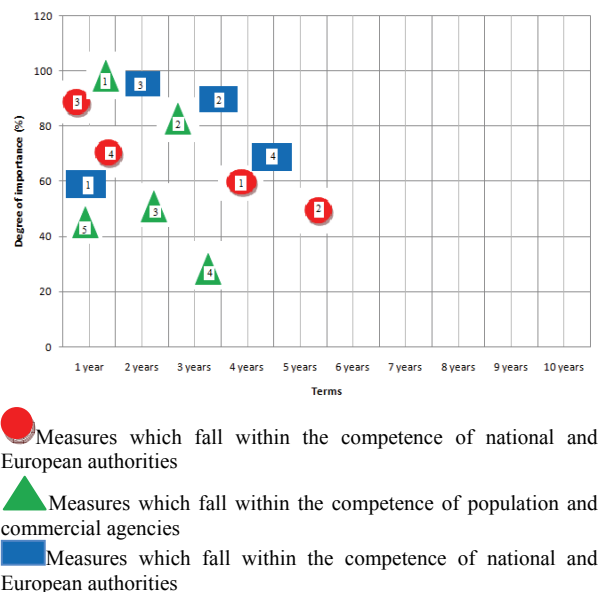Measures which fall within the competence of national and European authorities

Fig. 15. Proposed measures, depending on the importance and implementation period

4. Conclusions

The originality of this study arises from the fact that it is conducted based on official statistical data processed and presented as a trend of evolution in time. This paper is particularly scientifically relevant as it may be a starting point in implementing waste management programs by local governments, in achieving public health programs by national governments and, last but not least, in implementing environmental programs to an European scale.

We note that in the context of green marketing, this research proposes to achieve a balance between the present economy, on the one hand, and long-term interests of society, on the other hand. It aims to raise awareness of respect for the environment, since green marketing is targeting areas of environmental protection and ecological products and services. Very high rates of household refuse are produced, showing the lack of awareness of the population about the importance of waste selection and minimal recycling and reuse of recyclable materials.

Beyond numbers and statistics, the national policy on waste management subscribes to European policy goals of waste prevention and aims to reduce resource consumption and practical application of the waste hierarchy, but these principles are not completely respected. So, it is that today, at EU level the municipal waste is treated by storage (49%), burning (18%), recycling and composting (33%), while in Romania the main method of waste disposal is still represented by storage, according to official data.

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