THE IMPACT OF SOLID WASTES AGAINST THE PRINCIPAL ENVIRONMENT COMPONENTS

IMPACTUL DEŞEURILOR SOLIDE ASUPRA PRINCIPALELOR COMPONENTE DE MEDIU

ŞUTEU Daniela[1], ZAHARIA Carmen[1], BĂDEANU Marinela[2]
[1]"Gh. Asachi" Technical University of Iasi, Romania
[2]University of Agricultural Sciences and Veterinary Medicine Iasi, Romania

Abstract. *Together with the introduction of sustainable development concept, the problems of wastes are clearly emphasized, because it can not be applied a sustainable development, in economic, social and environment protection terms, without implementation of a sustainable wastes management. When is speaking of sustainable wastes management it must be considered the following: reduction of wastes quantity, waste use as secondary raw matter, non-recovering wastes deposition into controlled landfills, wastes use as alternative fuels.*
Key words: solid wastes, environment impact, waste management

Rezumat. *Odata cu introducerea conceptului de dezvoltare durabilă, problematica deşeurilor iese şi mai mult în evidenţă, deoarece nu se poate realiza o dezvoltare durabilă, in termeni economici, sociali şi ai protecţiei mediului, fără a implementa şi gestionarea durabilă a deşeurilor. Vorbind despre gestionarea durabilă a deşeurilor ne referim la: reducerea cantităţilor de deşeuri, utilizarea deşeurilor ca materie primă secundară, îngroparea deşeurilor nerecuperabile în depozite controlate fără a influenţa mediul, utilizarea deşeurilor ca şi combustibil alternativ.*
Cuvinte cheie: deseuri solide,impactul asupra mediului, managementul deseurilor

INTRODUCTION

The 21st century society is a super industrialized one, the lifestyle and civilization level being highly superior to the one in the last century, with an urban explosion difficult to control, and with a consumption rate increasing every year. But, as a paradox, the same society faces a serious crisis of raw materials, the resources exhaustion and the acceleration of the environmental contamination (Zaharia C. and all, 2008). Presently proof is given about the fact that the industrial civilization generated disequilibrium which is difficult to control, as a consequence of the irrational exploitation of natural resources, and facing at the same time an enormous amount of industrial and urban waste. The waste problem, irrespective of the category, but mainly the biohazard and toxic one, is of an increasing interest both in the intensely industrialized countries and in the countries on the way of development. as a proof of it we have numberless norms and juridical deeds elaborated both at the European Union level and internationally; all of them aim at regulating the present tendencies of environmental contamination as a result of the uncontrolled waste storage places, irrational exploitation of several categories of resources, deforesting, emissions and spillage with negative impact on the atmosphere, on the soil and on the hydrographic basins.

Analyzed under all the aspects, we can say that waste represent a substantial loss of resources, both material and energetic. It is the consequence of the fact that the excessive waste generation is the result of inefficient production processes, low durability of the goods and a certain consumption profile. The waste volume is the indicator of the way a society uses the raw material efficiently or inefficiently (Oros V. and all, 2002; Ungureanu C.and all, 2006). Once the concept of durable development was introduced, the waste problem is much more visible, because we cannot talk about a durable development in economic, social and environmental protection terms without the durable waste management implementation. When we speak about durable waste management we refer to: reducing the waste quantity, using waste as secondary raw material, burying the unrecoverable waste in controlled storage places without harming the environment, using waste as alternative fuel.

MATERIAL AND METHOD

This paper proposed a preliminary study by synthesing the scientific literature data in order to initiate the experimental researches on the integrated management of solid wastes, and biodegradable wastes respectively.

In this context, we used the informations from scientific literature, environmental reports and case studies from Romania and from abroad.

RESULTS AND DISCUSSIONS

1. LEGAL FRAMEWORK REGARDING THE WASTE MANAGEMENT

The achievement of the targets established in the European Union regarding the waste management is supported by a solid institutional and legislative framework, and by regulation. In this context we may mention the following UE Directives regarding the waste management (Zaharia C., 2008): Directive referring to batteries and accumulators containing dangerous substances (66/2006/EEC); Directive regarding the waste regime; Directive 293/2005/EC referring to the rules of monitoring the reuse/exploitation and reuse/recycle targets for the disabled cars; Directive 12/2004/EC referring to packing and packing waste; Regulation 2150/2002/CE regarding the statistics in the waste field; Directive regarding hazard waste (95/2002/EEC); Directive 96/2002/CE and Directive 95/2002/EC regarding electric equipment and electronic waste; Directive 76/2000/EC and 67/1994/EC regarding waste incineration; Directive 31/1999/EC regarding the controlled waste storage; Directive regarding the disposal of the petroleum waste (75/430/EEC), (87/101/EEC) and (91/692/EEC), etc. These directives are the result of the debates in the International Conventions (Basel Convention regarding the international transport of hazard waste and its disposal; Stockholm Convention regarding the persistent organic pollutants - 2004), and the organisms habilitated by the European Union are in charge with the compliance and accomplishment of the provisions of these norms. The European Directives were transposed in the national legislation as laws (i.e. Law no.27/2007 on the waste regime; Law 265/2002 on the international transport of the hazard waste; Law 139/2002 on the public services for city sanity; Law 465/2001 on the management of the industrial recyclable waste), government resolutions and ordinances (i.e. HG 788/2007 on

measures regarding the waste transfer; HG 358/2007 referring to the approval of the national Strategy of waste management and of the national plan for waste management; HG 236/2007 on the management of the used oil; HG 61/2006 on waste management; HG 1872/2006 on packing waste management; HG 1313/2006 on the management of the disabled cars; HG 621/2005 on packing and packing waste management; HG 448/2005 on the management of electric and electronic waste; HG 349/2005 regarding the waste storage; HG 268/2005 regarding the waste incineration; etc.) (Zaharia C., 2008). The Directives of the Communitary Strategy referring to Waste Management COM (96) 399 several principles were established which are defining and relevant for what is desired, a planning process for waste management. These principles refer to:

- Minimization of waste generation for the conservation of the environment and of the natural resources;
- Reducing the impact generated by waste on the human health and on the quality of the environment, especially by reducing the dangerous substances in waste, and implementing the principle of precaution;
- Make sure the waste generators pay for polluting the environment, by activating the principle "the Polluter pays";
- Assure the necessary infrastructure by establishing an efficient facilities' network for the waste disposal, based on the principle of proximity.

2. TYPES OF SOLID WASTE

Starting from several definitions of the "waste", their classification tried to be done, using criteria which allow the subsequent achievement of statistics, comparable and compatible in the UE countries. Therefore the UE Council elaborates the Directive 75/442/CEE subsequently amended by Directive 91/156/CEE which classifies the waste according to the source. A waste classification can be done according to the following criteria (Oros C. and all, 2002; Ungureanu C. and all, 2006; Atudorei A., 2002):

1. According to **major sources**, in the order of the contribution, we have:
   a. agricultural waste
   b. mine and quarry waste
   c. manufacture (industrial waste)
   d. city waste
   e. waste from energy generation.

2. According to the **chemical composition,** waste divides into:
   a. organic waste (vegetal and animal waste, paper, cardboard, textile, plastic, wood, balsa, pieces remained from skin and fur cleaning, organic mud);
   b. inorganic waste (metal and non-metal, glass, ceramic, clinker, ashes, inorganic mud, construction material – cement, plastering) ;

3. According to the **characteristics of the main elements**, we have:
   a. combustible waste (paper, rubber, textile, plastic, wood)
   b. fermentable waste (rests of food, fruit and vegetables)
   c. inert waste (glass, metal, ceramics)
   d. fine waste (soil, clinker, ashes)

4. According to the **aggressiveness towards the environment**:

a. hazard waste (explosives, oxidant, inflammable, irritant, toxic, cancer, corrosive, infective, etc.)
b. inert waste

The organic (biodegradable) represent an important part of the city waste, approximately 40-70%. There are then important quantities of waste from the agriculture and zootechnics, from agro-industrial processes, as well as the mud from the water treatment stations. Starting from their capacity of fermentation, in the view of the implementation of efficient techniques in order to treat this type of waste, several biotechnologies were developed and improved; in many cases they operate simultaneously with or they replace the incineration and controlled storage techniques. Their big advantage is that they reduce the waste volume, creating instead two highly useful products: compost and biogas. Among the biotechnologies used for the waste exploitation and treatment, the digestion technologies (aerobic – composting and anaerobic). These ones, through their main generated products, meets the new UE tendencies regarding the obtainment of energy from new sources and the replacement of the chemical products for the enhancing of the soil fertilization with ecological product, without a negative impact on flora and fauna.

3. THE IMPACT OF SOLID WASTE ON THE ENVIRONMENTAL FACTORS

Along with the concept of durable development, the issues of the waste stands out more, as a durable development cannot be achieved in economic, social and environmental protection terms, without also implementing the durable management of waste (Zaharia and all, 2008). When speaking about the durable management of waste, we refer to: the reduction of the waste quantities, the use of waste as a secondary raw material, the burial of unrecoverable waste in controlled warehouses without influencing the environment, the use of waste as an alternative fuel. On this background, the efficient management of waste calls for the existence and observance of special measures, appropriate to each phase of exploitation and disposal of waste. In addition, the responsibility of the manufacturers related to their own products when they become waste and the involvement of the population in the selective collection of waste should also be stressed. In the European Union, the waste management policy is based on the waste hierarchy principle, which implies mainly the prevention of the waste generation, followed by its recovery (reuse, recycling, recovery of energy or materials) and eventually its elimination (incineration without recovery of energy and storage) (fig.1).

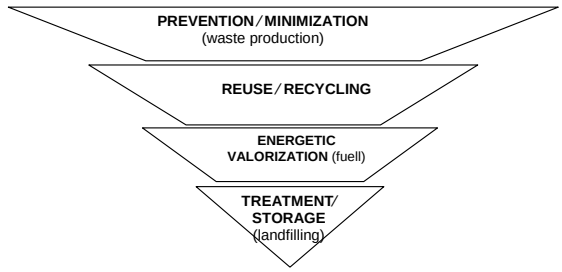

Fig. 1. Priorities in the approach of the waste management

Due to the lack of appropriate set up and inadequate exploitation, uncontrolled waste warehouses – the most common practice nowadays in numerous countries for the waste management – are among the sources recognized as generating negative impact for the environment and public health. Among the impact and risk forms determined by these warehouses, either industrial or municipal, we mention the following: landscape changes and visual discomfort, air, surface and underground pollution, changes of the soil fertility and of the biocenoses on the neighboring lands.

4. WASTE TREATMENT AND EXPLOITATION ORIENTATIONS

The basic principles of the environmental policy in Romania are established according to the European and international provisions, with a view to ensuring nature protection and preservation, biological diversity and durable use of its components (NPWM). The main **principles** based on which the waste management activities are emphasized in the National Plan for Waste Management (NPWM) are the following:

1. The principle **of protection of the primary resources** is formulated in the wider context of the "durable development" concept and establishes the need to minimize and optimize the use of primary resources, especially the renewable ones, emphasizing the use of secondary raw materials.
2. The principle of **preliminary measures**, correlated to the principle of the **BATNEEC use** ("The best techniques available that do not involve excessive costs") establishes that, for any activity (including for the waste management), the following main aspects must be taken into consideration: the current stage of the technology development, the requirements for environmental protection, the selection and application of those measures feasible from the economic standpoint.
3. The principle of **prevention** establishes the hierarchy of the waste management activities, in decreasing order of the importance they should have: avoiding the appearance, minimalization of amounts, treatment with the purpose of recovery, environment-friendly treatment and disposal.
4. The principle stating that the **pollutant pays**, correlated with the principle of the **manufacturer's responsibilities** and that of the **user's responsibilities**, establishes the need for the creation of an appropriate legal and economic background, so that costs for the waste management be covered by the waste generator.
5. The principle of the **substitution** establishes the need to replace hazardous raw materials with non-hazardous raw materials, thus avoiding hazardous waste.
6. The principle of **proximity**, correlated to the principle of **autonomy** establishes that waste must be treated and eliminated on the national territory, as much as possible, and as close as possible to the generation source; in addition, the export of hazardous waste is accepted only by those countries that have appropriate elimination technologies and only in compliance with the requirements regarding the international waste trade.
7. The principle of **subsidiarity** (correlated to the principle of proximity and to the one of autonomy) establishes the granting of competences so that decisions in the field of waste management may be taken at the lowest administrative level related to the generation source, but based on uniform criteria at a regional and national level.

8. The principle of **integration** establishes that the waste management activities are a part of the social-economic activities that generate them.

In compliance with the above mentioned principles, a hierarchy of the waste management options may be made, depending on the priorities (Fig.1) (SNGD).

CONCLUSIONS

The waste treatment and exploitation become imperative in the new century, in the context of the exhaustion of the raw material resources and the enhancement of pollution of all the environmental factors.

Moreover, the practical application of waste treatment technologies that may lead to products useful to the society, considered raw materials for a series of industrial sectors or alternative sources of energy and amendment for the soil tends to replace the controlled permanent storage and incineration.

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