THE IMPACT OF URBAN AND INDUSTRIAL WASTE STORAGES UPON THE ENVIRONMENT

IMPACTUL DEPOZITELOR DE DEŞEURI INDUSTRIALE ŞI URBANE ASUPRA MEDIULUI

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Abstract: *The purpose of this paper is to study the impact of urban and industrial waste storages on the environment. We have observed the following issues: waste production, the surfaces it occupies, the effect of waste on the environment, the problems Romania is facing today, the concept of integrated waste management and the objectives of integrated waste management*

Rezumat: *Scopul acestei lucrări este de a studia impactul depozitelor de deșeuri industriale și urbane asupra mediului înconjurător. S-a studiat producerea deșeurilor, suprafețele ocupate de acestea, efectele depozitelor de deșeuri asupra mediului, problemele cu care se ocupă România în ziua de astăzi, conceptul de management integrat al deșeurilor și obiectivele managementului integrat al deșeurilor.*

Key words: *waste, storages, waste management, inert materials, permeable storages*
Cuvinte cheie: *deșeuri, depozite, gestiunea deșeurilor, materiale inerte,depozite neimpermeabile*

INTRODUCTION

Generally, as a result of the lack of facilitation and deficient exploitation, waste storages are considered to generate environmental and public health impact and risk.

Air pollution with unpleasant odours and suspensions brought forth by wind is especially obvious in urban storages, where they do not apply cell exploitation and inert material coverage.

Discharges off storage slopes near surface waters pollute these waters with organic substances and suspensions.

Permeable urban waste storages are often the source of infesting underground waters with nitrates and nitrites, and other pollutes elements. Carbon leakages from storages, as well as discharges off slopes, influence the quality of surrounding soils, a fact that is reflected in a negative way on their usage.

Removing waste storage soils from the natural or economic circuit represents a process which can be seen as temporary, but, in the concept of "sustainable development", it lasts at least for two generations, counting the equipping period (1-3 years), exploitation (15-30 years), ecological revival and post-monitoring (15-20 years).

MATERIAL AND METHODS

We can synthesise Romania's problems in waste management as follows:

- Waste storage in open-air areas is the most efficient way of destroying them permanently;
- Current storages are sometimes located in vulnerable places (near housings, surface or underground waters, leisure areas);
- Waste storages are not properly equipped for environmental protection, thus leading to water and soil pollution in the respective areas;

- Current waste storages, especially urban ones, are not operated properly: they are not compacted and not periodically covered in inert material for fire and unpleasant odour dispersal prevention; there is no strict storage waste quality and quantity control; there are no facilities for biogas control; bad main and secondary roads for waste transport, the means of waste transportation are not cleaned when they leave the storage area; many storage areas are not enclosed, there is no proper entrance and there are no warning billboards.
- Soils in waste storage areas are considered spoiled soils, which can no longer be used for agricultural purposes; at the time being, in Romania there are over 12000 ha of soils affected by urban or industrial waste storage;
- Urban waste collection from the population is done in an unselective fashion; they are delivered at the storage sites mixed up, thus a great deal of their utilization potential is lost. (paper, glass, metals, plastic);

The above presented facts lead to the conclusion that waste management needs specific measures, proper to each waste destroying phase. Following these rules should represent the main objective of the affected environmental factors monitoring activity.

Of the total urban waste, approximately 40% represent recyclable materials, of which about 20% can actually be recycled, since that percentage is not contaminated. As a result of the selective collection under the framework of a pilot project, only 2% of the total recyclable materials generated are turned to account. The rest is destroyed through storage, thus losing a lot of secondary raw materials and energy resources. In the last years, private economic agents have initiated sustained cardboard and PET collection activities. In some towns, there have been set up collecting centres where the population can bring paper, cardboard, glass, plastic. In Romania, there are authorized institutions active in paper, cardboard, glass and plastic industry, which have started taking over waste from collecting centres and recycling or turning them into account. In some cities, there are pilot compost stations. In 2007, the total waste quantity generated by Romania was 281,200 thousand tones, 99.85% of which represent not harmless waste. The dangerous waste, according to the waste categories foreseen in the European Waste List, represent about 0.15% of the total waste quantity (table 1).

Table 1.

Harmless mining industry waste, 2007

	Harmful waste		Harmless		Total	
	– tones –	– **%** –	– tones –	– **%** –	– tones –	– **%** –
Mining industry waste	11,242	0.01	215,054,428	99.99	215,065,670	100.00
Other industrial activity waste	407,837	0.71	56,831,280	99.29	57,239,117	100.00
Urban waste	-	-	8,895,190	100.00	8,895,190	100.00
Total	**419,079**	**0.15**	**280,780,898**	**99.85**	**281,199,977**	**100.00**

The mining industry generates the largest percent of harmless industrial waste, over 76% of the total waste quantity, where mining activities and coal production represent more than 96% (table 2).

Waste, especially industrial waste, are health risk sources for because of their toxic substance content, such as heavy metals (lead, cadmium), pesticides, solvent substances, used up oil.

The most difficult problem is that of harmful materials (including toxic mud, oil industry products, dyeing factory residuals, metallurgic slag) stored alongside with solid urban waste. This situation can generate the appearance of inflammable mixtures and combinations, explosive or corrosive; on the other hand, the presence of biodegradable household residuals can facilitate the decomposing of complex harmful substances and reduce environmental pollution.

Table 2

Waste generated by the main categories, in 2007

Economic activity	Quantity – tones –	– % –
Machining industry	18,860,392	33.19
Producing and supplying of electricity, thermo-energy, gas and water	36,465,588	64.16
Water capture, treating and distribution	10,961	0.02
Recovering recyclable waste and material residual; Wholesale commerce of waste and residuals	176,494	0.31
Other activities	1,317,845	2.32
Total	**56,831,280**	**100.00**

Another activity that generates large quantities of harmless waste is the producing, transportation and supplying of electricity, thermo-energy, gas and water, with a 13.41% share (table 3).

Table 3

Harmless waste generated by main economic activities (others than mining), 2007

Economic activity	Quantity – tones –	**– % –**
Machining industry	18,860,392	33.19
Producing and supplying of electricity, thermo-energy, gas and water	36,465,588	64.16
Water capture, treating and distribution	10,961	0.02
Recovering recyclable waste and material residual;	176,494	0.31
Other activities	1,317,845	2.32
Total	**56,831,280**	**100.00**

RESULTS AND DISCUSSION

In order to achieve the competence in the new task field and in order to deal efficiently with the waste problem, we need a waste management plan with a global solution. The plan should not only comprise individual steps and techniques, but also an integrated waste management, as well as other alternatives regarding the combination of waste production limitation and waste disposal strategies. Also, turning waste to account should be a goal.

The main objectives to treat and store waste according to certain ecologic techniques

The required measures and methods, the individual steps, as well as their chronological order are being established and clearly brought forth in an integrated waste management concept.

The need of a waste management concept derives, on the one hand, directly from legislative data. In accordance with article 7 of the EU directive on waste, the responsible authorities should elaborate waste management plans. The plans should include the type, quantities and origin of the recycled waste, technical instructions, as well the surface of sanitation installations.

In the European Law, in art. 14 of the EU directive referring to packaging and the waste inside the packaging, it is stated that member state waste management plans should comprise, aside from packaging, the management of waste resulting from packaging.

The fundament for waste management plans on national, as well as regional, level, is supplied bye waste management concepts elaborated by the cities or town responsible for waste management.

The need for waste management concepts also results from the increased demands; this fact leads more and more complex waste management issues which requires differentiated solutions. A serious of individual measures must be applied, which help achieving an objective, an organization and a global coordination..

The following present the most import guiding lines:

- implementation of precise sanitation problems (selective collecting of old materials to be turned o account, separate collecting and ecological disposal of harmful waste);
- coordination and ordination sanitation measures (choosing a proper legal form for the functioning of waste management, sanitation within the corresponding community, supporting and coordinating sale measures and safekeeping of the recyclable material element);
- control of sanitation service provision (elaborating balances on quantities and materials, as well as examining basic costs in order to sustain, change or improve the waste management objectives);
- informing and counselling producers regarding the decrease of produced waste quantities, as well as encouraging recycling measures;
- elaborating and transmitting of some local provisions (local council decisions, norms and regulations) considered the most important legal basis for achieving waste disposal implying the possibility of influencing people's behaviours in the sense of reducing waste quantities (regulation of waste sanitation, the obligation of owning recipients for residues and using the sanitation, collecting, transport, tax system etc.) as well as creating a consciousness for safer and more ecological sanitation.

In regions, waste sanitation has to be established in accordance with the cities and towns in the area. More and more widely applied regional solutions regarding waste management will be necessary. This does not necessarily imply elaborated technical equipment. Here, we can think of coordination of multiple cities and/or villages, regarding the development of regional strategies.

Widely applied solutions do not exclude measures applied only on city or town level. The latter can represent an advantage, especially in preventing the creation and separate collecting of recyclable waste, where the active collaboration of citizens is necessary. Under the framework of a global concept, there must be widely applied measures as well as narrowly applied ones.

Also, within the global concept, we must take into account and integrate not just structures, but recycling measures as well, either communal or private.

The concept of integrated waste management can be helpful when authorising waste treating and disposal installations. This is to prove the understanding of waste management priorities, preventing their formation before recycling and ecological disposal, and in order to show the necessity of the respective installation.

We would like to add here that it will be hard to implement a waste sanitation installation, especially when it comes to storage platforms, and incinerators, since the people's ecological consciousness is still in the process of taking shape.

The necessity of a residual storage platform must be brought forth with the help of a global concept, along with the afferent production limitation and recycling measures in a respectable fashion.

The waste management concepts must supply us with an overall look upon the waste in a certain region (for instance at national or regional level. It has to indicate perspectives and necessary documents. Thus, it plays the role of a guiding line for the activities within the waste management field.

A concept integrated waste management comprises smaller concepts, which address different fields.

The general objectives are as follows:

- exhausting all waste preventing and reducing possibilities, cooperating with the population in the economic centre;
- sorting, collecting and recycling waste, which have to be brought forth the grey area of ecologic and economic points of view;
- decreasing pressure on storage platforms by using the traditional form of recycling, composting, and by pre-treating the "to be storage"; from both points of view economic and ecology
- the optimal use of energy, the just elimination, from a technical point of view of harmful waste.;
- examining all types of residuals to be disposed of, all other types, as for instance household waste, in order to recycle what can be recycled;
- establishing the waste management on a local market in the sense of territorial systematization and organization, as well as the idea of complying with regional and over-regional;
- maximum sanitation safety by creating a regional and over-regional system of supra-regional associations, from an ecological and economic point of view;
- for the recycling of residuals, composting, and for energetic recycling, for controlled storage and energetic testing, for controlled storage.

CONCLUSIONS

The impact and risk forms determined by urban and industrial storages are perceived by the population as follows:

- changes in the scenery and visual unease;

- air pollution;
- surface and underground water pollution;
- changes in soil fertility and composition of the adjoining biocoenosis.

What is more, ,biocoenosis are not in the none, changes:

- Vegetables become dominant over leading forces. ;
- Some mammals, birds, insects leave the area, much to the advantage of those who find their food (rats, crows).

Although, the effects upon the flora and fauna are theoretical temporary limited, the ecologic reconstruction will never be the achieved. The ecological reconstruction achieved after the liberation, will be able to re-establish ecologically, will not be able to restore the initial natural equilibrium, the evolution of the bio-system being modified irreversibly. The current practices of urban waste storage facilitate the multiplying and the spreading of dissemination area the dissemination of pathogen agents and their vectors.

A negative aspect is that many recyclable materials do not get recycled because they are stored alongside with non-recyclable materials. They get contaminated from a chemical point of view and can not be recovered.

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