

## SOLID WASTE DISPOSAL PROBLEMS IN ARIEȘ URBAN COMMUNITY FROM CLUJ COUNTY

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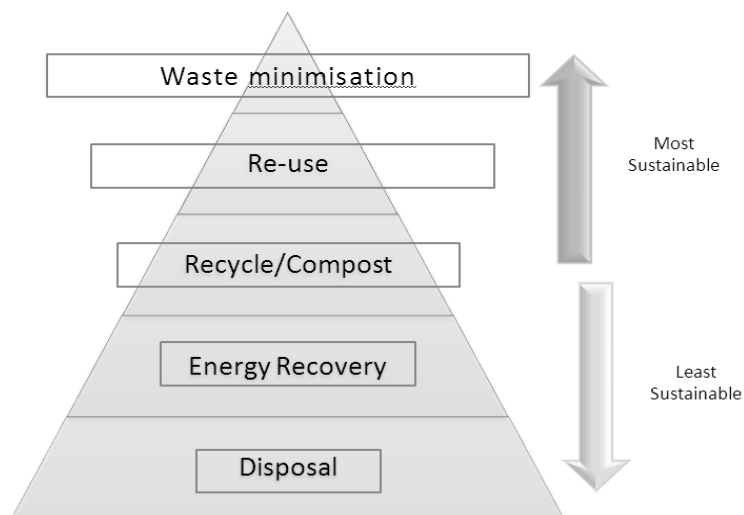
**Abstract:** In many technological societies, after the Industrial Revolution the problem of solid waste was appeared because of changing the consumption pattern of society. The part of solid waste which is related to the municipality is called municipal solid waste.

**Keywords:** solid waste, management, disposal.

### Introduction

Waste management has more and more become an important issue for the entire world, the waste humans are producing are now almost reaching a breaking-point for what the environment can take. This meaning that it is time to look for systems for an effective disposal of waste (Almorza et. al, 2002).

According to the EU strategy for waste management, the priority order for waste management options is as follow: reduction of waste, reusing of used material, recycling of used materials, recovering of energy from waste and the last option is land filling of waste.



**Figure 1. A Hierarchy of Waste Management**

*Source: after Forbes R McDougall et.al, 2003*

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These kinds of waste encompass packaging, food waste, bottles including PET & glass, cans, papers and agricultural wastes are the wastes which are unwanted and useless for all inhabitants during their life.

### **Solid waste disposal situation in Turda - Campia Turzii urban community**

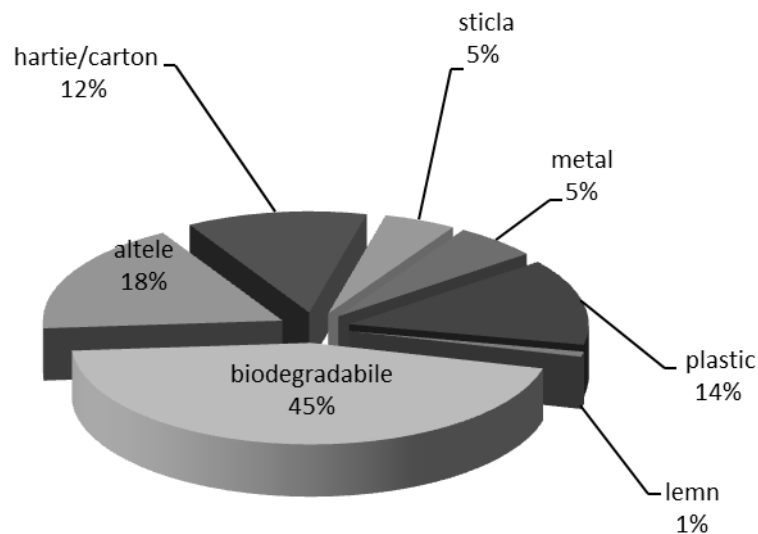
Turda and Campia Turzii cities are part of Arieș Urban Community, an association of local authorities from Arieș – Turda - Campia Turzii area, with vocation and duties of a public institution of inter-communal cooperation. It was created by act of free will expressed by the participating Councils in accordance with their legal powers, with the national and EU regulations. It is designated by the Council of Members to undertake for and on their behalf public services of common interest. The fundamental criterion of adherence and participation in Aries Urban Community is efficient access to common resources and rational integrated management of them with respect and protect the environment[6].

According to Government Decision no. 433/2004 approving the Regulation framework of organization and functioning of public sanitation services, they are part of public services for municipal and their primary objective is to protect human health and the environment from harmful effects of collection, transport, recovery and municipal landfill.

Sanitation of Turda municipality is realized by RADP Turda, a local public municipal service, organized, coordinated, regulated, conducted, monitored and controlled by local government.

Quality of data on the current situation is extremely important because these data are calculated based on forecast of estimated quantities of waste that will be generated for planning periods. Based on the amounts expected to be generated, is designed collection waste system and calculate new capacities for waste management facilities to be constructed.

Composition of waste in the city of Turda is shown in figure below biodegradables occupying a significant share in the total amount generated in the city.



**Figure 2. Composition of waste in Turda city (2009)**

*Source: Opportunity study on the delegation of management of sanitation services in Turda city*

Waste collection is done with containers, but the collection is mixed, the waste is transported to the inconsistent pit on the Key Street which will be closed by 2012. For ramp closing and execution of greening, the necessary funds amounting to approximately 1,414 million Euros.

In Campia Turzii city is being implemented "ECO Campia Turzii " Project financed by the Phare 2004 Economic and social cohesion "Investment scheme for small projects for waste management". Total investment is 719 898 Euros, the amount of 74,250.16 euros will be Campia Turzii City Council contribution[12].

By implementing the investment project "ECO Campia Turzii" was envisaged achieving a comprehensive, efficient, simple and sustainable community waste management for Campia Turzii area, involving major changes to current waste management practices. The target group is the city's population, socio-economic units, personnel involved in the operation of new waste management system, entrepreneurs (both existing and prospective).

Implementing the project aimed selective waste collection in the 25 specially designated collection points with concrete platforms, enclosed and fitted with euro containers, in which waste will be collected selectively by category:

- paper and cardboard (blue);
- glass, PET and metal (yellow);
- organic waste (Gray);
- textiles, wood, rubber, metal, ceramic (brown).

In this project, a garbage car and 18 m<sup>3</sup> compactors were purchased to provide transportation to the new waste sorting station. This is a metal building, located

on a concrete platform and is equipped with necessary equipment for processing recyclable waste. By arranging the transfer station between Campia Turzii and Turda, no recoverable waste will be transported from collection points directly to the existing storage bin. Also, there were purchased Euro-Dumpcarts and composting containers, which were distributed free to people in order to collect household waste.

In addition, the investment includes a campaign of information, awareness and empowerment of target group, which was achieved through a local media campaign, sending letters to all inhabitants of Campia Turzii, distribution of brochures, flyers, placement of posters, banners and organizing competitions in schools (on selective waste collection themes that describe the importance of selective waste collection and recycling).

Incompatible waste landfill site in Campia Turzii is inadequate (proximity to river and location in an area with urban potential) and is a major disturbing factor in urban development and attracting investment scenarios.

In the near future, in Arieș Urban Community will be promoted a new policy on waste to encourage a broader information, education and empowerment of citizens and in order to meet the milestones of integrated waste management hierarchy:

- reduce at source the quantity of generated waste;
- recovery of useful fractions of household waste;
- organic waste disposal.

In waste management, incineration solution is not a realistic solution for regional context Turda - Campia Turzii and surrounding villages because of high costs and operational investment. These costs have increased substantially (per tone of waste incinerated) because of tighter quality standards for gaseous emissions into the atmosphere. Lately, there is the strong current of opinion challenging economic balance, the overall physical and chemical process in conjunction with its high costs.

An appropriate waste management system minimizes risks to public health and has as a result a clean and healthy environment for everyone. The system must be financially supported by all social strata, and total costs must be recovered to ensure sustainability. A functioning waste management generates more income categories:

- income from charges for household waste from individuals;
- income from charges for household waste from operators;
- income from sale of recovered materials (paper/card, glass, plastics, metal, wood, organic waste etc.).

Supportability sanitation tariff is understood as the capacity of users of waste management services to pay for these services without sacrificing other basic needs. The main restriction which appears when this tariff is calculated, needed to ensure the sustainability of waste management system, is the possibility and capacity of population to pay for these services. Reality shows that the higher rates

are the percentage of bad payers is higher, because people can not afford to pay the bills given that there are other basic needs such as maintenance and food costs, which are priority. Prices should cover the entire cycle of sanitation - collection services, transport, sorting, processing and storage. One aspect that requires special attention should be households in financial difficulty which can not bear those costs in relation to their income. For them should be take some measures such as cross-subsidy, whereby operators indirectly finance population. In Arieș Urban Community is expected an increase of sanitation tariff of 2.2% for both population and businesses.

The investment made in Turda - Campia Turzii in 2002 aimed processing waste from these cities and neighboring towns in a large inter zonal ramps in order to avoid pollution in these areas. Cluj County Council has endowed the landfill with Power- Pack technologic line (second hand). Power-Pack technology is considered a way to store the waste on long periods, allowing tight packing by compaction and storage of large amounts of waste in small spaces. The concrete results of technology are bales of waste, organic feel, easily manipulated, transported and stored.

Total area of waste processing technology platform of interzonal ramp Campia Turzii - Turda is 8700 m<sup>2</sup>. It is considered that this method provides a good insulation against environmental waste in bales, maintain constant temperature conditions, protection of plastic cover against solar radiation. In addition, ballots are protected by meteoric water that infiltrates to the lower rows of ballots, which contributes to reducing the amount of leach ate which could occur if the plastic sheathing would deteriorate.

Currently, the platform is suspended since 2005 because of repeated failures occurring in the equipment used. It was found that the set of equipment purchased is not a device for sorting the waste before grinding, which is mixed. Resulting in a total of 10,000 bales stored vertically. We believe that ballots formed in this ramp are not in this set of biochemical and physical terms, this means that there are hazardous reactions occurring within their environment. Before forming bale, recoverable waste should be separated from the recoverable, mixing them is not an effective solution. The presence of organic waste in these bales causes fermentation processes even in the absence of air, with gas release. Moreover, Cluj Environmental Protection Agency (APM Cluj) said in a report that the soil near the Power-Pack platforms are heavily polluted. There were taken in Campia Turzii samples from the ramp area and was found an overshoot of normal indicators of Cd, Pb, Zn, Cu and Ni.

Municipal authorities have tried to find solutions for exploiting these ballots; a solution would be selling them to constructors of stadiums and highways, which would use these ballots for basic structures; another solution would be burning them. No alternative has been successful because compacted and wrapped waste was only partially selected.

## Summary

With non-selective collection of waste and maintaining compliant ramps, environmental impacts will continue year after year and environmental costs of rebalancing the affected areas will increase continuously. In this context, local governments have taken some steps to try solving local problems and even some counties in the country have benefited from substantial sources of funding and external technical assistance; the measures taken were not always fully implemented successfully.

These implementations demonstrate the difficulties faced by local authorities, based on two broad categories of institutional problems:

- no integrated approach to the whole cycle of waste and as such although many projects bear names that include the concept of "integrated management", they rely only on regional approaches;
- lack of adequately trained human resource for understanding all aspects related to practice of integrated waste management, mostly in public authorities systems are implemented only based on operation systems and services like "thinking - planning - strategic planning" are outsourced. The interface between those who design and plan these systems and the body of officials or policy makers are often deficiencies of communication and interpretation, which are based on differences in professional training, vision and attitude.

Eco-Campia Turzii project started in 2002 should provide solid waste management in aries Urban Community, aiming to identify the type of waste generated on site and the provision, implementation of rules and procedures, training, providing of means for selective collection storage, waste delivery and monitoring of authorized firms.

Investment of 4.7 million euro from the County Council budget was finally ineffective. Power Pack machines purchased in 2002 without bidding, and which cost the county government budget of 4.7 million euro are physically and morally worn today without the work since 2005, although they arrived at Campia Turzii based on waste management strategy that County Council (CJ) had in 2004.

Now, that strategy is abandoned, thereby wasting significant amounts and time. In Eco-Campia Turzii project, was settled waste sorting station on March 4, 2009 and aims to continue achieving a ramp transfer and is considered extremely useful in the present conjuncture. Incoherent waste management policy leads to inefficiency in terms of investment made in this area. Such situations require special attention in order to achieve implementation of Environmental Acquis Communautaire.

### What to reflect about?

Considering the problems outlined above, we believe there is a need to implement an integrated waste management system that could solve some problems.

The operations within any waste management system are clearly interconnected. The collection and sorting method employed, for example, will affect the ability to recover materials or produce marketable compost. Similarly, recovery of materials

from the waste stream may affect the viability of energy recovery schemes. It is necessary, therefore, to consider the entire waste management system in a holistic way.

What is required is an overall system that is both economically and environmentally sustainable. The main principles in designing a sustainable solid waste management system are:

**1. Aim for the following:**

- environmental effectiveness: reduce environmental burdens,
- economic affordability: drive costs out.

**2. The system should be:**

- integrated: in waste materials, in sources of waste, in collection methods, in treatment methods, anaerobic digestion, composting, energy recovery, landfill, recycling,
- market oriented: materials and energy must have end uses and generate income,
- flexible: for constant improvement.

**3. Take care to:**

- define clear objectives,
- design a total system against those objectives,
- operate on a large enough scale

**4. Never stop looking for improvements in overall environmental performance and methods to lower operating costs.**

Remember that there is no perfect system.

The holistic approach (Forbes R McDougall et.al, 2003) has three main advantages:

1. It gives the overall picture of the waste management process. Such a view is essential for

strategic planning. Handling of each waste stream separately is inefficient.

2. Environmentally, all waste management systems are part of the same system – the global ecosystem. Looking at the overall environmental burden of the system is the only rational approach, otherwise reductions in the environmental burdens of one part of the process may result in greater environmental burdens elsewhere.

3. Economically, each individual unit in the waste management chain should run at a profit, or at least break even. Therefore, within the boundaries controlled by each operator, the financial incomes must at least match the outgoings. By looking at the wider boundaries of the whole system, however, it is possible to determine whether the whole system operates efficiently and whether it could run at break even, or even at a profit. Only then can all the constituent parts be viable, provided that income is divided up appropriately in relation to costs.

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## PROBLEMY ZWIĄZANE Z USUWANIEM ODPADÓW STAŁYCH NA TERENIE GMINY MIEJSKIEJ ARIEȘ W HRABSTWIE CLUJ

**Streszczenie:** Po zakończeniu Rewolucji Przemysłowej, w wielu społeczeństwach technologicznych pojawił się problem odpadów stałych spowodowany zmianą wzorca konsumpcyjnego. Część odpadów stałych które odnoszą się do samorządu miejskiego nazywamy komunalnymi odpadami stałymi. Artykuł podejmuje problematykę ich gospodarowania w gminie Arieș w Hrabstwie Cluj.

### Cluj 地区 aries 城镇社区固体废弃物处理问题

**摘要:** 在很多技术领域, 由于工业革命后的社会消费模式转变使得固体废弃物问题凸显。部分与自治区域有关的固体废弃物被称为市政固体垃圾。