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Illegal landfill sites in Poland

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ABSTRACT

This article focuses on illegal dumping sites in Poland. It also explains the difference between the illegal dumping site and a landfill site. It presents the dangers posed by illegal dumping sites. This study also shows the numbers of closed illegal dumps in the years 2008 – 2014, and the amounts of tonnes of municipal solid waste collected during the liquidation of these illegal dumping sites.

Keywords: landfill waste; illegal garbage dump; landfill of waste

1. INTRODUCTION

Pollution poses a problem on a global scale. Nowadays, production of waste is a constant phenomenon of human existence, because the human being is in fact the biggest producer of waste [1]. During the year, the amount of waste generated in Poland is significantly higher than the amounts given to our information [2]. This is the result of the fact that the significant amount of garbage goes to the so-called illegal dumping sites [3]. On the fields and in the nearby forests you can come across broken computers, phones, TV sets, refrigerators, worn out mattresses and many others things. Some of this waste poses a threat to the environment and human being [4]. Storing waste in landfill sites is the oldest and the most popular way aimed at the disposal of solid waste. Proceeding according to appropriate technological procedures allow safe disposal of industrial waste and municipal solid waste.

Current sanitary and environmental protection regulations require the construction and the use of landfills in such a way that the emission of pollution is reduced to minimum [5].

2. DIFFERENCE BETWEEN THE LANDFILL AND THE ILLEGAL DUMPING

Illegal dumping sites are not defined by law. However, we cannot forget that these places exist. In general, such dumps are the places where the waste is disposed illegally. In order to understand what the illegal landfills are and dangers they pose, it is important to recognise first what the landfills are [6].

Cz. Rosik – Dulewska believes that a landfill is a construction facility, used and situated according to binding regulations, in which distribution of waste with specific proprieties is planned [7]. This waste must be stored in a way which does not pose a threat to natural environment. The table below shows different types of landfills in Poland [8].

Table 1. Types of landfills in Poland.

| Type of a landfill | Characteristics |
|---------------------------|---|
| Controlled dumps | They function according to technical conditions and are planned in an appropriate way. They are sited with respect to geotechnical and hydrogeological suitability. |
| Semi - controlled dumps | They are characterized by the isolation of stored waste from the land by the management of the so-called geomembranes. Despite this, these landfills do not protect the environment sufficiently from gas and liquid substances. Semi – controlled dumps are temporary types of landfills. |
| Uncontrolled dumps | They occupy excavations or geological depression areas without additional specific preparation. Consequences of these types of dumps are the contamination of ground and surface water, inflated development of rodents and birds, the rapid release of gases into the atmosphere and contamination of the surrounding area by landfill dust and light-fraction shredder waste. |

Source. Frisch K.C., Klemper D. (2001), *Advances in Plastic Recycling*, Technomic Publishing. Own elaboration.

In contrast to the landfill each illegal dump is a source of various pollutants. The greatest danger pose the places selected at random, in which the waste is not protected. The protective layer does not separate illegal dumping sites from the soil, and thus they do not have any protective surface. They are not controlled by the Department of Sanitation (Sanepid) [9].

Illegal dumping sites arise spontaneously in different places, usually outside the city centres, but nearby houses, housing estates and by back roads. These illegal landfills are often regarded to be the greatest evil [10].

It is due to the fact that the fragrance coming from the place can be smelled within a few kilometres [11].

3. RISK ARISING FROM THE EXISTENCE OF ILLEGAL LANDFILLS

It is also worth noting how long it takes garbage to decompose. Bacteria and fungi need 6 months to decompose paper [12].

Candy wrappers decompose in time of 450 years, and plastic bottles break down in time of 100 to 1000 years. Time needed for decomposition depends on the type of plastic. The decomposition process of food cans takes up to 10 years, whereas in the case of beverage cans it extends up to about 1 000 years [13]. In a humid environment organic waste decomposes in time of 2 months to a year. Cigarette butts need about 1.5 years, whereas the poisonous substances in cigarette need about 5 years to break down [14].

Decomposition period of chewing gum lasts for 5 years, of carton of juice 10 up to 30 years, paper tissues need 3 months to break down, plastic disposable bag 100 – 120 years, bus ticket 3 – 4 months [15], leather clothes 30 – 50 years, painted boards – 13 years, string 3 – 14 months, woolen material 1- 15 years, disposable diaper 500 years, Styrofoam cup 50 years, a car tire 300 to 500 years. 4000 years is the period of time needed for decomposition of Glass [16].

Degradation of waste occurs together with the epidemiological and microbiological danger to the environment [17]. It also poses a threat of chemical contamination of groundwater and surface water, which as a result constitutes a danger for the local drinking water supply. Hazardous waste can be found on the illegal dumps, which include expired medications, packaging of automotive oil, paint packaging, used batteries, which lead to soil contamination with heavy metals [18].

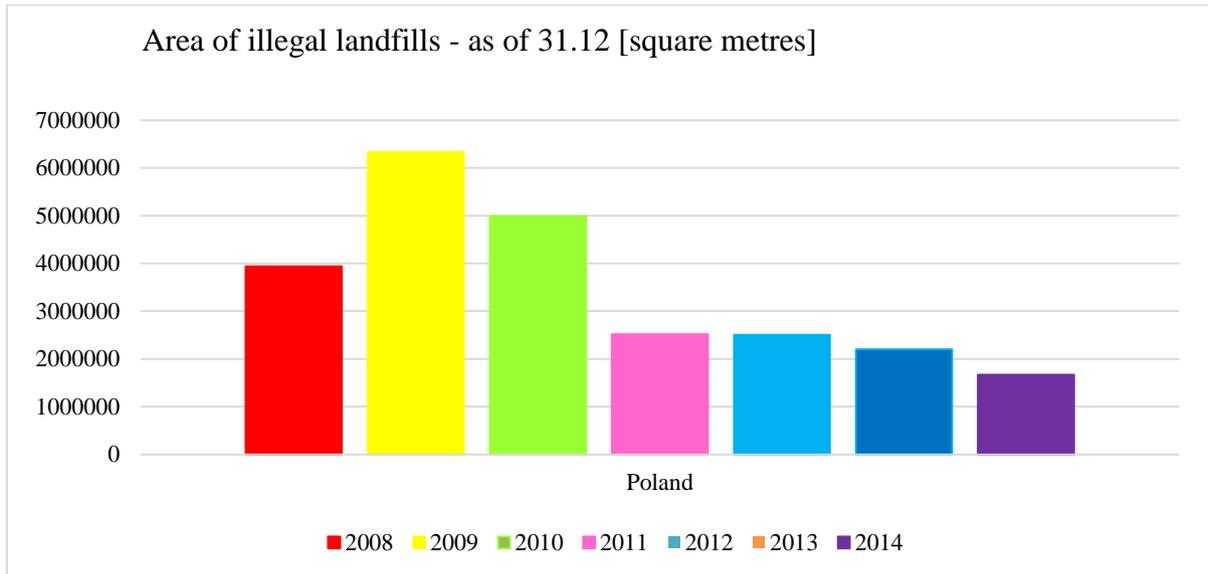
In the vicinity of such landfills you can note the increased concentration of chromium, copper, lead, cadmium and mercury. One battery can contaminate 1 m³ of soil or 400 litres of water. Bacteria found in calculators and watches contain about 30 % of mercury, which accumulates in testicles, liver and the brain (where it stays for the longest period of time – more than a year). It also absorbed through placenta and is excreted in breast milk [19].

Even a few milligrams of mercury, which leaked into the water or the soil can be fatal dose for people. Decaying organic substances cause not only unpleasant smell, but also ignition of fires [20].

4. ILLEGAL LANDFILLS IN POLAND IN THE YEARS 2008 – 2014

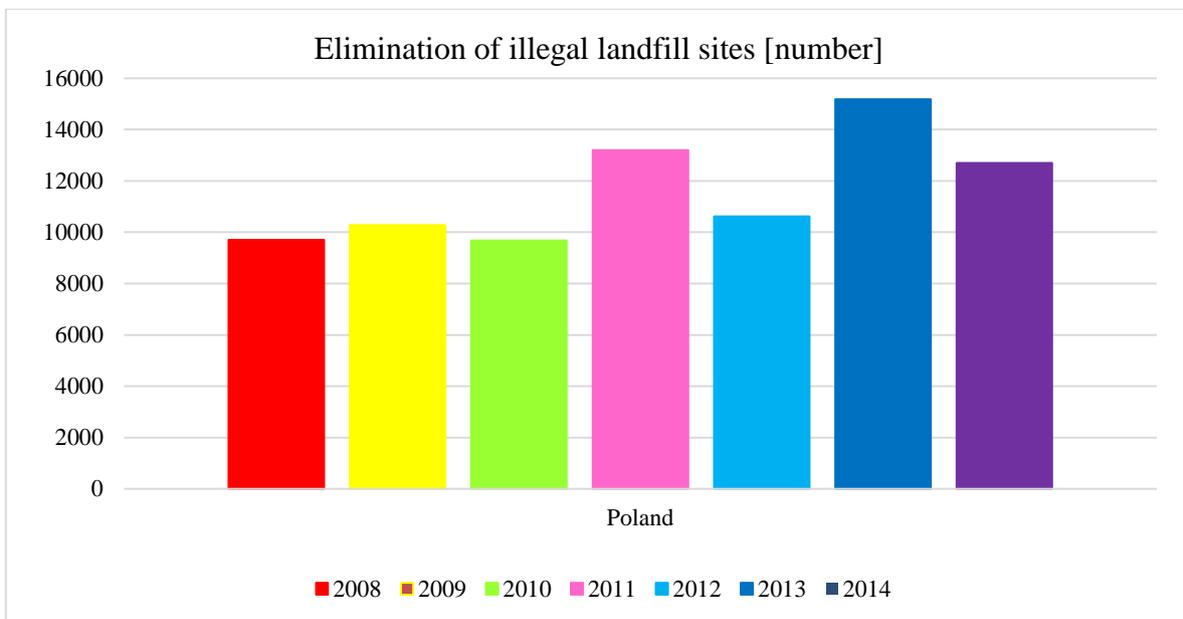
The area of illegal landfills in 2008 was 3 939 195 square metres. In 2009, the area was the biggest - 6 333 374 square metres. In 2010 it was 4 988 759 square metres, and a year later, 2 503 831 square metres. In 2013, the area decreased to 2 197 721 square metres, and in 2014 it was 1 667 553 square metres.

Graph 1. Area of illegal landfill sites – as of 31.12 [square metres].



Source: Own elaboration based on Central Statistical Office of Poland (Główny Urząd Statystyczny).

Graph 2. Elimination of illegal landfill sites [numbers].



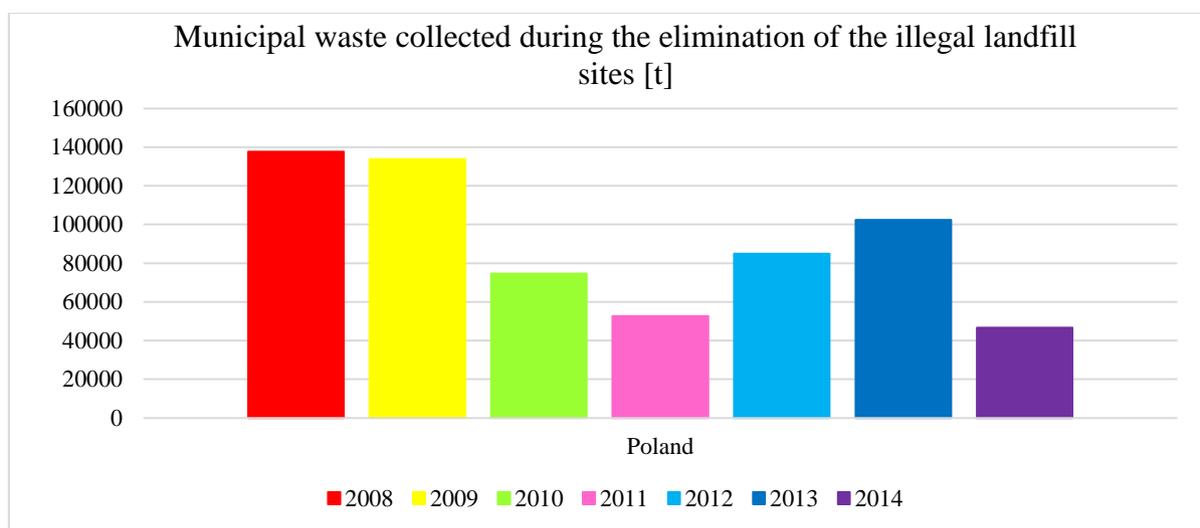
Source: Own elaboration based on Central Statistical Office of Poland (Główny Urząd Statystyczny)

It is the responsibility of local governments to remove the illegal landfills. Whereas, the problems relating to this matter rest on municipalities. According to the Waste Law administrators and landowners should take care of order on their areas.

When the information about the illegal landfills is reported to the City Council, actions aimed at the elimination of these landfills are implemented. If this kind of dumping is located on private land, Municipal Police is responsible for the execution, whereas when it is located on the municipal area, the landfill is closed down on the command and at the expense of the City Council.

Most, 15 178 illegal landfill sites were closed down in 2013. In 2011, 13 202 such landfill sites were removed, and in 2014 - 12 707. The least, 9 705 illegal dumps were removed in 2010.

Graph 3. Municipal waste collected during the elimination of the illegal landfill sites [t]



Source: Own elaboration based on Central Statistical Office of Poland (Główny Urząd Statystyczny)

632 829,80 tonnes of municipal waste were collected while closing down the illegal dumping sites in Poland in 2008 -2014. Most waste was collected in 2008 – 137690 tonnes, and least in 2014 – 46 642 tonnes.

5. CONCLUSIONS

Illegal landfill sites greatly underestimate landscape values of local areas. Despite of implementation of innovative methods of waste management in municipalities, their effective enforcement is still not a simple task. Due to the fact that the landfill site is an object of considerable capacity and space, its construction process is complex and technically very difficult to carry out. It is important that the landfill sites were impermeable and affected the environment minimally.

References

- [1] Morrissey A., Browne J. (2004). Waste management models and their application to sustainable waste management, *Waste Management*, 298-301.
- [2] Asanuma M., Ariyama T. (2004). Recycling of waste plastics in blast furnace, *Journal of Japan Institute of Energy*, 83(4), 252-254.
- [3] Aznar M. P., Caballero M. A., Sancho J. A., Francs E. (2006). Plastic waste elimination by co-gasification with coal and biomass in fluidized bed with air in pilot plant, Elsevier, 409-412.
- [4] Döberl G., Huber R., Brunner P.H., Eder M., Pierrard R., Schönback W., Frühwirth, W., Hutterer, H. (2002). Long-term assessment of waste management options – a new, integrated and goal-oriented approach, *Waste Management & Research*, 311-320.
- [5] Wang JY., Kang XP., Tam VWY. (2008). An investigation of construction wastes: an empirical study in Shenzhen. *Journal of Engineering, Design and Technology*, 6(3), 227-236.
- [6] Hoornweg D., Bhada-Tata P., Kennedy C. (2013). Environment: waste production must peak this century, *Nature*, 615.
- [7] Frisch K.C., Klemper D. (2001). Advances in Plastic Recycling, Technomic Publishing, 143.
- [8] Andrews W. J., Masoner J. R., Cozzarelli I. M. (2012). Emerging contaminants at a closed and an operating landfill in Oklahoma, *Ground Water Monit., Remediat*, 120-130.
- [9] Ferre-Huguet N, Nadal M, Schuhmacher M. (2006). Environmental impact and human health risks of polychlorinated dibenzo-p-dioxins and dibenzofurans in the vicinity of a new hazardous waste incinerator, A case study. *Environ Sci Techn*, 61-66.
- [10] Kirkeby JT., Brigisdottir H., Hansen TL., Christensen TH., Bhandar GS., Hauschild M. (2006). Environmental assessment of solid waste system and technologies, EASEWASTE, *Waste Management and Research*, 7.
- [11] Björklund A., Finnveden G. (2005). Recycling revisited – life cycle comparisons of waste management strategies, *Resources, Conservation and Recycling*, 309-313.
- [12] Ibenholt K., Lindhjem H. (2003). Costs and Benefits of Recycling Liquid Board Containers, *Journal of Consumer Policy*, 320.
- [13] Alexander Jr. E. C. (2009). Groundwater sensitivity and solid waste disposal in Minnesota, Stuart Grubb, Friends of Washington County, USA, 14.
- [14] Marsili D, Fazzo L, Comba P. (2009). Health risks from hazardous waste disposal: the need for international scientific cooperation., *Eur J Oncol*, 151.
- [15] Frączek K, Ropek D (2011). Municipal waste dumps as the microbiological threat to the natural environment, *Ecol Chem Eng S* 18(1).
- [16] Central Statistical Office of Poland: <http://stat.gov.pl/en/>

- [17] Nakasugi O., Kumura T., Kenmotsu K., Fukui H., Nagase M., Kawagoshi, M. (1999). Organic Components in Leachates from Hazardous Waste Disposal Sites, *Waste Manag Res*, 189.
- [18] Sahlin, J., Knutsson, D. Ekvall, T. (2004). Effects of planned expansion of waste incineration in the Swedish district heating systems. *Resources, Conservation and Recycling*, 279-281.
- [19] Kawai S., Shimaoka T., Yamawaki A. (2014). Geotechnical Stabilization of Illegally Dumped Solid Waste Mixed with Soft Plastics, *Eurasia 2014 Waste Management Symposium*, 467.
- [20] Pohl HR., Tarkowski S., Buczynska A., Fay M., De Rosa CT. (2008). Chemical exposure at hazardous waste sites: experiences from the United States and Poland, *Environmental Toxicology and Pharmacology*, 283.

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