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WASTE MANAGEMENT IN THE GORLICE COUNTY

Abstract. The paper deals with issues related to environmental pollution and awareness of the society about the dangers of poor waste management. Hence, the aim of the research was to find out the opinion of the community of Gorlice County in south-eastern Poland on waste management. The awareness of the inhabitants of the Gorlice powiat in terms of waste, its harmfulness and methods of its management is growing. Realized inhabitants are guided by respect for health, well-being and environmental protection.

INTRODUCTION

Waste management covers a number of activities related to the handling of waste, from its production to management through the recovery of secondary raw materials and its safe disposal for the environment and humans [1,2]. The issue of waste management due to their quantity, diversified composition and properties is complex and complicated. This is mainly due to two closely related reasons. The first relates to the increase in the mass of waste along with the increasing number of people, economic development, as well as the increase in the welfare of the society. The second one is related to the nuisance and risk of waste, especially hazardous to the environment, and thus to humans. Therefore, one should strive to establish detailed and precise legal and organizational rules for dealing with various types of waste, which should also translate into the application of these provisions in practice [3,4]. In waste management processes, waste prevention is preferred, and landfilling is the least desirable. However, all economic human activity is now inextricably linked with the production of waste. The increase in the amount of produced waste has been recorded in the countries of Western Europe and the USA since the beginning of the 1950s and reached its peak in the second half of the 1980s [4]. According to Krupnik [5], the waste management system should be based on the prevention, reduction and minimization of their production. Everyone who designs, produces, sells has the primary responsibility to prevent or reduce waste [6]. The waste that cannot be avoided should be prepared for reuse. If waste does not qualify for reuse, it should be recycled or otherwise recovered, such as energy recovery [7]. However, when neither of the previous methods is possible, the waste should undergo appropriate

treatment processes [8]. Currently, ecological issues are becoming more and more popular. This is related to the growing awareness of the society about the risks that may result from poor waste management. Hence, the aim of the research was to find out the opinion of the South-Eastern Poland community on the natural environment, including waste management.

MATERIAL AND METHODS

The work was based on a questionnaire survey and statistical data from the Małopolskie voivodship. The survey was conducted among the inhabitants of the communes of Gorlice powiat: Biecz and Uście Gorlickie, where there are landfills in their area. A questionnaire form was used, containing 25 questions, both open and closed. The survey was conducted among a population of 1000 people in June-July in 2021. The questions concerned, among others: the distance of their place of residence from the landfill, the smell from the landfill, the occurrence of diseases related to the presence of the landfill in the immediate vicinity, of the increase in the population of rodents, insects in the commune due to the presence of the landfill and the impact of the landfill on their well-being. Most of the people participating in the survey were men (64,7%), aged 30-60 (60,4%), 34% were respondents aged > 60 and only 5.6% were respondents under 30 years. Thus, at least half of the respondents had some life experience. The place of residence of the respondents, in relation to the location of the landfill, varied. 13,7% of the respondents lived within 600 m from the landfill site; 9% of people – within 600-1000 m; 20,8% of respondents – within 1-2 km, while as many as 56,6% of respondents lived more than 2 km from the landfill. In the population of the respondents, 60,1% had vocational education; 21,3% – secondary education; 15,3% – primary, and the remaining 4,3% – higher education. The collected data was analyzed mainly with the SPSS package and Microsoft Office Excel.

RESULTS

Waste management In the opinion of the respondents

According to the respondents who live more than 2 km from the landfill, the presence of landfills in their municipalities does not bother them (67%). Other residents, on the other hand, whose farms are located in close or very close proximity to the landfill, find this presence very disturbing.

The respondents felt the nuisance of the landfill in various ways. Among the respondents, as many as 61,7% of the respondents stated that they did not feel any unpleasant smell, and only 39,3% of respondents felt this smell, especially in the summer period, when there is the most waste and high air temperature.

Most of the respondents (74,7%) stated that they did not feel the impact of the landfill on their health, while 26,3% of people noticed that they felt bad only in hot weather.

An increased number of rodents and insects in the vicinity of the landfill was noticed by 100% of respondents, with 77,9% of respondents noticing more insects, and 22,1% of people noting an increased number of rodents. This proves very favorable conditions for the reproduction of insects and rodents in the

vicinity of the nearest landfill. The vast majority of respondents (65%) stated that the landfill is properly secured (fenced and controlled).

When asked whether unauthorized persons may enter the municipal waste dump, the majority of respondents (57,9%) stated that no one, except employees, should have access to the municipal waste dump. Such an answer was given mainly by respondents from the Uście Gorlickie commune, where the dump is secured, well guarded and no one except the employees has access there. 43,1% of the respondents answered positively to this question. They were mainly respondents from the Biecz commune, where the landfill is not fenced and secured.

Among the respondents, as many as 72,1% of people said that they were not interested in the times when companies operating the landfill bring waste. They were respondents living on farms far away from the landfill site and therefore were not interested in the time of waste collection. Other inhabitants (27,9%) were of the opposite opinion, they were respondents whose farms were in the immediate vicinity of the landfill.

The respondents, when asked if they would now consent to the construction of a landfill in their commune, responded mostly negatively (71,8%), while 28,2% of the inhabitants answered that they did not care.

Type and quantity of waste subjected to recovery processes

According to WSO data (2021) it was recovered in the poviát Gorlice approx. 0,9 million Mg of waste from groups 01-19. In terms of quantity, the greatest amount of waste was recovered from Oil re-refining or another reuse (group 9) – 59,18%. Subsequently, these were waste from group 12 (Exchange of waste for any of the processes listed in R 1 to R 11). Recycling or recovery of metals and metal compounds (R4). Only slightly more than 28% of waste was processed in this way. The first method (use mainly as a fuel or other means of generating energy) was only 0,08% (table 1).

Table 1

List of hazardous waste recovery methods used in 2021 in the Gorlice poviát

Methods	Process name	Waste weight (%)
R1	Use mainly as a fuel or other means of generating energy	0,08
R2	Solvent recovery / regeneration	0,01
R4	Recycling or recovery of metals and metal compounds	2,84
R9	Oil re-refining or another reuse	59,18
R12	Exchange of waste for any of the processes listed in R 1 to R 11	37,89
	Total	100,00

Source: Anonymous [9]

Due to the diversity of non-municipal biodegradable waste, various methods of preventing the generation of such waste are used (modernization of the

technologies used in the production and processing processes is of great importance in this respect).

Conclusions

1. Ailments related to the presence of waste in the study area are not frequent, but their ailments are more and more often articulated.
2. The increased number of insects and rodents, and the unpleasant smell makes
3. the inhabitants of communes believe that building a landfill near their farms is inadvisable.
4. The awareness of the inhabitants of the Gorlice powiat in the aspect of waste, its harmfulness and methods of its management is increasing. The inhabitants are guided by respect for health, well-being and environmental protection.

Used information sources:

1. Szydłowski K., Podlasińska, J. 2017. *Oddziaływanie nielegalnych wysypisk śmieci w północnozachodniej części gminy Barlinek na zawartość metali ciężkich w glebie. Inżynieria Ekologiczna, 18(1), s. 166–174. (in Polish)*
2. Zalewska J. 2019. *Waste management system in Poland - current state and directions of improvement, Ekonomika i Organizacja Logistyki, 4(1), 2019, 103–113. DOI: 10.22630/EIOL.2019.4.1.9. (in Polish)*
3. *Ustawa z dnia 14 grudnia 2012 r. o odpadach, Dz. U. 2013 poz. 21 ze zm.*
4. Toruński J. 2010. *Zarządzanie gospodarką odpadami komunalnymi w Polsce. Zeszyty Naukowe Uniwersytetu Przyrodniczo- Humanistycznego w Siedlcach, Administracja i Zarządzanie, 14(87), 31–47. (in Polish)*
5. Krupnik D. 2015. *Wybrane zagadnienia dotyczące systemu gospodarowania odpadami i transgranicznego ich przemieszczania, Systemy Logistyczne Wojsk 42, 108–121. (in Polish)*
6. Więclawska J. 2015. *Spektakularne metamorfozy składowisk odpadów, <https://portalkomunalny.pl/spektakularne-metamorfozy-skladowisk-odpadow-316374/3/> [accessed: 06.04.2022]. (in Polish)*
7. Malinauskaite J., Jouhara H., Czajczyńska D., Stanchev P., Katsou E., Rostkowski P., Anguilano L. 2017. *Municipal solid waste management and waste-to-energy in the context of a circular economy and energy recycling in Europe. Energy, 141, s. 2013–2044.*
8. Styś T., Foks R. 2014. *Rynek gospodarowania odpadami komunalnymi w Polsce. Perspektywa 2030, Instytut Sobieskiego, Warszawa 2014. (in Polish)*
9. *Anonimous 2016. Waste management plan of the Małopolskie voivodship for 2016-2022. Krakow 2016, https://www.malopolska.pl/_userfiles/uploads/PGOWM_2016-2022.pdf (accessed 05.-5.2022) (in Polish)*