

## The research of Illegal dumps in some parts of the territory of Kosovo

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*Abstract:* -The waste management system in Kosovo is in an unsatisfactory situation, which presents a major problem for the country. The population covered with waste collection services is approximately around 50%. The lack of collecting and treating waste generated in the last decade has created a bad image in aesthetic and environmental pollution. The amount of waste landfills, in such sites, has been estimated to be over 250,000 tons per year[7]. This study has been conducted, in order of detecting illegal waste dumps in the Republic of Kosovo. This means that a huge amount of waste is burnt, either through rivers or in inappropriate places, such as illegal landfills. The major contributors of the illegal dumps, are; building contractors, demolition, remodeling, roofing, and waste management companies. The areas/lands around the landfill have greater opportunities to contamination and groundwater. Many of the products that have toxic origin, and heavy metals, such as, arsenic, zinc, copper, selenium, are harmful to the environment. The Law on Waste obliges municipalities to issue a register of illegal landfills in their territory within a period of one year[12]. In 16 municipalities a total of 1062 illegal landfills were identified. In Drenas, most of the illegal landfills occupy a huge surface of more than 400 m<sup>2</sup>. Based on the results, we can conclude that a huge amount of waste is not going to the landfills, but are thrown away by the population.

*Key-words:* -Illegal landfills, Kosovo municipalities, waste, KEPA, dumpsites, solid waste etc.

### 1 Introduction

Lifestyles due to the growth of the population welfare generate an increasingly household solid waste [1]. The waste management system, in Kosovo, is in an unsatisfactory situation, which presents a major problem for Kosovo. The lack of collecting and treating waste generated in the last decade has created a bad image in aesthetic and environmental pollution. The waste management has not yet been reached to cover the whole country. The lack of waste management system, in Kosovo, is estimated as a result of a number of factors; the lack of network management, lack of technical and financial means, low rate payment and lack of waste law implementation. The amount of waste landfills, in such sites, has been estimated to be over 250,000 tons per year. These dumps are known as open dumps; involve improper and illegal disposals of waste. According to the study, the major contributors of the illegal dumps, are; building contractors, demolition, remodeling, roofing, waste management companies or general contractors to

transport waste transfer station operators, vehicle repair, and in particular local residents[2].

In my country, similar to many developing countries, the operation and management of municipal solid waste (MSW) collection services are fairly rudimentary. This is reflected by the lack of information about the quantities and types of MSW collected, the amounts recovered, recycled and/or reused, and the siting of MSW disposal sites[3].

Approximately, the population covered with waste collection services is around 50%. The efficient municipal solid waste management systems require professional management, supported by an informed population and appropriate legislation and policies [4]. Thus, solid waste management is one of the most challenging issues in urban cities, which are facing a serious pollution problem.

The areas/lands around the landfill have greater opportunities to contamination and groundwater. Many of the products that have toxic origin and heavy metals, such as, arsenic, zinc, copper,

selenium, are harmful to the environment[5]. Furthermore, most urban wastes are still disposed into landfills, which have a finite capacity and were originally located relatively close to the urban areas [6]. This means that a huge amount of waste is burned either through rivers or in inappropriate places as illegal landfills[7].

The Law on Waste obliges municipalities to issue a register of illegal landfills in their territory within a period of one year (Art. 81). The municipal environmental inspectors are responsible for doing so (Art. 62). For this, they often cooperate respectively by the staff from the Regional Waste Collection Companies.

The administrative supervision is within the Ministry of Environment and Spatial Planning (Art. 61) with its environmental inspectors. Here, the Kosovo Environmental Protection Agency (KEPA) is the national body where the data is reported to (Art. 14, 1.7-1.8). KEPA is obliged to create a database on waste management and to compile reports. Their report on it in their annual environmental report and also verify reported dumpsites, however relying on the self-reporting of municipalities. Randomized own investigation are not carried out regularly. During 2013, KEPA has identified all illegal landfills in the territory of Kosovo. These identification have been conducted 34 municipalities of Kosovo, excluding Leposaviq, Zubin, Potok, and Zvečan. In total there were identified 400 illegal landfills, with a total area of 301.18 hectares[7]. Lipjan is the municipality with the greatest surface area of illegal landfills, while the Municipalities of Gjilan and Mamushë have the smallest surface area of illegal waste landfills.

The main objective of this study was:

- To establish a baseline assessment of illegal dumpsites of undisputed data quality for the 16 partaking municipalities.
- As illegal dumpsites are a major nuisance for the citizens and visitors of Kosovo, the final data shall also be used as awareness, raising tool to trigger a change in policy, management and social behavior.
- To establish a process of data collection and monitoring that is owned and followed-up by the Government- Kosovo Environmental Protection Agency.

The exact number of illegal landfills evidence will help in identifying other unknown information, at the moment, such as, determining the structure of the composition of the landfill, discharge of pollutants in soil and water, waste disposal impact on the value of property, economic impact and

health in the local community and the cost of their rehabilitation[2].

Thus, the estimated amount of waste being placed on illegal landfills or burning them in Kosovo, resulting in 345,000 tons of CO<sub>2</sub> emissions, about 11,000 tons of CH<sub>4</sub>, about 2,300 tons of PM<sub>10</sub> and 0.12 kg of dioxins. Kosovo annual damage associated with waste management systems is estimated to be from 5.2 to 9.5 million € or 0.12 to 0.23 % of GDP for 2010 which is attributable to PM's and dioxins to air pollutants[8].

Otherwise, the environmental impacts of illegal waste disposal led to the deterioration of land, as well as, ground and surface water, also impacting the air quality. Waste impact depends on waste composition and illegal disposal practices [9].

A large number of illegal dumpsites have been created since 1999-2016, and in order of eliminating the previous ones, it has required a political will from the central and local management plans and financial tools.

There is a unique system of waste management, especially in some developed countries of the European Union. This system is necessary to be developed in Eastern Europe, where as a respectful basis they use the Directive on waste management.

Numerous European documents and regulations promote a respect for the hierarchy, as an inevitable and good opportunity for the best practices of waste management, financial mechanisms, technology selection and stakeholders. This would affect the observance and enforcement of a circular economy, as an effective method for minimizing the generation of waste[8].

## 2 Methodologies

In order to ensure a collection of reliable baseline data comparable across municipalities, experts from Kosovo Environmental Protection Agency, Municipalities and Regional Waste collection Companies were engaged on data collection, data collection methodology and monitoring system. For this assessment, the following were applied:

**Scope:** All roads in the 16 municipalities accessible by standard cars (i.e. not four-wheel drive) were assessed. This amounts to ca. 10,000 km in total. A routing has been agreed on, in advance, to ensure an efficient assessment.

**Data collection:** The following data points of each dumpsite were collected:

- **Photo proof:** Each dumpsite was photographed. Panoramic or multiple pictures were taken when necessary.
- **Geo-reference:** Each dumpsite was geo-referenced by the indication of Latitude and Longitude. The decimal second was indicated (e.g. 42°65'52, 87").
- **Municipality:** The name of the municipality where the dumpsite has been found was indicated.
- **Amount:** Data collectors were indicated either:
  - o Small: 1-5 200l bags/wheelbarrows needed
  - o Medium: 5-20 200l bags/wheelbarrows
  - o Big: > 20 wheelbarrows, i.e. truck needed
- **Size:** Data collectors were indicated either:
  - o 1-49 m<sup>2</sup>; i.e. up to 7m x 7m or the like
  - o 50-400 m<sup>2</sup>, i.e. up to 20 x 20 m or the like
  - o >400 m<sup>2</sup>
- **Fractions:** Data collectors were indicated as one or more of the following:
  - o Household waste
  - o Inert/construction waste
  - o Industrial and hazardous waste
  - o Bulky waste
  - o Other (to be specified in comment section)

### 3 Data Validation

The collected data were submitted in a way so that they are accessible by designated Kosovo Environmental Protection Agency and GIZ. The data point's were validated in terms of fulfilling the definitions above and were ensured that there were no double entries or mismatches between geo-reference and picture. For each data point found void, a reason has been provided[10].

The following municipalities were part of this research:

Drenas, Ferizaj, Fushe-Kosova, Gračanica, Istog, Kaçanik, Klina, Lipjan, South Mitrovica, Obiliq, Peja, Podujeva, Prishtina, Shtime, Skënderaj, and Vushtrri.

The settlements and territories of these municipalities were assessed with the largest

number of illegal waste dumps. Illegal waste landfills cover a surface of sensitive environment, including the proximity to rivers, natural landscapes, working lands and land pastures, near the roads. Illegal waste landfills are as a result of mismanagement, lack of management settlement expansions in their municipalities. Illegal landfills are still in the outside of the management control, with the exception of a few symbolic actions for their elimination.



Fig.1, The map of the municipalities

### 4 Results

For a month, 8 teams conducted an investigation and identification of illegal landfills in 16 municipalities. In total, 1062 illegal landfills were identified. The municipalities of Drenas (137), Peja (123) and Lipjan (105), were the municipalities that had most illegal dumpsites, whereas, municipalities of Shtimje (27), Graçanica (32) and Kaçanik (35) were municipalities that had the lowest number of illegal dumpsites. The municipalities of the Northern part of Kosovo have not been engaged in this study. However, in this study, the majority of the Western and Eastern part of Kosovo have been conducted. The central part of the country is known as the main industrial-energy development and mining. In this part of the country it is known that the environmental pollution is higher, not only the discharges into air, but also in water and soil.

In the fig. 2-3 the total number of illegal landfill for all of the municipalities are conducted.

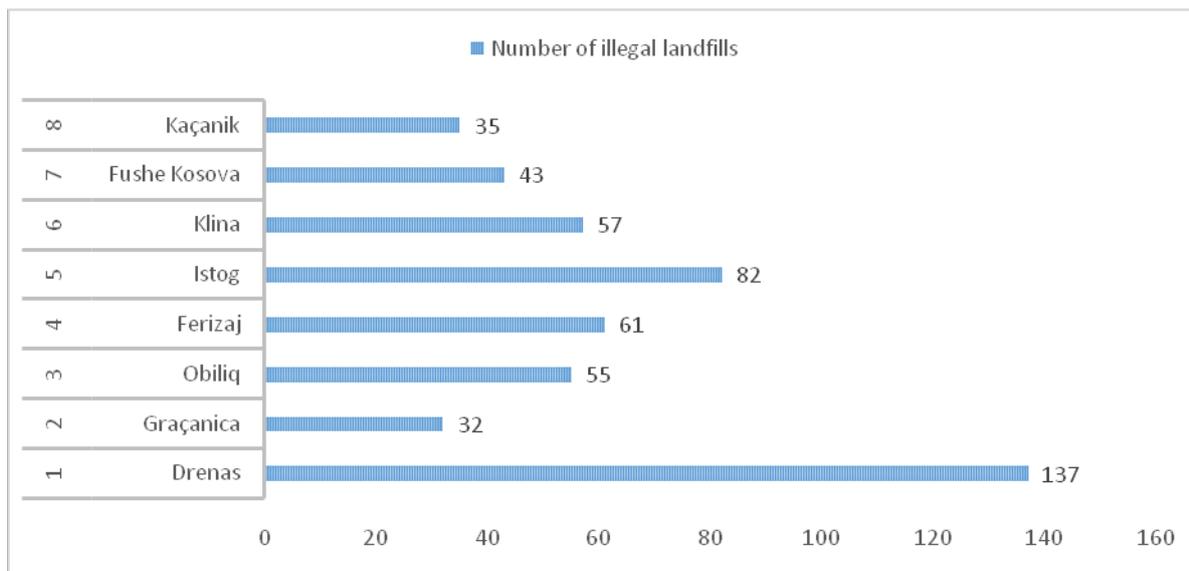


Fig.2, The number of illegal landfills per municipality

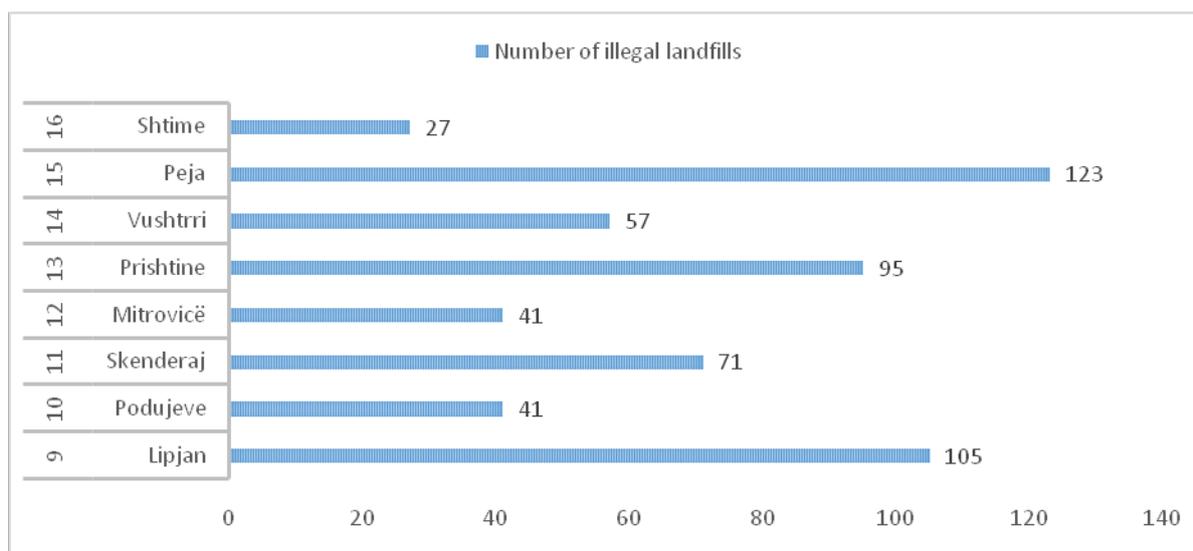


Fig.3, The number of illegal landfills per municipality

According to the results in Fig.2-3, the territories of 16 municipalities are resulting in a large number of illegal landfills. This number ranges from 27-137 with illegal landfills. The municipalities that have resulted with the most illegal landfills are: Drenas, Peja, Lipjan, Istog, Prishtina, Skenderaj. As we can see from fig. 4-5, the amount of waste in most of the illegal landfills identified in this study is big or medium in all municipalities. Only in Fushe Kosovo municipality the amount in these dumpsites were low.

In Fig. 4, the percentage of illegal landfills has been categorized based on the amount of waste, as: The largest amount with over 20 sacks was registered in Istog with 70.7% and in Drenas with 66.4%. The average amount of waste is registered in Graçanica with 5-20 bags of 62.5% and 53.3% in Fushe Kosova.

The biggest volume of illegal waste landfills of 1-5 sacks has been registered in Fushe Kosova with a percentage of 38.6.

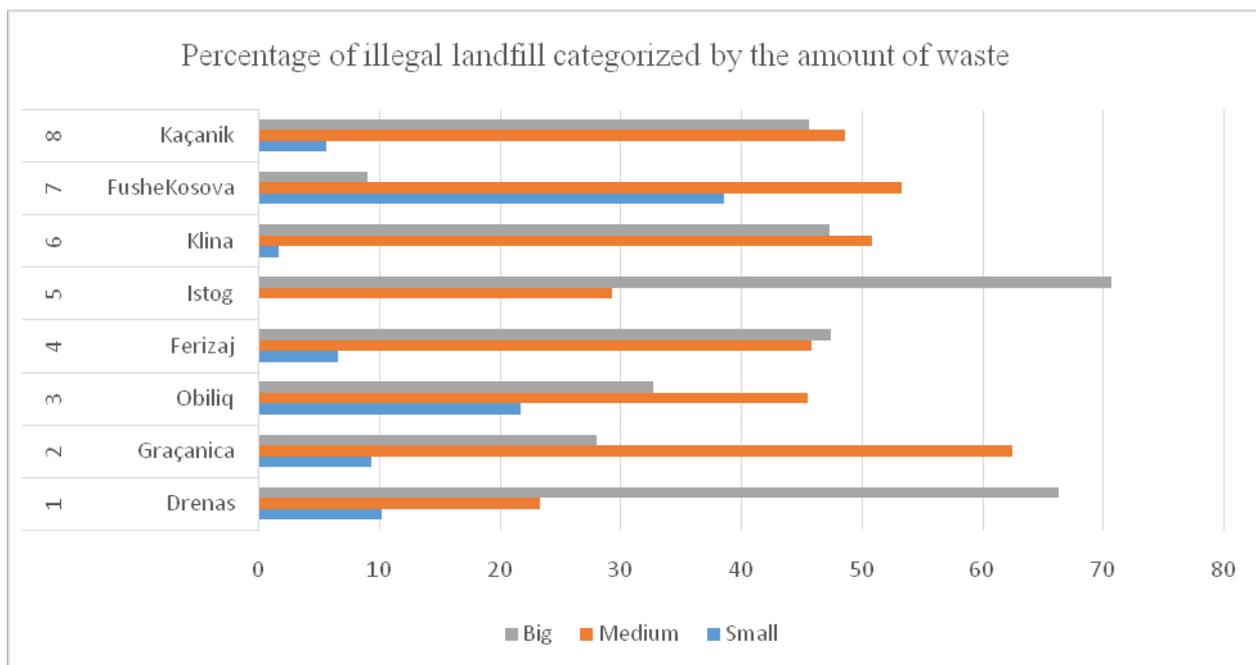


Fig. 4, The percentage of illegal landfill categorized by the amount of waste

In Fig. 5, the highest percentage of illegal landfills based on the amount of waste in the municipalities, has resulted; the largest amount with over 20 bags have been registered in Pristina with 82.1%, while in Peja with 57.3%.

The average amount of waste with 5-20 sackshas been registered in Skenderaj with 54.9%, in Vushtrri with 54.4% and Lipjan with 51.4%. The biggest volumes of illegal landfill waste, with the highest levels were registered in Podujeva with 1-5 sacks, with a percentage of 51.2%.

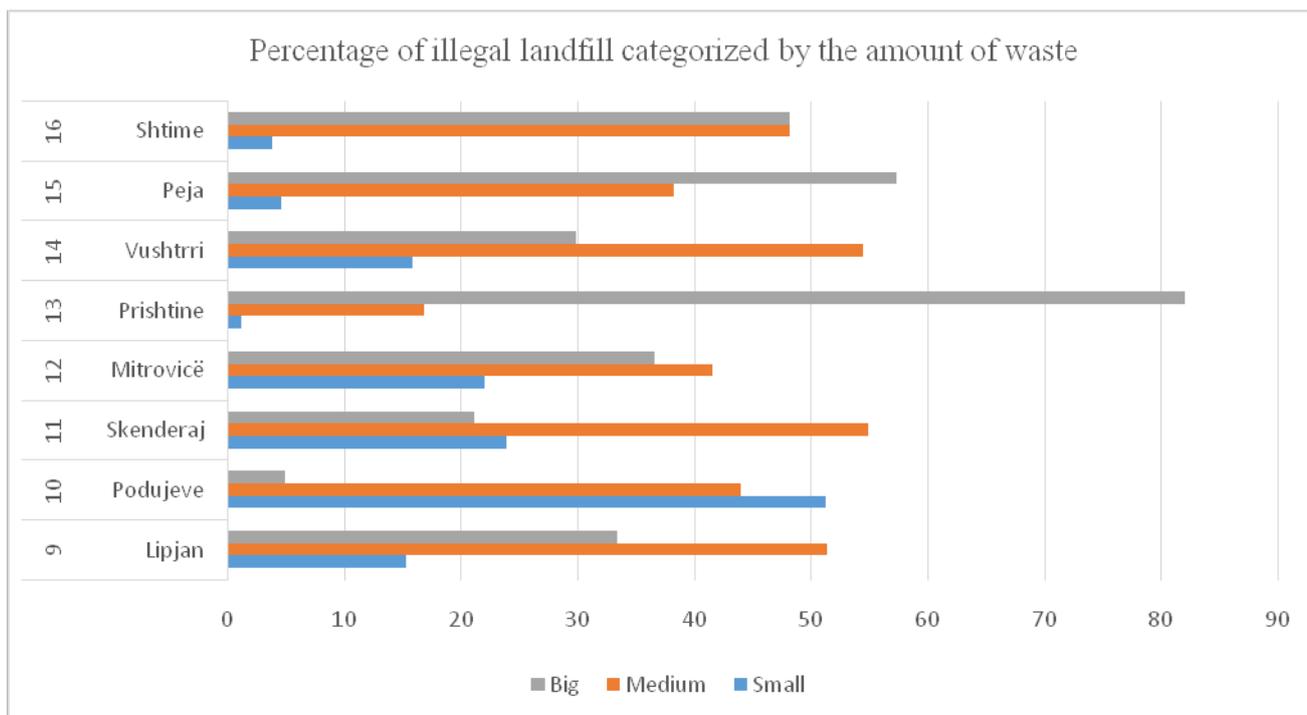


Fig.5, Percentage of illegal landfill categorized by the amount of waste

Dumpsites surface were mixed and varied from the lowest one to the biggest one. In the Drenas municipality most of the illegal landfills have a huge surface with more than 400 m<sup>2</sup>, despite in Podujeva

and Fushe Kosova most of them were small with 1 to 49 m<sup>2</sup> surface.

The type of waste in these illegal landfills is mostly household waste and internal waste (construction waste).



Fig.6, Illegal waste landfills in Skenderaj



Fig. 7, Illegal waste landfills in Mitrovica

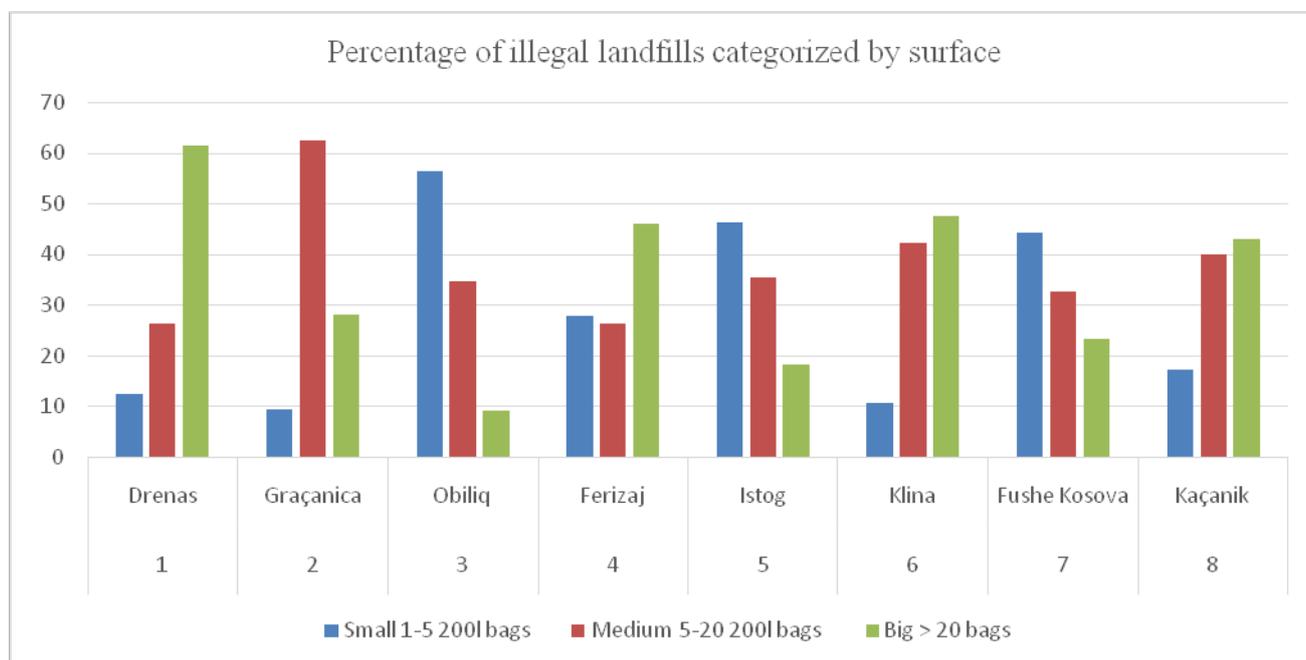


Fig.8 Percentage of illegal landfills categorized by surface

In Fig. 8, the highest percentage of illegal landfills, based on the amount of waste, has resulted as: a surface covered with the amount of waste has registered over 20 sacks in Glogovac with 61.3%

and 47.4% in Klina. An occupied area of 5-20 garbage sacks have been registered in Gračanica with 62.5%, while in Obilic, the surface area occupied with waste has 1-5 sacks, which is 56.4%.

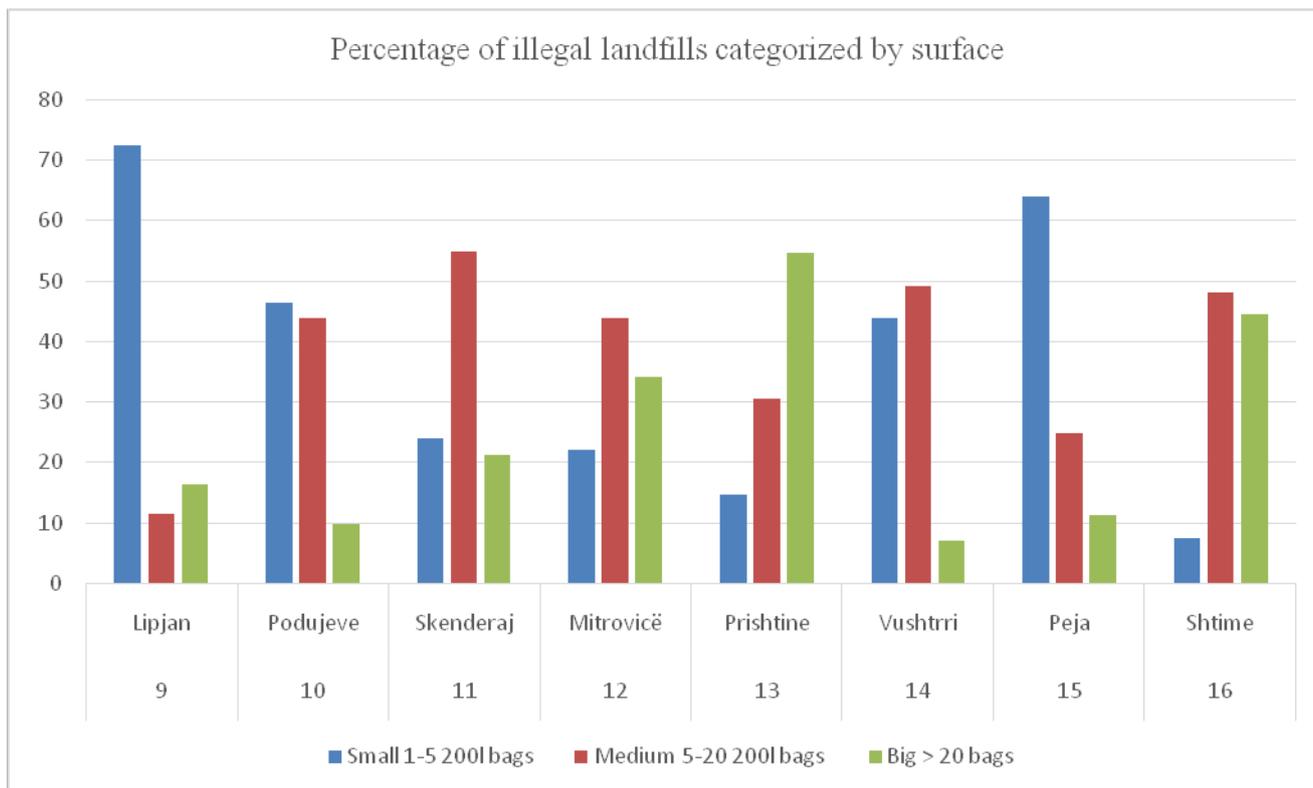


Fig.9,Percentage of illegal landfills categorized by surface

The occupied area of 5-20 garbage bags has been registered in Gračanica with 62.5%, while in Obiliq, the surface are occupied with waste has 1-5 sacks with 56.4%.The occupied area of 5-20 garbage sacks

with the highest records, in Skenderaj with 54.9%, while the occupied area with 1-5 garbage sacks is the highest in Lipjan with 72.4% and Peja with 64%.

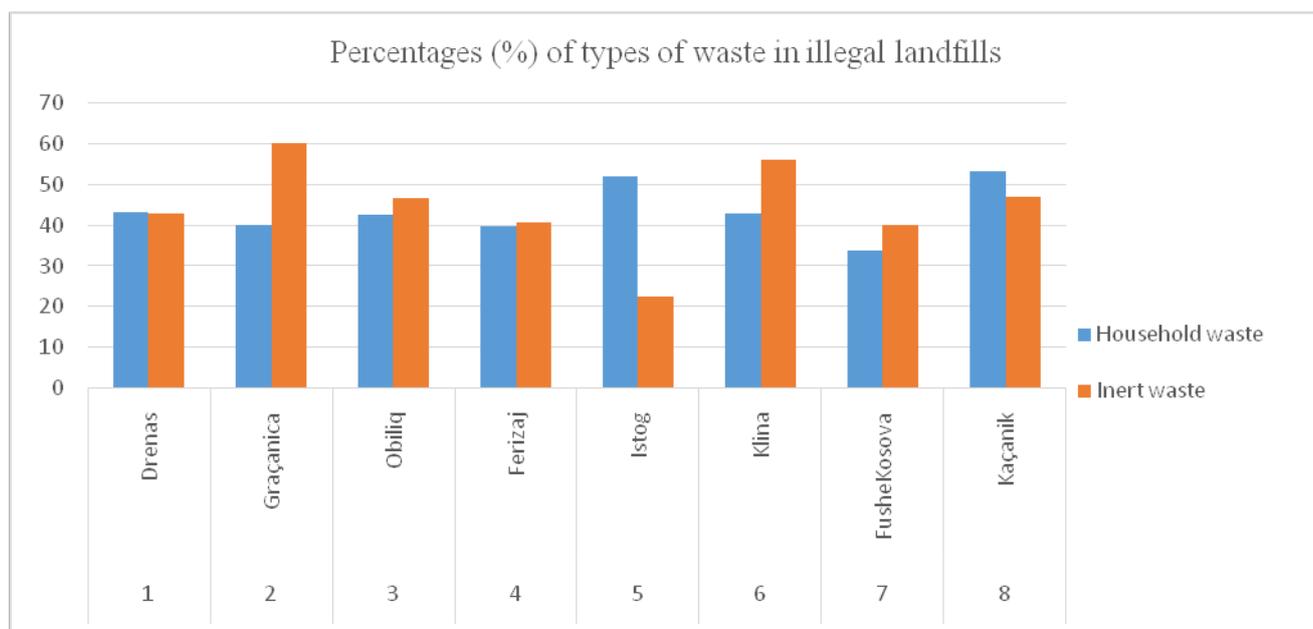


Fig. 10, Percentages of types of waste in illegal landfills

In Fig. 10, we can see that the highest percentage of Household Waste is registered in Kaçanik with 53.1% and in Istog with 51.8%. The highest

percentage of inert waste was registered in Gracanica with 60% and in Klina with 56%.

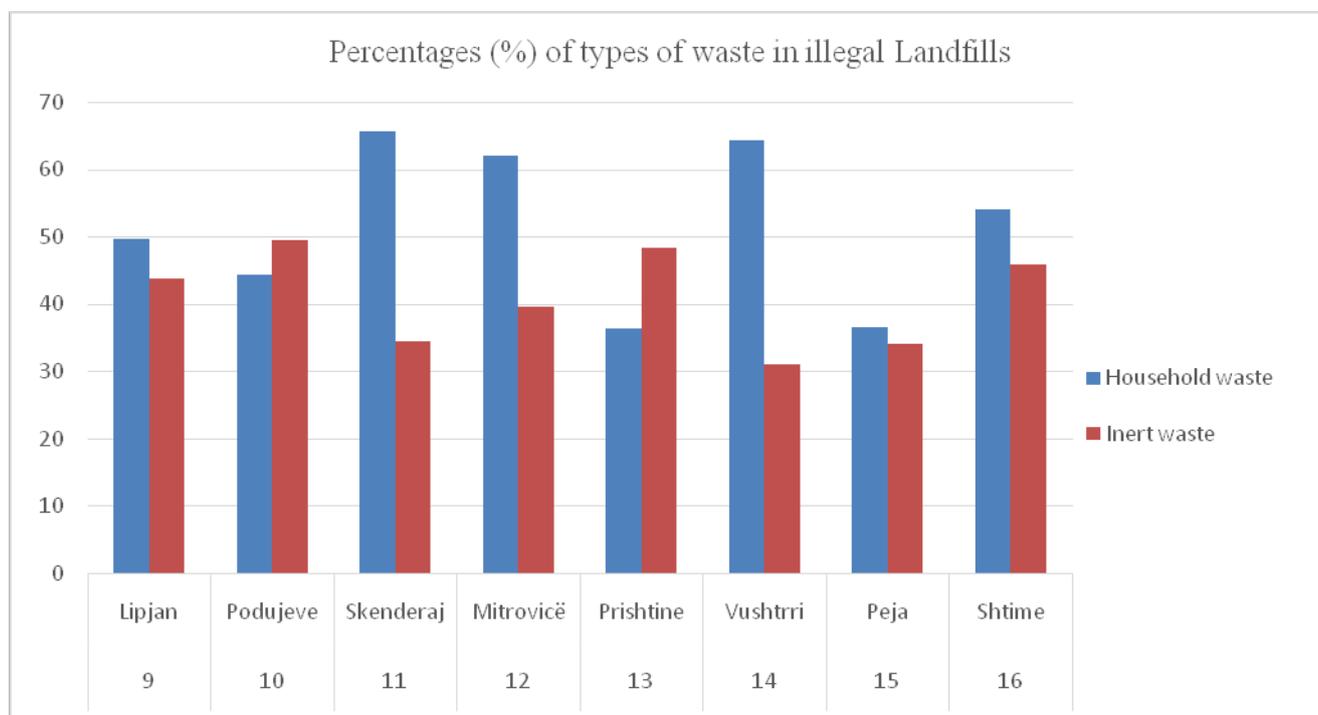


Fig. 11, Percentages of types of waste in illegal landfills

In Fig. 11, the percentage of household waste of the illegal landfills is registered as the highest with 65.6% in Skenderaj, 64.3% in Vushtrri and 62.1% in Mitrovica. Of solid waste in illegal landfills, the highest percentage is registered in Podujeva with 49.4%, in Prishtina with 48.3% and in Shtime with 45.9%.

## 5 Conclusions

The level of economic development and urban population density influences the generation of municipal waste in a country [9]. Based on the results we can conclude that a huge amount of waste does not go to the landfills, but are rather thrown away by the citizens themselves. Only half of the population in Kosovo, 90% in the cities and 20% in the villages, are covered by waste collection services. This means that some people that do not have this service are throwing away their waste. Moreover, in Kosovo no location or any landfill for construction waste exists [11].

Therefore, this leads that people and businesses do not have any place to throw these types of waste and are throwing them everywhere. The illegal dumpsite creation is a result of the lack of management system, which covers approximately 50% of the territory in Kosovo. Their treatment is complicated and expensive, as well as, difficult to achieve with the existing infrastructure. Definitely, to achieve the good results on illegal dumpsite treatment, it is very necessary to involve a collaboration of wide institutions (the government, municipalities, operators and waste management company, and technical expertise) [12]. Raising the environmental awareness is another key factor on waste management area. The integration of education for sustainable development (ESD) into all levels of education is a key priority in Kosovo's environmental action plan [13]. The re-usage of mixed limited waste, recycling and conversion options, play a huge increase on the costs and reduce on the efficiency of performances of the existing technologies for waste treatment [14].

The lack of data warehousing in tone at illegal dumpsites are an obstacle in comparing the data in this study, but the data obtained will help as a reference for research and further study(s), as for the contamination of water, soil and other environmental effects. The management of these landfills would be impossible to compile without the identifying information.

The main problem is that these landfills are still active and still lack information about the waste fragmentation. The large amount of wastedumped in illegal landfills, could be reused, whether by recycling or energy recovery, thereby generating financial, environmental, and social returns that would otherwise be lost to disposal in the sanitary landfill[15].

Therefore, we can conclude that a lot of work is still needed and a lot of future challenges will have to be overcome to achieve significant advances in waste handling, especially in the 16 municipalities, because depending on the advances obtained, this will help in minimizing the negative impact[11].

This study will enable all municipalities to activate their full potential and financial personnel for preparing management plans for the elimination of landfills. This study will enable central and local institutions and the public to have accurate information about the existence of illegal landfills, the socio-economic effects to landfills, usage of efficient funds, disposal of illegal landfills to municipalities, and it will help in preventing the expansion of other landfills.

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