NALAS

Network of Associations
of Local Authorities
of South-East Europe

REPORT

BENCHMARKING ON SOLID WASTE MANAGEMENT IN SOUTH-EAST EUROPE 2019

Contents

LIST OF CHARTS

List of tables:

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THE REPORT IN BRIEF:

The Benchmarking Report on Waste Management in South-east Europe 2019 has been prepared as a joint effort of the NALAS Task Force on Solid Waste and Water Management members form eleven Local Government Association (LGAs), utilizing data from 2018 from ten countries in the region.

Purpose of the Benchmarking Report is to follow the developments in the waste management sector in the region to show trends positive or negative, but also foster sharing of insights on the factors influencing such trends and exchanging good practices among LGAs in South-east Europe.

Among other things, the Report aims to add to the aspirations of the countries in the region, especially those not yet part of the European Union, to establish a reliable practice of waste data collection and reporting to have a better basis for policymaking.

The third Solid Waste Management (SWM) Benchmarking Report in SEE comes after a three-year interval, and unquestionably shows a positive trend in the waste management sector at the level of NALAS member countries. It also points out that the most obvious differences within the Region are between EU members and candidate countries as a consequence of the obligation of former ones to strictly apply standard set in EU policies.

Besides, this issue of the Benchmarking Report introduces the Circular Economy to promote it as a new EU paradigm and the main tool for decoupling of economic growth and pressure on the environment and natural resources as well as to improve its understanding and implementation in observed countries.

Main findings of 2019 Waste Management Benchmarking Report are as follows:

- Even though most of the participating countries have regulations that are governing waste management data collection and reporting, it can be observed that reporting systems aren't fully implemented which to some extent compromises data reliability. Furthermore, in some cases, the data is missing or given based on estimates rather than measurements. In that respect, since the last reporting cycle, data collecting practice in the region has been further supported through NALAS and GIZ implemented projects which can be observed by the reporting of pilot municipalities.
- The progress of national economies in the region is visible and is reflected in the constant growth of the gross domestic product per capita. Although economic growth usually also means an increase in output of waste, reported data on waste generation per capita between 2014 and 2018 in many countries has a varying trend. The reliability of data is more likely to be the reason for such trends rather than a change of habits of the local population. Even though GNI in SEE is only one-quarter of that in EU, average waste generation per capita in the region is 0,97 kg/day, which is less than the EU 28 average of 1,33 k/day. The 2014 GNI per capita has increased by approximately 20% in total for target countries. However, average waste production per capita is mainly keeping steady from 2014 to 2018. The reason for this observed phenomenon is not better waste management practices in the region, but more accurate data on waste quantities in recent years, unlike those from previous years given upon approximation. It can be concluded that economic development and waste production are still coupled in the target countries and that more effort should be implemented into shifting national economies towards the circular economy.
- The greatest progress in the SEE region since the last reporting period has been made in controlling waste disposal, which is visible by the decrease in the number of illegal dumpsites. However, the overall percentage for illegal dumping in the region is close to 15% of the total waste generated. At the same time landfilling remains the primary option for waste disposal with an average of approximately 79% for the region. Some efforts and progress in other waste treatment as well as recycling can be observed but is still far from EU standards and EU 28 recycling rate average for the 2017 year which is 46,4%. The thermal treatment of solid waste is only present in Romania.
- Waste composition reported by pilot municipalities shows that it still primarily consists of biodegradable waste which in the region amounts up to 55% of total waste volume. On the other hand, there is almost no recorded effort to exploit the opportunities that the implementation of biological waste treatment provides. For that matter only Romania has a significant figure of 10% of biological waste treatment, followed by Croatia with 2,2% and Turkey and Bosnia and Herzegovina will less than 1%.

•The average recycling rate for packaging waste for observed countries is 40,6% with Slovenia leading with the recycling rate of 70,1%. Still, it is lower compared to the EU28 average for recycling of packaging waste which was 67,0% in 2017. The full potential of separate waste collection, recycling of RDF is not adequately exploited in the region. Even with the current increase in trends, it will be hard to reach national and EU targets.

•For better understanding and comparison of waste recovery in the target countries, this year edition is introducing another indicator – Waste recovered by recycling in %, which is recycling rate out of all municipal waste. Most of the data for this indicator has been taken from the EUROSTAT database, while for some countries (e.g. Albania, Kosovo, B&H, North Macedonia, Moldova) which are not present in EUROSTAT, data are collected from national questionnaires. Except for Slovenia (58,9%), Bulgaria (36,0%), Croatia (25,3%), Turkey (11,5%) and Romania (11,1%), all other countries still have a long way to reaching EU 28 waste recovering by recycling of 47,0%. Albania has a significant 20% waste recovery rate, but the data is given by approximation and therefore not reliable for comparison. The population covered with waste collection services in observed countries is around 80%, with some countries reaching almost 100%. Still, there are some countries like Albania with less than70% coverage and Moldova with low as 35%. This inevitably leads to a large amount of uncollected waste and thus the generation of illegal dumpsites. National statistics are lacking in exact numbers of illegal dumps and their size. The situation is even worse for the population covered by compliant landfills where the average for the region is 57%.

•In the benchmark of pilot municipalities regarding waste production, it is reported that Dubrovnik (2,01 kg/cap/day), Bijelo Polje (1,58 kg/cap/day) and Bugojno (1,44 kg/cap/day) have the largest waste production per capita. These are the municipalities with most of their inhabitants living in the urban area except for Bugojno which has population divided equally between urban and rural areas. Even though it was assumed that there is a correlation between population living in the urban area and municipal waste generation per capita it is not the case for all municipalities.

• Only 13 out of 21 pilot municipalities have reported recycling activities. Unfortunately, only 6 out of these 13 have reported a significant recycling rate of over 20%. Dubrovnik, Kartepe and Herceg Novi are close to that of 20%, 19%, and 17% respectively. The highest recycling rates are reported in Uzunkopru 52,10%, Novi Marof 32,89% and Targoviste 30%. The region is well behind the national and EU targets except for Turkey and Serbia. However, this should also be taken with some reserve taking into consideration discrepancies in EUROSTAT database and national reports. When comparing recycling rates for pilot municipalities with their national recycling rates, the discrepancy is notable for Kosovo, where there is no recycling rate on the national level reported and on the other hand for North Macedonia and Moldova who's representing pilot municipalities do not have any recycling implemented, while it is present on national level.

•The circular economy is one of the main topics for European policymakers, especially when it comes to environmental protection, economic development, and overall social prosperity. However, the circular economy in the majority of SEE countries except for Slovenia is still a relatively new, unknown, not promoted and low priority topic. This statement can be applied to all major social groups like creators of public policies, political decision-makers, businesses, and citizens. Such an observation is even more valid at the local level of governance. In most countries of the region circular activities, if they are taken, usually are supported by various development projects.

•The material footprint is an indicator showing domestic material consumption per capita. A higher value indicates greater pressure of the economy to natural resources. It also shows the potential for waste generation in the country. Several economies in the region are above EU28 average which is 13,8 t/capita. Namely, Romania and Bulgaria are well above (21,56 and 19,60 t/capita) and Serbia, Slovenia, and Montenegro are slightly above this line. Other countries in the region are below the EU average with Moldova showing the smallest value of 7,7 t/capita. Still, when combined with the economic strength of the country presented by the GNI per capita only Slovenia and to a certain extent Croatia and Turkey have managed to decouple economic strength from material use.

1. INTRODUCTION

1. Introduction

In front of you is the 2019 issue of the Benchmarking Report on Waste Management in South-East Europe. It is the third report in the row after those from 2014 and 2015. The Report as in the previous two cases was prepared by the members of the Task Force on Solid Waste and Water Management (TF SWWM) of the Network of Associations of Local Authorities of southeast Europe (NALAS). This year's issue was expended with additional circular economy data sets but also opinion analysis on the state of framework conditions for the transition to the circular economy in the SEE countries.

Whit the preparation of this Report several goals were to be achieved. Firstly, as any benchmarking exercise, the Report aims to provide a comparative picture of the state of waste management sector both at the national and local level in countries of South-East Europe. The main idea behind this comparison is to identify particularly successful or advanced waste management segments and practices in the specific country or local authority in the region, analyze it in terms of enabling factors and preconditions and then present it as the example of good practice through NALAS bodies and other communication channels. Secondly, as the third in a series of benchmarking reports this document aims to follow the trends in waste management practice in countries of the region and monitor progress towards meeting EU standards in this field. By doing so the Report becomes a powerful tool for the NALAS member associations to advocate vis-à-vis respective central level authorities for better treatment and higher prioritization of waste management but also environmental services in general. Furthermore, the Report can provide LGAs material and arguments for policymaking but also ideas and inputs for future development projects or programs that could be supported either by EU funds, international organizations, bilateral donors or even national governments.

Finally, this document has an awareness-raising purpose in terms of promoting and communicating new trends and policies in waste management and related topics introduced by the EU. In this particular case topic of Circular Economy was introduced by extending the methodological approach with two additional indicators, one local and one national, and the survey about the basic concept and Circular Economy principles among NALAS SWWM Task Force member.

With each reporting cycle, NALAS tends to improve the quality, reliability, and consistency of the data and trends presented. To achieve that, Task Force members participating in this exercise constantly monitor the release of new official waste management data in their countries and revise data from previous reports where necessary. Such adjustments are also present in this report.

Furthermore, the Report is work in progress and just one step in NALAS long term vision to expand, improve and deepen analytical basis in waste management in South-East Europe in response to the needs of both its members and other researchers.

This report gives an overview of the present situation and data from 10 countries (EU member states, candidate and potential candidate countries) and 21 municipalities in the SEE region (Table 1). The comparison of fresh data from 2018 to that from 2014 and 2015 provided in the document gives an insight of the recent achievements and trends and shows whether the countries made progress in modernizing and upgrading their waste management systems in line with EU waste legislation primarily Directive 2008/98/EC on waste (Waste Framework Directive).

Bearing in mind that the data collection and report compilation was a collective effort, at this point NALAS wishes to emphasize the contribution of all involved parties including NALAS secretariat representatives, SWWM Task Force members as well as local self-government from SEE countries that provided data for local waste management indicators.

Table 1. SEE countries and local self-governments that participated in the 2019 benchmarking exercise

Country	Municipality	Population
Albania	Lezhe	108,178
	Durres	314,496
Bosnia and Herzegovina	Bugojno	31,470
	Cazin	66,149
	Prijedor	78,826
	Laktasi	34,862
Croatia	Novi Marof	13,246
	Dubrovnik	42,615
Kosovo[1]	Ferizaj/Urosevac	108,610
	Gjakova/Djakovica	94,556
Macedonia	Kumanovo	108,048
	Lipkovo	29,519
Moldova	Soldanesti	41,200
	Nisporeni	16,638
Montenegro	Bijelo Polje	46,051
	Herceg Novi	30,992
Romania	Târgoviște	93,068
Serbia	Niš	255,288
	Čajetina	14,745
Turkey	Kartepe	118,066
	Uzunkopru	61,485

1 "This designation is without prejudice to positions on status and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo declaration of independence."

2 APPLIED METHODOLOGY

Benchmarking is a process of measuring the performance of the specific service or a process and is a common way to establish a baseline against which service levels can be assessed over different periods. It is also a tool for comparing the achievements of different entities that either provide service or are tasked with created framework conditions for specific service provision. Finally, benchmarking can define criteria for best practices and identify improvement opportunities within specific services. In this regard, waste management benchmarking is no exception and can be done at the level of public utility companies as well as local, national or regional levels.

The national set of benchmarking indicators describes the average situation at the national level, while in practice the value of the same indicator varies from one municipality to another, within the same country. In municipalities with different economic status, population and the ratio of rural-urban space the amount and composition of waste is different. Since the local authorities are responsible for SWM, there is a legitimate reason to establish benchmarking at the local municipal level, as well. The local authorities often face limited funds for the development of SWM municipal infrastructure, while local SWM public utilities are faced with reduced income from the provision of services. The benchmarking at the municipal level will provide information for decision-making on priorities for the limited funds available for service improvements, and monitor changes over time.

Besides, national benchmarking indicators show baseline situation at the national level and allow regional comparison and measuring achievements of the country towards the set of international targets, such are EU targets on SWM, as those set out in the Directive 2008/98/EC on waste (Waste Framework Directive).

The Directive includes two new recycling and recovery targets to be achieved by 2020:

- 50% preparing for re-use and recycling of certain waste materials from households and other origins similar to households, and
- 70% preparing for re-use, recycling and another recovery of construction and demolition waste.

Implementation of environmental policies, especially waste policies, is one of the European Commission's key priorities. The EU's Waste Directives are binding targets for the EU member states and the countries on the way to EU accession in the region of SEE.

One of the more recent EU policies closely related to waste management strategic framework is the Circular Economy Action Plan adopted by the European Commission in 2015. It aims to support and give a new boost to job creation, growth and investment and to develop a carbon-neutral, resource-efficient and competitive economy. The concept of circular economy was in use in the EU even before that period and since 2012 is showing significant improvements in employment. On the other hand, this approach is fairly new in South-east Europe although it was and is promoted through various development projects. Catching pace and reaching EU standards in this area is going to be an additional challenge for countries and local authorities in the SEE region.

In the direction of the mutual understanding of the concept of a circular economy, it is important to specify the definition used by the European Commission and European Environment Agency:

EC: The circular economy is an economy "where the value of products, materials, and resources is maintained in the economy for as long as possible, and the generation of waste minimized". The transition to a more circular economy would make "an essential contribution to the EU's efforts to develop a sustainable, low-carbon, resource-efficient and competitive economy".

EEA: Circular economy "refers mainly to physical and material resource aspects of the economy – it focuses on recycling, limiting and re-using the physical inputs to the economy, and using waste as a resource leading to reduced primary resource consumption".

Definitions of Circular Economy described by other relevant agencies are provided within the Annex 6.

First Solid Waste Management benchmarking exercise was performed by NALAS in 2015 resulting in Report—Benchmarking on Solid Waste Management in South-east Europe, by including data from 2014. The second report in 2016 displayed data from the participating countries for 2015 comparing it to the 2014 baseline.

2.1 The aim of the Benchmarking on Solid Waste Management in SEE

Main objective of NALAS Waste Management Benchmarking is to continue with research exercise to identify and analyze a variety of quantitative and qualitative waste management indicators in SEE continues consistently, covering all aspects of solid waste management system like waste generation, household-level

coverage, extent of municipal solid waste recovered/recycled, efficiency concerning landfill targets and cost recovery but also certain aspects of circular economy.

The goal of benchmarking is to capture and present WM performance at the national and the local level as well as to perform comparison and monitoring of the developments over time and regions and providing insight to what level circular economy principles are integrated into SEE region.

Moreover, taking into account existing indicators and the national statistics frameworks, NALAS intended to develop easy and user-friendly waste management indicators, which would be used for a comprehensive comparative assessment of the SWM in the countries and municipalities in the region of SEE. This original approach is still very much in NALAS focus and is reflected also in an improved and broadened set of indicators that were used for the 2019 report.

The main goal of the Waste Management Benchmarking is to support NALAS members— local government associations in the countries of SEE region— to gain an independent perspective about how well the WM is performed, compared to other countries and municipalities. It points out specific possibilities, prioritizes improvement opportunities, set performance expectations and monitor change at the level of SEE region. Ultimately it is about managing solid waste in a socially, environmentally and financially responsible manner.

Establishment of the Benchmarking on Solid Waste Management in SEE provides national and local policymakers, researchers, and interested external observers with reliable comparative data on municipal solid waste management in the Southeast Europe region.

2.2 Scope of the Benchmarking

The scope of the Benchmarking was focused on:

- Assessment of the degree to which laws and/or other legal instruments are in place and implemented at the national or local level which enables WM benchmarking;
- Documenting improvements in SW legal framework in countries of the region;
- Obtaining reliable data on WM performance at the national and local level in the SEE region;
- Providing quantitative and qualitative indicators at the national and local level showing countries and municipal WM performance and produce a comparative analysis of the current state of affairs in the SEE region;
- Point out cases where indicators and trends are positive and highlight those examples as good practice on both national and local level;
- Assessment of circular economy in the region of SEE, particularly through indicators covering sustainable resource management;
- Opinion analysis of the NALAS member associations' representatives on awareness, enabling factors and barriers for the circular economy in the region.

The research was carried out with active participation and support provided by the NALAS Task Force members and Knowledge Managers from Local Government Associations. The Task Force members collected and check the quality and reliability of data from the national and the local level necessary for the calculation of indicators and forwarded them to the regional expert for overall check and compilation.

2.3 Research sample

It was envisaged that the research of the status of solid waste management in SEE was to be conducted in as many countries in the region as possible (preferably all 12 countries covered by NALAS). Still, as a minimum aim was to at least keep the same number and composition of the sample as in previous researches. The following countries were addressed through this research exercise: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo*, Moldova, Montenegro, North Macedonia, Romania,

Serbia, Slovenia, and Turkey.

The Benchmarking on SWM and its report is focused on the lowest level of sub-sovereign government, meaning democratically elected municipal or communal governments.

In that respect, two municipalities from each country with the population in the range of approximately between 25.000 and 150.000 inhabitants were to be proposed and selected as a research sample for the benchmarking study. One of the selected municipalities should have a population predominantly living in urban while the other should have a population predominantly living in rural areas. In that respect, service coverage, waste generation, and treatment are analyzed taking into account different municipal contexts (urban and rural). Since the sample should represent typical cases on opposite sides of urban/rural spectra on the country level additional criteria were proposed to be considered like income per capita at the municipal level, seasonality in waste quantity or alike. Capital cities were intentionally excluded from the sample. The purpose of adding additional criteria was to obtain an average, which would represent the best particular country. The task of selecting sample municipalities relied on each Local Government Association and the respective local expert. The benchmarking also compared aggregate/national data about the municipal solid waste management across the SEE countries.

Municipal waste management plans, Waste Atlas (http://www.atlas.d-waste.com/), as well as other official documents produced by the public utility companies and local and national authorities, served as the source of information for benchmarking.

To be able to follow WM trends throughout longer periods at both national and local level it was recommended that the samples local authorities should stay the same as in previous reports. This approach was not mandatory especially in cases where previously researched municipalities were reluctant to give their consent for various political or other reasons.

2.4 Research methods

To allow benchmarking of service performance, regional comparison and monitoring developments over time, a set of indicators for integrated sustainable waste management (ISWM) at the national and the local level were identified[2].

Indicators can have significant implications on policy and strategic orientation at the local and national level, therefore they have to be selected or defined with thorough consideration. The approach taken for this exercise includes identifying a set of indicators that can describe the level to which countries and municipalities in SEE are close to integrated sustainable waste management practice but also to what extent economies in this region have circular character.

The selected indicators combine waste data (quantity and composition) and service provision level (collection, treatment, disposal, and recycling), which allows comparison at the regional level but also includes several indicators from circular economy area especially those that covering sustainable resource management.

NALAS SWM benchmarking exercise was performed first in 2015 (with data from 2014) and then again 2016 (with data from 2015). Since no significant changes in indictor trends could be observed between two exercises and due to the required time and effort local association representatives needed to put into obtaining necessary data it was recommended by the members of the TF that the benchmarking research is to be conducted in intervals of three years and that the data used should be only from the last year of that period.

2 In the process of identification of the indicators, following references were taken into consideration: D. Willson at all/ Benchmark Indicators for Integrated & Sustainable Waste Management (ISWM), UNEP Integrated SWM Scorebord, FOFAS/ Benchmarking Analyses and Policy Priorities in Ireland, BALKWASTE/Study regarding development of the Indicators, EASAC policy report 30/Indicators for Circular Economy

Research aspect	Research Method
Assesses the degree to which laws and/or other legal instruments are in place and implemented at national or municipal level which enables SWM benchmarking	**Questionnaire on Institutional and Legal Framework on WM (Annex 1)** The Questionnaire is focused, but not limited to: - institutional responsibilities for WM and data collection and reporting on WM indicators, - legal framework that regulates WM, - data collection and reporting at national and EU level (reporting to EEA).
Benchmark selected municipality's performance and do the comparative analysis of the current status of the municipal solid waste management	**Questionnaire on WM Indicators (Annex 2 and Annex 3)** Considering the levels of research—local and national level, this Questionnaire includes two categories of indicators: Local and National Level indicators. For each indicator the following specifications are defined: name of the indicator, unit, definition, and rationale for the indicator, data required for calculating the indicator and measurement methods.
Assessment to what extent economies in the region of SEE have circular character	**Questionnaire on Circular Economy (Annex 4)** With the questionnaire, the aspects of circular economy in the region of SEE are explored, as well as, the insight to what level circular economy principles are integrated in SEE region.

Table 2. Overview of research methods

2.5 SWM Indicators

Appropriate benchmark indicators should allow LGAs and their members to judge performance in terms of delivering solid waste management services and provide information for deciding what should be the priority focus for service improvements, and also for monitoring changes over time. It is also important to have consistent indicators that allow the performance of the SWM systems to be compared through a single set of indicators, useful for comparing among SEE countries and with EU member states. The SWM Indicators are divided into two categories including both, national and the local level.

National level indicators	Local level indicators
Indicator no.1: Total population Indicator no.2: Country income level Indicator no.3: MSW generation per capita (kg per year) Indicator no.4: Waste treatment indicator Indicator no.5: Recycling rate Indicator no 6: Land disposal sites for solid waste Indicator no.7: Solid waste collection service coverage Indicator no.8: Share of population covered by compliant landfills Indicator no.9: Material footprint Indicator no.10: Circularity Index	Indicator no.1: Population number Indicator no.2: Urban/rural ratio Indicator no.3: Population at urban area Indicator no.4: Population at rural area Indicator no.5: MSW generation per capita Indicator no.6: Waste composition Indicator no.7: Population covered by MSW collection service (%) Indicator no.8: Population covered by MSW collection service in urban area Indicator no.9: Population covered by MSW collection service in rural area (%) Indicator no.10: Population covered by packaging waste collection service (%) Indicator no.11: Recycling rate Indicator no.12. Waste Management fee Indicator no.13. SWM Informal Sector Indicator no.14: Land disposal sites for solid waste Indicator no. 15: Linear Flow Index

Table 3. List of SWM indicators at the local and national level

The indicators that are analyzed and compared at the regional level meet the following criteria:

- The indicators are associated with a clear concept and must be unambiguous;
- •They are independent among themselves, to avoid criteria overlapping;
- The indicators are verifiable and calculated through simple mathematical processes;
- The indicators will support standardized measurements that will be annually reported;
- Quantitative indicators, (if possible) should be supplemented by a qualitative indicator.

For each indicator the following Indicator Specification is defined: Name of the Indicator, Unit, Definition, and Rationale for the indicator, Data required for calculating the indicator, measurement methods. The data sources such as municipality, public utility company (PUC), line ministers and state statistical offices of the countries in SEE, Eurostat, European Environment Agency, ISWA – the International Solid Waste Association, etc. are identified and described.

In particular, as many of the criteria which make up the qualitative indicators are subjective, a clear Guidance to the "assessors" – the Task Force's members are provided. The regional expert provides an "independent arbitration" by checking that individual assessors have consistently interpreted the available information. It is also important that a summary of the indicators is available, in an attractive and easy-to-interpret format for presentation to local and national decision-makers and international agencies that might have an interest in it.

The NALAS Task Force on Solid Waste and Water Management members support the research by the provision of technical assistance, sharing experiences and initiatives for better realization of the process. Thus, the task force's members are considered as a core team of local experts actively involved in the establishment and implementation of the Benchmarking on Waste Management in SEE.

2.6 Key challenges in applying the Benchmarking methodology

Implementation of environmental policies, especially waste policies, is one of the European Commission's key priorities. The EU's Waste Directives set binding targets for the EU member states and are guiding principles for the countries on the way to EU accession in the region of SEE.

On the other side, the countries in the region of southeast Europe have limited experience in Waste Management benchmarking. There are some data available at the national level as part of national statistics or as part of reporting on the state on the environment. The system of data collection or processing of indicators is not well established especially in some countries of the region. The obligation to prepare baseline situation on WM according to the indicators is often not legally binding.

Also, there are still differences in municipal waste management performance between the countries in the region. Municipal waste data may vary on the municipal and national levels, depending on the established local waste management systems. Therefore, existing waste data in the region should be considered with a degree of caution due to inconsistencies in definitions, data collection methodologies, and quality of inputs that can vary depending on the institutional capacity of the entity providing it. Furthermore, it is not unusual to encounter interruptions in data sets, missing data for different periods or lack of data and data acquiring procedures on both local and national levels.

Ensuring the quality of the household waste data is challenging for the utilities providing the services and for the municipalities tasked with creating conditions and organizing the provision of the service as well as for supervisory and other national authorities in charge of designing policies and following up their implementation at the national level. The municipal utilities providing solid waste collection and treatment services in SEE often do not have accurate and reliable data on the quantity and composition of household waste. This prevents them from reporting properly to municipalities and national-level authorities. It hinders also making publicly available transparent information upon their services. The poor quality of available information subsequently precludes local authorities to assess precise needs in terms of investments and leave them in the position to make important decisions on estimations rather than on evidence. It leads to insufficient effectiveness and efficiency in the delivery of services, poor planning, and monitoring and impedes the actual implementation of European Union standards and targets set by European Waste Management Directives.

Benchmark indicators rely on acquiring valid information on the state of the waste management system. This immediately relates to one of the main potential challenges of the availability and reliability of the necessary information. Depending on national waste management and waste data collection systems, the approaches established in the countries of SEE for municipal waste data collection vary to a large extent, thus hampering data comparability across countries.

A major principle in developing the benchmark indicators has to be that they should reflect also the 'soft', governance aspects. Without adequate attention to it, any attempt to introduce sustainable changes and modernize waste management systems are likely to fail. Difficult to measure, these indicators are also considered as a potential risk.

Development of a set of criteria that can be applied equally to both, EU members and the rest of the countries of the SEE region which are in an early stage of WM Process modernization is considered as an additional challenge.

3. COUNTRY REVIEWS

3.1 Albania

3.1.1 Waste management framework

The legal framework in Albania consists of laws adopted by the Parliament, decisions of the Council of Ministers and other regulations. Waste management in Albania is regulated by following laws and decisions:

- Law on Integrated Waste Management, no. 10463/2011
- Law on Local Self-government, no. 139/2015
- Law on Environmental Protection, no. 10431/2011
- Law on Environmental Permitting
- The decision of the Council of Ministers on defining the state responsibility of the Ministry of Truism and Environment, no. 509/2017
- The decision of the Council of Ministers on Integrated Waste Management Costs
- The decision of the Council of Ministers on Adoption of Rules, for Keeping, Updating and Publishing Waste Statistics
- The decision of the Council of Ministers on Separate Collection of Waste at Source
- The decision of the Council of Ministers on Landfills
- The decision of the Council of Ministers on Waste Incineration
- The decision of the Council of Ministers no. on definitions and rules for the organization and functioning of the national agency and regional environmental agencies, 47/2014

Waste management in Albania as in other Western Balkan countries is dominated by the EU approximation process in terms of strategic direction i.e. legal framework adjustments, waste management targets, and standards. Country policy in waste management is defined by the National Waste Strategy 2010-2025 and National Waste Management Plan 2010-2025. These documents are currently under revision. Other important strategic documents are the National Strategy for Development and Integration and Draft Cross-Cutting Environmental Strategy.

The waste management system in Albania is decentralized and the jurisdiction is split between central, regional and local authorities. Law on Integrated Waste Management tasks ministry in charge for the environment (currently Ministry of Tourism and Environment) with the responsibility for drafting waste management legislation and strategic documents while the Decision of the Council of Ministers elaborates further responsibilities of the Ministry in the field of waste management. Regional councils as mid-tier of governance are tasked with providing regional policy framework by developing regional waste management plans. Finally, Law on Local Self-government gives authority over waste management to the local government units as the original jurisdiction and tasks them with the organization and providing enabling conditions for the service provision.

Inspection in waste management is also split between the Ministry of Tourism and Environment and the local self-government. When it comes to data collection municipalities are reporting to the Ministry of Tourism and Environment and National Environmental Agency. The Agency is compiling data but also performing environmental monitoring and finally reporting to the European Environmental Agency.

Albania has three sanitary regional landfills:

- Tirana, Sharra, (GPS coordinates – Latitude 41°17'N, longitude 19°45'E)
- Bushat, Shkodra, (GPS coordinates – Latitude 42°4'N, Longitude 19°31'E)
- Saranda, Bajkaj, (GPS coordinates – Latitude 39°57'N, Longitude 20°1'E)

The remaining municipalities are disposing of waste at 80 non-compliant municipal landfills. The country reported the existence of 11 illegal dumpsites, even though this number is probably much higher and hard to estimate.

There are no landfills for inert waste. However, as a result of the implementation of the DCM no. 575 of 24.06.2015 "on the adoption of the requirements for management of inert waste", the country has shown interest in regulating this issue. There are three reported current or future waste incineration sites. According to the EEA,3 there is an incinerator near Elbasan and plans to build one close to the Sharra landfill.

3.1.2 Recent achievements

Since the last reporting period, there was a reorganization of the governmental structure at the central level meaning that jurisdiction over the waste management is now with Ministry for Tourism and Environment unlike the previous period when it was in the Ministry of Environment, Forestry and Water Administration.

3 Country fact sheet, Municipal Waste Management, Albania 2018, EEA, European Topic Center on Waste and Materials in Green Economy

Strategic documents i.e. National Waste Management Strategy and the Waste Management Plan are currently under revision. Environmental protection and integrated urban solid waste management are the primary objectives of the municipalities. Service coverage has increased and steps for the formal introduction of recycling have been taken. The development of tourism and the green economy are important potentials for improving the living standards of citizens. Projects dealing with the promotion of circular economy are being implemented.

3.1.3 Assessment of progress

Albania is showing obvious progress in some areas especially when it comes to the ratio between waste disposed to sanitary and non-sanitary landfills. The percentage has shifted significantly towards sanitary landfills and is now 60%. Waste recovery by recycling has also increased from 15 to 20%. There is still no biological treatment and waste incineration facilities in operation although several are planned. According to the data provided by the Association of Albanian Municipalities (AAM) recycling rate is around 12%. The population covered by organized waste management service is 67%. Half of the Albanian population is covered by sanitary landfills.

3.1.4 Circular Economy

The circular economy is a new term in the Albanian context. It cannot be found in the legal framework yet, but it will most likely be introduced with the revision of the Integrated Waste Management Strategy and the Plan. Some progress is being made with the intervention of international and bilateral development programs like GIZ project "Climate-friendly Integrated Solid Waste Management and Circular Economy in Albania".

According to AAM, Circular Economy is and will be mainstreamed in sectors of packaging waste, electrical and electronic waste and shared economy. Key drivers for transition to the circular economy are EU standards and policies and country regulation. Key stakeholders for the circular economy in Albania will be central and local government institutions and citizens. Private and public companies should follow. Legal, economic and financial shortcomings are recognized as the biggest barrier for the introduction of the circular economy. When it comes to awareness of different groups of actors, big companies have the best insight into the circular economy, decision-makers at the central and local level SMEs and PUCs are following. Regarding support to the circular economy, there are some initiatives but not enough is being done. As a good example, the Municipality of Himar with the support of GIZ is introducing a plastic recycle sustainable system.

No.	Indicator	Unit	Albania 2014	Albania 2015	Albania 2018	Source of data
1	Total population	Number	2,893,005	2,892,303	2,866,380	http://www.instat.gov.al/ https://data.worldbank.org/indicator/sp.pop.totl
2	Country income level (GNI)	$	4,440	4,280	4,860	http://data.worldbank.org/
3	MSW generation per capita	kg/cap/ day	0.6	0.6	0.6	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
4a	MSW landfilled	%	30	40	60	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
4b	MSW in illegal open dumps	%	60	50	20	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
4c	Waste recovered by recycling	%	10	15	20	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
4d	MSW biological treatment	%	0	0	0	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics

No.	Indicator	Unit	Albania 2014	Albania 2015	Albania 2018	Source of data
4f	MSW treated in thermal plants	%	0	0	0	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
5	Recycling rate	%	33	10	12	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
6a	Sanitary regional landfills	Number	N/A	3	3	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
6b	Non-compliant municipal landfills	Number	N/A	89	80	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
6c	Illegal dumpsites	Number	N/A	13	11	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
6d	Landfills for inert waste	Number	N/A	0	0	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
7	Population covered by MSW collection service	%			67,7	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
8	Population covered by compliant landfills	%			50	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics
9	Material footprint	Number		31	37	NALAS TF questionnaire, National Strategy on SWM, Albanian Agency for Statistics

Table 4. Waste management indicators for Albania (2014 – 2018)

3.2 Bosnia and Herzegovina

3.2.1 Waste management framework

Development and implementation of the waste management policy in Bosnia and Herzegovina is at the entity level i.e. Federation of Bosnia and Herzegovina (FB&H) and Republic of Srpska (RS) and level of Brčko District (BD). The provision of the waste management service is in the jurisdiction of municipalities in RS as well as in FB&H. Federation B&H is divided into 10 Cantons and in Sarajevo Canton, municipal waste management is the responsibility of the Canton. The waste management company is owned by the Canton of Sarajevo and serves 9 municipalities.

Solid waste management regulation in Bosnia and Herzegovina consists of:

- Law on Waste Management in the Republic of Srpska *(Official Gazette (O.G.) RS 113/13 and 106/15)*
- Law on Waste Management in the Federation of B&H *(O.G. FB&H 33/03, 72/09, 92/17)*
- Law on Waste Management in BD *(O.G. BD 72/09, 25/04, 1/05, 19/07, 2/08 and 9/09).*
- **Responsible institutions at the entity level are:**
- Ministry of Environment and Tourism of the Federation of B&H (FB&H),
- Ministry of Spatial Planning, Construction, and Ecology of the Republic of Srpska (RS)
- Department for Physical Planning and Proprietary Affairs of the Government of Brčko District (BD).

Amendments to the Law on Waste Management of Federation of B&H were adopted in 2017 (Official Gazette of FB&H, no. 92/17), obligating the Federation B&H Fund for Environmental Protection to establish and maintain waste management information system. Based on the Law, the Decree on the Waste Management Information System (Official Gazette of FB&H, no. 97/18) was adopted in 2018. The main purpose of the Decree is to create a legal basis for collecting data on waste and products that at the end of life cycle become special waste categories. The goal of establishing a waste management information system at the level of the Federation of B&H is to create a web platform maintained by the Fund that will enable simplified electronic reporting, data collection, and verification, as well as data processing. The data collected will be the basis for the preparation of planning and implementation documents in the field of waste management. The information system is based on 4 modules:

1. **Information system for the management of special categories of waste**
2. **Information system for the management of municipal waste**
3. **Information system for the management of non-hazardous production waste**
4. **Information system for the management of hazardous waste.**

The following subjects are required to submit reports according to the Decree:

- Waste collectors including PUCs, recyclers, waste importers and exporters, landfills, operators of waste treatment facilities, etc.
- Producers, importers, and distributors of products which become special waste categories after use
- Generators of production waste
- System operators
- The obliged industry, regardless of whether they transferred their waste management obligations to system operators.

Fund for Environment of the Republic of Srpska is collecting data from municipalities, public and private communal enterprises, and landfill sites. This includes data on waste generation and types of waste. This data is used to understand the situation concerning waste management.

For statistical purposes, entity agencies for statistics collect data on waste collected and disposed of. This data is conveyed to the National Agency for Statistics of B&H, which compiles data and reports to EUROSTAT. At FB&H level, the Decree on the Waste Management Information System has defined the obligation of the Federal Ministry of Environment and Tourism to "contribute to the quality of reports sent to EUROSTAT, EEA and EIONET by ensuring communication and data exchange with national-level institutions". The Agency for Statistics B&H still represents the national reference center for reporting on waste management statistics and harmful substances toward the Statistical Office of EU (EUROSTAT) and European Environment Information and

Observation Network (EIONET).

Inspection is performed at several administrative levels in FB&H, RS, and BD. Currently, inspection is under the jurisdiction of the following bodies:

- Federal Directorate for Inspection Affairs and Cantonal Directorates for Inspection Affairs in the FB&H. With the amendments to the Law on Waste Management in FB&H in addition to environmental inspectors, the responsibility for inspection and control of implementation of the Law has also been given to market, tourism and catering inspectors at the Federal and Cantonal level.
- Administration for Inspection Activities in the Republic of Srpska and at the local level the municipal communal police
- Inspection is performed at the District level by the Inspection Department in BD.

Although waste management system in B&H still faces some problems regarding waste collection and treatment number of sanitary landfill sites has grown to 7 since the last reporting period:

- "Smiljevići", Sarajevo; (GPS: latitude 43o21'N and longitude 18o21'E)
- "Ramići", Banja Luka; (GPS: latitude 44o86'N and longitude 17o15'E)
- "Brijesnica", Bijeljina; (GPS: latitude 44o45'N and longitude 19o10'E)
- "Mošćanica", Zenica; (GPS: latitude 44o10'N and longitude 18o00'E)
- "Uborak", Mostar; (GPS: latitude 43o38'N and longitude 17o88'E)
- "Crni vrh", Zvornik; (GPS: latitude 44o 23' 55" and longitude 19o 00' 32)
- „Korićina", Livno; (GPS latitude 43o57' and longitude 16o55)

As a direct result of the increased number and better coverage of the population by sanitary landfills estimated number of non-compliant municipal landfills has decreased to 84. There is only one landfill for inert waste located in the Municipality of Neum. The number of illegal dumpsites has increased. The current estimation of the number of illegal dumpsites in both FB&H and RS is 834. Still, it is believed that this number is even higher.

3.2.2 Recent achievements

Recent achievements in FB&H regarding waste management can be summarized as:

- From the legislation aspect, the recent achievements in municipal solid waste management in FB&H relate to the adoption of the amendments to the Law on Waste Management in 2017. The key changes refer to the obligation for establishing and maintaining a waste management information system at the FB&H level. Based on this Law, a by-law to specify the details of the information system was adopted in 2018 (Decree on the Waste Management Information System).
- Landfilling is still the predominant method for dealing with waste in B&H. The number of sanitary regional landfills in the country has increased to 7 (compared to 6 in 2015), serving a total of 44 municipalities. The number of non-compliant municipal landfills has decreased (from 93 in 2015 to 76 in 2018). However, there is still a vast number of illegal dumpsites.
- At the national level, data collection on MSW remains poor and is often based on estimates. There are no reliable data on the quantity of recyclable waste separately collected, recycled.
- Observing the Solid Waste Management System of the Republic of Srpska between the two reporting periods, it can be concluded that this system is under continual development. The progress can be recognized in different areas, such as:
- From the legislation aspect, the recent achievements related to the adoption of the amendments to the Law on Waste Management and the adoption of Decree on packaging waste management, both in 2018.
- From the strategic aspect, adoption of the Waste Management Strategy of RS for the period 2017-2026 and preparation of the Waste Management Plan of RS, which is yet to be adopted,
- Construction of new regional sanitary landfill in Zvornik and further development of existing regional landfills employing more advanced sanitary landfilling,
- Establishing the system operator for packaging waste EUROBETA and further development of the system for

management of packaging waste, etc.

3.2.3 Assessment of progress

Recent data shows that there is an increase in waste generation per capita, from 0.89 to 0,97 kg/per capita. The recycling rate remains low and well below the set targets, which are 30% recycling rate in the Federation of Bosnia and Herzegovina by 2018 (set by the Strategy for Environmental Protection of the Federation of Bosnia and Herzegovina 2008-2018) and 23% in the Republic of Srpska by 2026 (Solid Waste Management Strategy of the Republic of Srpska 2016-2026). Landfilling is still the preferred option where 75,6% of waste is disposed of at sanitary or non-compliant municipal landfills. This increase can be attributed to two additional sanitary landfills that are in operation since the last report. Only a small fraction of the total waste generated in the country is treated in MBT plants in the City of Mostar and the Municipality of Konjic. Disposal of waste at illegal dumpsites remains an issue since an increase in illegal dumpsites has been documented.

3.2.4 Circular Economy

In Federation B&H and District of Brčko circular economy principles have not yet been introduced in the waste management framework. At both the national and the local level, the linear model of the economy is more dominant than the circular model. The introduction of extended producer responsibility systems for packaging and packaging waste in FB&H and RS and WEEE in FB&H is important to be mentioned as a first step in the transition to the circular economy in this country. The existing strategies in the waste sector in FB&H, RS, and BD contain quantitative targets that refer to an increase in recycling and reuse for special waste categories, as well as on the reduction of the amount of waste for final disposal with more efficient resource use. At the institutional level, the same governmental bodies as for waste management should be responsible for the circular economy.

Necessity of introduction of circular economy is recognized and will be adopted in near future through a National Plan on Waste Management of the Republic of Srpska, aiming to achieve rational use and conservation of natural resources, reduce of the total amount of waste to be landfilled, reduce of emissions and reduce of human health and environmental hazards, through:

- Prevention of construction and demolition waste, packaging waste, different streams of waste (EE, tires, plastic bags, etc.)
- Development of food waste management, home-composting, “green” public procurement, public awareness,
- Promotion of sustainable civil construction, eco-design, preservation of the environment.
- In FB&H and RS few financial mechanisms are supporting the transition towards the circular economy. Among these mechanisms are fees paid for the non-achievement of recycling and recovery targets for some special categories of waste:
- in FB&H and RS, fees for non-achievement of recycling and recovery targets for packaging waste— In case of not transferring the obligations to a licensed System Operator, the obliged importers, fillers, packers, distributors and end—suppliers are obliged to pay fees for loading the environment with packaging waste to the respective entity Fund. These fees practically present a penalty for not achievement of general and material-specific recovery and recycling targets for packaging waste. The fee is determined according to the type, quantity, composition, and purpose of the packaging, the material from which the packaging was made, as well as about the national goals (recycling and recovery targets).
- in FB&H fees for non-achievement of recycling and recovery targets for WEEE— Producers, and importers of EEE who have not transferred their obligations to a licensed System Operator are obliged, along with the general fee, to pay a fee for the management of WEEE to the Fund for Environmental Protection of FB&H. Fees are specifically spent on the management of electrical and electronic waste.

The promotion of circular economy in Bosnia and Herzegovina is implemented through project-based activities. An example is the SCP/RAC project supported through the Cooperation Agreement between UN Environment and IMELS (Italian Ministry of Environment Land and Sea) and EBRD (European Bank for Construction and Development), which has recently started a series of activities aiming at improving the policy framework and engaging with the food & beverage industry in Albania, Bosnia and Herzegovina and Montenegro for tackling plastics packaging value chains in a circular economy. The objective is to contribute

No.	Indicator	Unit	B&H 2014	B&H 2015	B&H 2018	Data source
1	Total population	Number	3,827,343	3,531,159	3,531,159	Census of Population, Households and Dwellings in Bosnia and Herzegovina, 2013, Results. Agency for Statistics of Bosnia and Herzegovina, First release, Public transportation and disposal of municipal waste, 13 Sept 2018
2	Country income level (GNI)	$	4,820	4,670	5,690	http://data.worldbank.org/
3	MSW generation per capita	kg per day	0.95	0.89	0.97	NALAS TF questionnaire, Agency for Statistics of Bosnia and Herzegovina, First release, Public transportation and disposal of municipal waste, 13 Sept 2018
4a	MSW landfilled	%	75	76.44	75.6	NALAS TF questionnaire, Agency for statistics of Bosnia and Herzegovina, First release, Public transportation and disposal of municipal waste, 13 Sept 2018.
4b	MSW in illegal open dumps	%	24.6	23.5	23.9	NALAS TF questionnaire, Agency for Statistics of Bosnia and Herzegovina, First release, Public transportation and disposal of municipal waste, 13 Sept 2018
4c	Waste recovered by recycling	%	0.28	0.28	0.29	NALAS TF questionnaire, Agency for Statistics of Bosnia and Herzegovina, First release, Public transportation and disposal of municipal waste, 13 Sept 2018
4d	MSW biological treatment	%	0,28	0,98	0,10	
4f	MSW treated in thermal plants	%			0	
5	Recycling rate	%	14	10	7	NALAS TF questionnaire
6a	Sanitary regional landfills	Number		6	7	NALAS TF questionnaire, State of the Environment Report for B&H (2019), final draft
6b	Non-compliant municipal landfills	Number		93	84	NALAS TF questionnaire, State of the Environment Report for B&H (2019), final draft
6c	Illegal dumpsites	Number		Approx. 590	Approx. 834	NALAS TF questionnaire, State of the Environment Report for B&H (2019), final draft
6d	Landfill for inert waste	Number		1	1	NALAS TF questionnaire, State of the Environment Report for B&H (2019), final draft
7	Population covered by MSW collection service	%			77.02	NALAS TF questionnaire
8	Population covered by compliant landfills	%			47	NALAS TF questionnaire
9	Material footprint	Number			11.5	

Table 5. Waste management indicators for Bosnia and Herzegovina (2014 – 2018)

to the prioritization and adoption of preventive measures that tackle plastic packaging in the food and beverage industry, by improving the relevant policy framework, strengthening the engagement of businesses and business support organizations (BSOs) and building other relevant stakeholders' capacities.

3.3 Croatia

3.3.1 Waste management framework

The Ministry of Environmental Protection and Energy is a central body responsible for the preparation of waste management legislation, national waste management strategy and waste management plan, as well as coordination of co-operation among all involved institutions in waste management in Croatia.

The main legal acts on the national level are the Law on Sustainable Waste Management (Official Gazette No. 94/13, 73/17, 14/19, 98/19) and Environmental Law (Official Gazette No. 80/13, 153/13, 78/15, 12/18, 118/18). Based on the Law Croatian Government adopted the Waste Management Plan for the period 2017-22 (Official Gazette No. 3/17). According to the Law town and municipality is obliged to prepare a waste management plan for 6 years period.

Municipalities and cities prepare and adopt waste management plans, implement measures of municipal waste management, and with coordination from the county, ensure the implementation of prescribed measures.

The control over the implementation of the legal regulations and prevention of uncontrolled environmental pollution, including Law on Waste Management, is conducted by the Environmental Inspection at the regional and national level and is under the jurisdiction of the Ministry of Environmental Protection and Energy.

The Croatian Environment and Nature Agency (HAOP) is a public institution responsible for the collection and consolidation of waste data, developing and maintaining the Waste Management Information System, enabling and facilitating access to information on waste to decision-makers and the general public, developing reports on the status of the waste sector. The agency reports to the European Environmental Agency and Eurostat.

Croatian Environmental Protection and Energy Efficiency Fund (CEPEEF) is a state non-budget fund, established to ensure additional resources for financing projects, programs and similar undertakings in the field of preservation, sustainable use, protection and improvement of the environment.

Division of the responsibilities among different tires of governance in waste management is as follows:

- Local authorities – collection, transport, and treatment
- Regional administration – planning and inspection
- National authorities – strategic planning, creation of the legal framework and inspection

Municipal waste management in Croatia is shifting from decentralized disposal of non-treated waste on numerous local sub-standard landfills within counties to centralized waste management and Waste Management Centers serving the needs of one county or, in some cases, of several counties. The WMC concept has been adopted by the Croatian Government in its National Waste Management Plan. During 2017 a total of 130 waste landfills were active. The current number of non-compliant municipal landfills is 99 with only two sanitary landfills. There was no report on open dumpsites nor inert waste landfill. Production of waste is 0,83 kg per capita and the service coverage is very high (99%) to reach 100% in the coming period.

3.3.2 Recent achievements

In the recent period, Croatia has adopted changes to the Law on Integrated Waste Management which introduced new targets for the maximum amount of bio-degradable waste that can be landfilled. Croatia also adopted a new Waste Management Plan.

3.3.3 Assessment of progress

National goals are not realized as planned because of a few main reasons:

1. A large number of small local municipal utility companies are not financially capable, and they do not have enough workers to reach the goals.
2. National tenders for financing waste collection equipment from EU funds are not aligned with the priorities in the system - vehicles, containers, and construction of recycling yards were first funded, and waste sorters and composters were left last. That is problematic because of the significant costs for management of not sorted recyclable waste because companies that buy waste as raw material don't want to buy unsorted waste.
3. Demanding legislation for the construction of recycling yards.

3.3.4 Circular Economy

The promotion of circular economy is mostly done through conferences about sustainable waste management and environmental protection by the government representatives. In that respect, the Government has recognized the need to reduce bio-waste on landfills and to use it in plants for producing biogas. With the new legislation, the government strengthened regional and local governments to take responsibility for the goals of municipal waste management.

On 4 July 2018, new EU rules have entered into force with legally binding targets for waste recycling and reduction of fixed-waste disposal for the Member States including Croatia that have to make adjustments to national legislation for the transition to a circular economy over the next two years.

No.	Indicator	Unit	Croatia 2014	Croatia 2015	Croatia 2018	Data source
1	Total population	Number			4.284.889	NALAS TF Questionnaire
2	Country income level (GNI)	$			13,830	http://data.worldbank.org/
3	MSW generation per capita	kg/cap/day			0.83	NALAS TF questionnaire, National Statistics
4a	MSW landfilled	%			72.4	NALAS TF questionnaire, National Statistics
4b	MSW in illegal open dumps	%			10.86	NALAS TF questionnaire, National Statistics
4c	Waste recovered by recycling	%			21.3	NALAS TF questionnaire, National Statistics
4d	MSW biological treatment	%			2.2	NALAS TF questionnaire, National Statistics
4f	MSW treated in thermal plants	%			0.05	NALAS TF questionnaire, National Statistics
5	Recycling rate	%			21.3	NALAS TF questionnaire, National Statistics
6a	Sanitary regional landfills	Number			2	NALAS TF questionnaire, National Statistics
6b	Non-compliant municipal landfills	Number			98	NALAS TF questionnaire, National Statistics
6c	Illegal dumpsites	Number			n/a	NALAS TF questionnaire, National Statistics
6d	Landfill for inert waste	Number			n/a	NALAS TF questionnaire, National Statistics
7	Population covered by MSW collection service	%			99	NALAS TF questionnaire, National Statistics
8	Population covered by compliant landfills	%			97.3	NALAS TF questionnaire, National Statistics
9	Material footprint	Number			11.01	NALAS TF questionnaire, National Statistics

Table 6. Waste management indicators for Croatia (2014 – 2018)

3.4 Kosovo

3.4.1 Waste management framework

The waste management sector in Kosovo is in the process of harmonizing with EU environmental acquis. It is governed by Law on Waste (No. 2012/04-L-060). The Law introduces European standards and sets certain objectives in the waste management field like prevention and reduction of the generation of waste, reuse of used components from waste, sustainable development through protection and preservation of human resources, prevention of negative effects of waste in environment and human health, and final disposal of waste in an environmental acceptable way. Other legal acts that regulate waste management include Law on Environmental Protection (No. 2009/03-L-025), and series of by-laws in the form of administrative instructions like those on landfill management, environmental information system, waste management of wastes from construction and demolition of the building objects, and other on special waste streams, inspection, fees, etc. Kosovo Strategy on Waste Management was adopted in 2012 for 10 years period in line with the requirements set in the Law on Waste and Law on Environmental Protection.

n of the Ministry of Environment and Spatial Planning is defined by UNMIK Regulations No. 2002/5 and 2005/15. This Ministry is responsible for policy and plans development, permit issuance, coordination and supervision, and implementation of international conventions. Out of 8 departments within the Ministry Department of Environmental protection is in charge of waste-related issues. Kosovo Environmental Agency also operates under the Ministry.

Local authorities are responsible for establishing waste management systems on their territories, developing and adopting local waste management plans that need to be in line with the national plan and providing conditions for their implementation through public utility departments and local inspectorates. Municipalities are also responsible for creating an enabling environment, selection of the operator model for collection and tariff setting. Waste management services may be provided by a public utility company, or it can be delegated to a private entity through a PPP model.

Kosovo Landfill Management Company (KLMC) is operating under Ministry in charge of Economic Development and is tasked with the management of waste facilities including landfills and transfer stations and for the final disposal of waste in Kosovo.

Regional Waste Companies are operators owned by the municipalities and provide collection and transportation services. Seven regional companies are operating in 26 municipalities covering 93% of the population.

Data collection on the national level is performed by the Kosovo Agency for Environmental Protection (KEPA), on an annual basis. Data collection on the local level is performed by the Ministry of Local Government Administration. At the local level, municipalities are responsible for collecting waste management data for their operators and reporting to the Agency. Law on Waste stipulates that the waste data is reported to the Kosovo Environmental Agency by the local government units and waste operators. The Agency is compiling reports and is responsible for reporting to EEA and Eurostat.

There are currently 5 sanitary regional and 2 municipal sanitary landfills in Kosovo:

- Prishtine, (GPS coordinates: latitude 42°39'N and longitude 21°02'E)
- Gjilan (GPS coordinates: latitude 42°26'N and longitude 21°29'E)
- Prizren (GPS coordinates: latitude 42°15'N and longitude 20°41'E)
- Mitrovice (GPS coordinates: latitude 42°52'N and longitude 20°54'E)
- Peje (GPS coordinates: latitude 42o40'N and longitude 20o17'E)
- Podujevë municipal landfill
- Dragash municipal landfill

Reported data indicates that there are 4 non-compliant municipal landfills. The number of illegal dumpsites is estimated to 2529. There are no sites for inert waste. 75,60% of the population is covered by the organized waste collection. The generation of waste is 0,78 kg per capita.

3.4.2 Recent achievements

Waste Law amending is in process and in addition to that KEPA is drafting the sub-legal act on regulating reporting and monitoring of waste management data from actors.

3.4.3 Assessment of progress

Kosovo waste management sector has shown some significant improvements since the last report. Namely, in the previous period, two additional sanitary landfills have been put in operation, waste management service coverage has been increased significantly and now stands at 75,60%. The generation of waste per capita has dropped from 0,9 to 0,78 kilograms.

3.4.4 Circular Economy

The circular economy approach is recognized and introduced in the Law on Waste, National Strategy for Waste Management and with activities regarding introducing Extended Producer Responsibility through a Deposit Refund System for Beverage Containers, and in the local level in local waste management plans. The Law on Waste introduced principles like waste prevention and reduction, reuse waste materials and products, sustainable use of resources, prevention of negative effects on the environment.

No.	Indicator	Unit	Kosovo 2014	Kosovo 2015	Kosovo 2018	Data source
1	Total population	Number	1,812,771	1,797,151	1,845,300	http://data.worldbank.org/
2	Country income level (GNI)	$	4,010	3,970	4,230	http://data.worldbank.org/
3	MSW generation per capita	kg/cap/day	0.9	0.9	0,78	NALAS TF questionnaire, Kosovo Statistical Office
4a	MSW landfilled	%	90	90	n/a	NALAS TF questionnaire,
4b	MSW in illegal open dumps	%	0	0	n/a	NALAS TF questionnaire,
4c	Waste recovered by recycling	%	9	9	n/a	NALAS TF questionnaire,
4d	MSW biological treatment	%	1	1	n/a	NALAS TF questionnaire,
4f	MSW treated in thermal plants	%	0	0	n/a	NALAS TF questionnaire,
5	Recycling rate	%	N/A	N/A	n/a	NALAS TF questionnaire,
6a	Sanitary regional landfills	Number	5	5	7	NALAS TF questionnaire,
6b	Non-compliant municipal landfills	Number	N/A	61	4	NALAS TF questionnaire,
6c	Illegal dumpsites	Number	N/A	Approx. 700+	2529	NALAS TF questionnaire,
6d	Landfill for inert waste	Number	N/A	0	n/a	NALAS TF questionnaire,
7	Population covered by MSW collection service	%			75,60%	NALAS TF questionnaire,
8	Population covered by compliant landfills	%			92%	NALAS TF questionnaire,
9	Material footprint	Number			n/a	

Table 7. Waste management indicators for Kosovo (2014—2018)

3.5 Moldova

3.5.1 Waste management framework

In the recent period, there have been significant legal activities in Moldova regarding the waste management sector. New laws on waste and statistics have been adopted and now waste management in Moldova is regulated by the following laws:

- Law No. 209 of 29.07.2016 on Waste
- Law on Environmental Protection, no. 1515-XII, 1993
- Law on Ecological Expertise and Environmental Impact Assessment, no. 851-XIII, 1996.
- Law on Environmental Impact Assessment, No. 84 of 29.05.2014.

The new Law on Waste which entered into force as of 23 December 2017 aligns the national legislation to EU provisions as stipulated in the Moldova-EU Association Agreement. The Law contains among other provisions on the adoption of the European List of Waste.

The National Solid Waste Management Strategy of the Republic of Moldova (2013-2027) was developed in line with the EU Directives and sets waste management goals in line with the EU principles and clear objectives and implementation measurement. It includes requirements to start restructuring the legal and institutional framework and develop an integrated system comprising technical and environmental regulation in the field of separate waste collection, recycling, recovery, storage, and waste disposal. The Strategy aims to establish regional waste management in eight regions.

At the national level, two institutions have a role to play within the waste management system in Moldova. Those are the Ministry of Agriculture, Regional Development and Environment and the Environmental agency. By the law, the Ministry strives to:

- achieve the objectives and establishes the priority directions in the field of waste management;
- approve the National Strategy for Waste Management and the National Program for Waste Management;
- approve the normative acts in the field of waste management to ensure the implementation of this law, including the methodology for calculating tariffs in this field;
- determine how to manage certain categories of waste, including hazardous ones, following the provisions of this law and international law;
- if the authorities of the local public administration do not agree within 3 months from the moment of their notification, make the final decisions for the placement of regional objects of national importance regarding the recovery, treatment, recycling, disposal, storage or burial of waste, with the condition of observing the environmental requirements, according to the Law of expropriation for a public utility cause no. 488-XIV of July 8, 1999, and other social requirements.

Local authorities within the waste management system are tasked with:

- creating an efficient system of collection, of step-by-step assurance of the conditions for separate collection and transport of waste and establishing its functioning,
- the allocation of the lands necessary for the separate collection of waste, including for the collection of waste products subject to the extended producer responsibility regulations, equipping them with containers specific to the types of waste, as well as their functionality;
- the arrangement of special spaces for the storage of the separately collected wastes, properly sized, to ensure the protection of the environment and the health of the population;
- the storage of municipal waste only in places specially arranged following the urban planning documentation;
- the record of the data and information regarding the waste and the management of the municipal waste collected from the population, from the commercial units and institutions, based on a contract, reporting these data annually, through the operators of municipal waste management, to the central environmental body of the public administration plants according to the methodology for keeping records and for transmitting information, approved by the Government.

They should also contribute to the establishment of an integrated waste management system at the regional level and ensure regional cooperation to set up regional waste management associations.

The Environmental Agency is main administrative authority that ensures the implementation of the environmental legislation, harmonized with the European Union legislation provided

in the Association Agreement and the implementation of the new environmental instruments such as environmental impact assessment system from economic activities, strategic environmental assessment, integrated ecological monitoring, integrated environmental authorization, integrated waste management, integrated environmental information system management. Environment Agency is also tasked with the issuing of permissive acts for activities with an impact on the environment and the function of monitoring the quality of the environment through the creation of the Environmental Reference Laboratory;

Within the ministry, there is a unit for the implementation of environmental projects in charge of programming, preparation, and implementation of environmental projects.

Data collection on waste is under the jurisdiction of the National Statistical Bureau of Moldova and is regulated by the Law on Waste and the Law No. 93 of 26.05.2017 regarding the official statistics and the Government Decision no. 501 of May 29, 2018, for the approval of the Instruction regarding the keeping of records and the transmission of data and information on waste and their management. Local governments are responsible for the organization of waste collection and disposal systems. Reporting to European institutions i.e. European Environmental Agency is regulated by Law on Waste and the Governmental Decision No. 549 of 13.06.2018 regarding the establishment, organization, and functioning of the Environmental Agency.

Waste management inspection is done through the Inspectorate for Environmental Protection that has the function of state surveillance and ecological control on all environmental components.

3.5.2 Recent achievements

During 2016-2018, the legal framework regarding Municipal Waste Management was modified. Following legal acts were adopted:

- Law on Waste, No. 209 from 29.07.2016;
- Government Decision no. 501 of May 29, 2018, for the approval of the Instruction regarding the keeping of records and the transmission of data and information on waste and waste management;
- Regulation on the waste of electrical and electronic equipment (Government Decision no. 212 of March 7, 2018).

In 2017 after Central Public Authorities Reform, Waste Management at the Central Level became the responsibility of the Ministry of Agriculture, Regional Development and Environment. According to the specific objective No. 8 of the environmental strategy for the years 2014-2023 "Creating integrated waste and chemical management systems, which would contribute to a 30% reduction in the amount of waste deposited and a 20% increase in the recycling rate by 2023".

During 2016-2018 following activities were carried out:

- development of ecological platforms for the collection of household waste in Chisinau municipality;
- Mechanized waste collection and transportation in Cornești city, Ungheni district;
- Optimization of the solid waste management system in Vulcanesti district and Calarasi city).

The implementation of these projects will contribute to the organization of municipal waste collection systems and the optimization of the development of public sanitation services. Also, investment projects were implemented on the evacuation and destruction of pesticide stocks, including in the category of persistent organic pollutants, accumulated on the territory of the Soviet period. Thus, in the first half of 2018, the final evacuations of pesticides were made with the support of the NATO-OSCE-ENVESC project on the destruction of pesticides and hazardous chemicals in the Republic of Moldova.

At the same time, in 2018, the company Red Union Fenosa initiated a project for repacking, evaluating and disposing of stocks of electrical equipment containing BPC (polychlorinated biphenyls).

Regarding the Governmental decision on the modification and completion of the Action Plan for the implementation of the Waste Management Strategy in the Republic of Moldova for the years 2013-2027 (GD no. 248 of April 10, 2013), preliminary version was prepared based on the proposals of ministries and institutions. Still, this process did not continue after 2018. Due to the request of the Government, it was necessary to develop a new concept in the field of waste management which would involve integration of the new tendencies of recovery in energy aspect, the recycling and the elimination according to the waste hierarchy, as well as the redistribution of the responsibilities of the authorities involved in managing project investments.

3.5.3 Assessment of progress

In Moldova, no sanitary regional landfills have been reported.

The number of non-compliant municipal landfills has slightly increased from 1120 to 1147. Recycling rate out of recyclables has also somewhat increased from 6,29% to 8,97%. In Moldova waste generation is also increasing and now is at 0,78 kg per capita per day. Although it is reported that the number of illegal open dumpsites is decreasing (from 900 to 850) still 25% of municipal waste ends there while 75% is deposited onto municipal landfill sites. Service coverage is still very low and stands at 35,20%.

The population covered by authorized landfills is 80%. The data from the report mostly is based on data obtained from the National Statistical Bureau of Moldova and some estimation was made by experts in cases of unavailable official data.

3.5.4 Circular Economy

The notion of the circular economy is not found in the national strategies related to Solid Waste Management, because they were not elaborated and approved until December 2015, when the EU approved the action plan aimed at accelerating the transition to the circular economy. But lately, both in the academic environment, as well as among national and international experts, the notion of the circular economy is used and promoted in the Republic of Moldova.

With the entry into force of Law no. 209 of July 29, 2016, regarding waste, through art. 12, the main requirements regarding extended producer responsibility (REP) are established. A first step in implementing the principle of extended producer responsibility is the approval of the Waste Regulation of electrical and electronic equipment (Government Decision no. 212 of March 7, 2018) which provides that waste electrical and electronic equipment (WEEE) will be collected by collective systems (producers, importers) under favorable conditions for final consumers (population), with the targets set in the country for WEEE.

Regarding the promotion of circular economy, Moldova has a National Program to promote the green economy for the period 2018-2020, and some domestic producers are already successfully implementing principles of the circular economy. For the implementation of the program, the allocation of 122 million lei (approx. 6.1 million Euro) is expected during 3 years of implementation. Also, the academic environment and the civil sector promote the principles of the circular economy through mass media and different training and capacity development activities in the respective field. Every year from 2016 there is a round table "Green Economy. Made in Moldova", involving representatives of the central authorities, the business environment, civil society in the field of environment, and development partners.

During 2017-18 there were registered 36 installations producing renewable energy, mounted during 13 solar installations, with a total power of 1503.5 kW; 20 wind installations, with a total power of 33280 kW; 2 installations on Biogas, with the power of 1704; 1 Hydropower, with the power of 254.

The project "Strengthening local capacities for the production of solar collectors in the Republic of Moldova", funded by the Ministry of Economy of the Republic of Poland. The project aimed to promote the use of renewable energy in the country and create jobs by installing a production line of solar collectors equipped with advanced modern technologies and employing qualified men and women.

The project "Bilateral cooperation for the introduction of technologies that use renewable energy resources in Moldova" financed by the Ministry of Environment of the Republic of Lithuania. The main objective of the project was to design, implement, monitor and evaluate the functionality of a photovoltaic installation with a capacity of 55 kW. The project demonstrated the technical and economic viability of the new technologies of energy to supplement traditional sources of electricity and will contribute to reducing greenhouse gas emissions through the use of photovoltaic (PV) systems.

No.	Indicator	Unit	Moldova 2014	Moldova 2015	Moldova 2018	Data source
1	Total population	Number	3,556,397	3,554,150	3,547,539	http://data.worldbank.org/
2	Country income level (GNI)	$	2,560	2,240	2,990	http://data.worldbank.org/
3	MSW generation per capita	kg/cap/day	0.6	0,75	0.78	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
4a	MSW landfilled	%	0	75	75	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
4b	MSW in illegal open dumps	%	100%	25	25	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
4c	Waste recovered by recycling	%	0	2	2	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
4d	MSW biological treatment	%	0	0	0	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
4f	MSW treated in thermal plants	%	0	0	0	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
5	Recycling rate	%	0	6.29	8.97	NALAS TF questionnaire, National Waste Management Strategy 2013—2027
6a	Sanitary regional landfills	Number	N/A	0	0	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
6b	Non-compliant municipal landfills	Number	N/A	1120	1147	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
6c	Illegal dumpsites	Number	N/A	900	850	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013—2027
6d	Landfill for inert waste	Number	N/A	0	0	NALAS TF questionnaire, National Statistical Bureau of Moldova, National Waste Management Strategy 2013 – 2027
7	Population covered by MSW collection service	%	N/A	31.28	35.20	NALAS TF questionnaire, National Statistical Bureau of Moldova
8	Population covered by compliant landfills	%	N/A	0.77	0.80	NALAS TF questionnaire, National Statistical Bureau of Moldova
9	Material footprint	Number	N/A	7.7	7.7	NALAS TF questionnaire, National Statistical Bureau of Moldova

Table 8. Waste management indicators for Moldova (2014—2018)

3.6 Montenegro

3.6.1 Waste management framework

The legal framework in Montenegro consists of laws and strategies adopted by the Parliament, decisions of the Government and other regulations. The following laws are of most importance for the waste managing sector in Montenegro:

- Law on Environment (O.G. of Montenegro, no. 52/16
- Law on Nature Protection (O.G. of Montenegro, no. 54/16)
- Law on Waste Management (O.G. of Montenegro, no. 64/11, 039/16 as of 29 June 2016);
- Law on Inspection (O.G. of Montenegro, no. 39/03, 76/09, 57/11, 18/14, 11/15, 52/16);
- Law on Communal Utilities (O.G. of Montenegro, no. 74/16).

The National Strategy with Action Plan for transposition, implementation, and enforcement of the EU acquis on Environment and Climate Change 2016-2020 has been adopted to achieve gradual and complete transposition of the entire EU acquis for Chapter 27-Environment and Climate Change into the legal system of Montenegro. Regarding that most laws related to the environment and thus waste management have been newly adopted or amended within the last three years.

Also, the Montenegrin government has adopted a decision amending the state Waste Management Plan for 2015-2020, eliminating an option to build a waste incinerator, though still allowing for smaller thermal treatment facilities. Before the amendments, the waste incinerator was envisaged as an option at a waste management center in Niksic. The amended plan now anticipates four regional waste management centers, with a focus on recycling and construction and demolition waste (CDW) treatment. At this point, there are two waste management centers in Montenegro: Podgorica and Bar, while two new ones are planned to be in Niksic and Bijelo Polje. Podgorica and Bar are also cities where regional landfills are situated:

1. Livade, Podgorica (GPS coordinates: latitude 42.416443 and longitude 19.305784)
2. Možura, Bar (GPS coordinates: latitude 42.042497 and longitude 19.169510)

The remaining municipalities deposit their waste on 15 non-compliant landfills. However, there is still population not covered by waste management services, thus 158 illegal dumpsites are still present, which is half of the number reported in the year 2015. There are also two inert waste landfills in Montenegro.

Ministry of sustainable development and tourism is primarily competent for the transposition of EU legislation and for governing the issues regulated by the EU legislation whose transposition is not obligatory, as well as for the implementation and monitoring of the implementation of domestic waste management legislation.

Environmental protection agency— EPA is responsible for the conduct of administrative procedures and issuance of permits, collection, processing, and maintenance of waste databases on waste and reporting.

The MONSTAT is the institution competent for the collection and statistical processing of data on certain types and amounts of waste, as well as for EUROSTAT reporting.

Local self-government units are competent for the establishment of necessary infrastructure and provision of services relating to municipal waste management.

AIA (ecological, market and mining inspection) is competent for the inspection supervision over the implementation of legislation in the area of waste management, while at the local level, municipal inspections are competent for certain types of supervision in the area of municipal waste management.

3.6.2 Recent achievements

Recent developments in the waste sector in Montenegro would greatly rely on new legislation. Amended Law on Waste Management defines details on data collection and procedures and obligations for the data collection on waste quantities, while the obligation to keep the data registry and information system on environment protection are on EPA. EPA is also responsible for keeping the registry of waste collectors.

Montenegro Government has adopted Regulation on the methodology for determining the composition and quantity of municipal waste on the territory of local self-government unit Official Gazette of Montenegro 025/18 as a result of Policy recommendations from Solid Waste Data Collection in South-East Europe Project, supported by GIZ.

National Waste Management Plan 2015-2020 has been amended and the target was set on waste minimization, prevention, and recycling, allowing four regional waste management centers and excluding incinerators as an option.

3.6.3 Assessment of progress

Montenegro is showing progress in some areas giving the fact that waste collection coverage is higher along with the higher percentage of population covered by compliant landfills. However, there are still only two sanitary landfills, even though the number of illegal dumpsites has been cut in half since the last report. The biggest improvement is in the implementation of recycling since the recycling rate is more than triple 16,91%.

3.6.4 Circular Economy

Even though the circular economy has not been implemented in the national legislation as a separate law, there are several laws on special waste streams determining targets to be reached (recycling, reduction in production, etc.) as well as EPR (Extended Producers Responsibility) for all. The status of by-product, when derived from waste, is regulated by Law on waste management Article 8, as well as when a specific part of the waste is no longer treated as waste (Article 9.) There is also a separate Decree amending the Decommissioning Criteria Decree wastes from iron, steel, aluminum, copper and glass (Official Gazette of Montenegro 31/17). Besides, keeping in mind CE principles, there is the regulation on design and packaging in concern of energy consumption— Rule book about the eco-design of products affecting energy consumption ("Official Gazette of Montenegro", No. 073/18). Overall, national legislation and strategies recognize CE, but common knowledge as well as of operators on the local level is insufficient.

No.	Indicator	Unit	Montenegro 2014	Montenegro 2015	Montenegro 2018	Data source
1	Total population	Number	621,521	622,099	628,960	NALAS TF Questionnaire
2	Country income level (GNI)	$	7,320	7,220	8400	http://data.worldbank.org/
3	MSW generation per capita	kg/cap/day	1.46	1.44	1.41	NALAS TF questionnaire, National Statistics
4a	MSW landfilled	%	86%	86%	81	NALAS TF questionnaire, National Statistics
4b	MSW in illegal open dumps	%	11	12	10.86	NALAS TF questionnaire, National Statistics
4c	Waste recovered by recycling	%	2,4%	1,9%	8.14%	NALAS TF questionnaire, National Statistics
4d	MSW biological treatment	%	0	0	0	NALAS TF questionnaire, National Statistics
4f	MSW treated in thermal plants	%	0	0	0	NALAS TF questionnaire, National Statistics
5	Recycling rate	%	5%	6%	16.91	NALAS TF questionnaire, National Statistics
6a	Sanitary regional landfills	Number	2	2	2	NALAS TF questionnaire, National Statistics
6b	Non-compliant municipal landfills	Number	10	10	15	NALAS TF questionnaire, National Statistics
6c	Illegal dumpsites	Number	Approx. 350	Approx. 300	158	NALAS TF questionnaire, National Statistics
6d	Landfill for inert waste	Number	0	0	2	NALAS TF questionnaire, National Statistics
7	Population covered by MSW collection service	%		90.83	90.32	NALAS TF questionnaire, National Statistics
8	Population covered by compliant landfills	%		68.32	71.07	NALAS TF questionnaire, National Statistics
9	Material footprint	Number		4.40	13.87	NALAS TF questionnaire, National Statistics

Table 9. Waste management indicators for Montenegro (2014—2018)

3.7 North Macedonia

3.7.1 Waste management framework

North Macedonia as other Western Balkan countries is in the process of harmonizing legislation with the EU. Some new initiatives in the waste sector are present but currently, it is regulated by the following laws:

- Law on Waste Management (O.G. of RM no. 9/11, 51/11, 123/11, 147/13, 163/13, 39/16,63/16),
- Law on Management of Packaging and Packaging Waste (O.G. of RM no. 161/09, 136/11, 17/11, 47/11, 6/12, 39/12, 163/13, 146/15,39/16)
- Law on Management of Electric and Electronic Equipment and Management of Electric and Electronic Equipment Waste (O.G. of RM no. 6/12, 163/13)
- Law on Batteries and Accumulators and Waste Batteries and Accumulators (O.G. of RM no. 140/10, 47/11, 148/11, 39/12, 163/13, 146/15,39/16)

On the strategic level in the waste sector of North Macedonia, the National Waste Management Strategy for the period 2008-2020 (O.G. of RM no. 39/08) is still the most important document. When it was adopted in 2008 it aimed to contribute to overcoming the poor situation concerning impact of improper waste management to environment, to reduce waste quantities and impact of hazardous waste, and to achieve the optimal material/energy recovery, final disposal of waste in line with EU standards, and introduce cleaner production technologies and sustainable management of natural resources and waste. At that time number of other strategies were adopted and in power like Environmental Approximation Strategy, National Strategy for Sustainable Development in the Republic of Macedonia and some others. Still, all of those documents are long overdue and therefore the process of drafting new strategic documents in North Macedonia is currently ongoing.

Responsibilities in waste management are divided among several institutions. The institution responsible for policy-making and planning is the Ministry of Environment and Physical Planning. Municipalities are in charge of organizing and setting up waste management systems at the local level. Municipalities are responsible for organizing the collection, transport, and disposal of municipal waste; deciding on the location of waste management facilities; issuing local waste management regulations; financing and supervising dump/landfill closures and closing down waste management facilities.

That collection of data on waste management is organized by the Ministry of Environment and Physical Planning through Macedonian Environmental Information Centre (MEIC). Municipalities and the City of Skopje organize data collection on the local level and collect data about the general situation related to non-hazardous waste management. Data is processed and sent to MEIC, which is an expert institution in the field of environment. MEIC processes data and submits it to the public administration responsible for environmental affairs. The main role of MEIC is to provide systematized and standardized information on key environmental media. Macedonia has been reporting to EEA since 1997, and reports are submitted through the Ministry of Environment and Physical Planning.

Competent authorities for inspection and other enforcement tasks at the central level are the State Environmental Inspectorate and the Inspection Council as an independent body. Competent authorities for inspections at the local level are municipality inspection departments.

Macedonia has 1 sanitary regional landfill located in Drisla, Batinci (GPS coordinates: latitude 41°55'N and longitude 21°28'E).

Data obtained from 2018 Environmental Statistics, shows that there are now 54 non-compliant municipal landfills an increase compared to 47 in the last report. Illegal dumpsites are not registered, but estimations are that there are around 1100 illegal dumpsites compared to 1000 in 2015. The population covered with waste collection service is high and is at 85%, and the percentage of citizens that are covered with compliant landfills is 45%. The increasing trend in waste generation per capita has continued and is now 1,13 kg in comparison with 1,06 kg per capita in 2015.

3.7.2 Recent achievements

Current North Macedonian legislation on waste management has three main goals to avoid waste generation and reduce the impact of waste on the environment, life, and health, to improve production technologies, reduce waste generation and packaging and to use ecological products, and to start recycling and reusing of waste. Even though a legal framework for waste management exists there are significant problems with its implementation. The new Law on Waste and the national waste prevention plan have not been adopted yet, but the new National Waste Management Plan for 2018-2024 has been drafted and is awaiting adoption. The new approach is to encourage reusing, recycling, composting and incinerating waste with energy recovery as well as source separation. In the field of waste management, there is currently one ongoing Twinning project "Strengthening the administrative capacities for implementation

of Waste Framework Directive (WFD) and Special Waste Streams Directives (WEEED, WBAD, and WPD)".

3.7.3 Assessment of progress

In the period from 2015 to 2018, regional waste management plans have been developed in an additional 6 regions. The only region remaining without a regional management plan is Polog Planning Region.

There are no significant changes in the indicators provided in North Macedonia. Waste generation per capita has slightly increased to 1,13 kg per capita per day. North Macedonia is still landfilling the majority of generated municipal waste. For the last period, it is reported that 99. 5% of waste is disposal on landfills. As before only small amounts of waste are recycled, 0,5%. Visible progress can be seen in the recycling of packaging waste with the latest rate of 42,07%.

3.7.4 Circular Economy

Although in the acting waste management strategy many of the circular economy principles can be identified, the new waste management law that is currently in the process of adoption (second reading– under the legal procedure) will introduce a separate chapter on the circular economy.

3.8 Romania

3.8.1 Waste management framework

As a member state, Romania is obliged to follow EU waste regulation predominantly by Waste Framework Directive 2008/98/EC but also other directives on the landfill of waste, incineration of waste, packaging waste, end of life vehicles and others. Solid waste management in Romania is regulated by the following laws:

- Government Emergency Ordinance No. 195/2005 on environmental protection, as amended (GEO 195/2005);
- Law No. 211/2011 on the waste regime (Law 211/2011);
- Law 101 / 2006 regarding city sanitation
- Law no. 249/2015 regarding the management of packaging and packaging generated waste
- Government Decision no. 856/2002 on waste management
- Governmental Decision no. 349/2005 on the framework for landfilling of waste

There were also some recent changes to the laws and decisions governing waste management. Government Emergency Ordinance no. 74/2018 passed for the amendment and completion of Law no. 211/2011 on waste, as well as Law no. 249/2015 on packaging and packaging waste management Also a Governmental Ordinance regarding Environmental Fund was passed.

The responsibility for the collection and management of municipal solid waste belongs to municipalities. Local authorities are involved in the practical implications of setting up systems for separate collection, processing, storing, etc., as well as the coordination of activities in the field of separate collection and organization of waste recycling.

Data collection on MSW indicators and waste statistics is regulated by a set of laws:

- Law 211/2011 regarding waste regulation,
- Law 51/2006 regarding public utility services,
- Law 101/2006 regarding city sanitation,
- Governmental Decision 856/2002 regarding waste management.

The Romanian Environment Protection Agency is responsible for the collection of waste data, national reporting and reporting to the EEA as regulated by Law 51/2006.

Waste management remains one of the key challenges for Romania regarding the environmental sector. Waste management performance is characterized by very low recycling of municipal waste compared to other EU member states (11,1% compared to EU 28 average of 46,4%) and very high landfilling rates. This is contrary to the waste hierarchy and comes despite the recycling targets set at the EU level. Waste generation per capita is at 0,61 kg per day. The population in Romania covered by waste management service is 80%. There are 10 non-compliant municipal landfills reported but there was no data on regional sanitary landfills and illegal dumpsites. Inert waste is disposed on sanitary landfills. No separate landfill for inert waste is constructed in Romania.

3.8.2 Recent achievements

Romania has made certain progress in waste management with the adoption of the National waste management plan in December 2017. Recycling and resource efficiency is still low if compared with the EU average. Still, at this moment is hard to discuss achievements because Romania only just started to implement Governmental Decision 74 by preparing necessary documents for its implementation.

Government Emergency Ordinance no. 74/2018 was issued on 17 July 2018 for the amendment and completion of Law no. 211/2011 regarding the waste regime, of Law no. 249/2015 regarding packaging and packaging waste management and of Government Emergency Ordinance no. 196/2005 regarding the

Environmental Fund. The Emergency Ordinance brings several legislative changes, in particular in the field of packaging and packaging waste management. The legislative amendments were drafted to align Romania with the European waste management legislation and of implementing the "pay-as-you-throw" economic instruments, the "extended producer responsibility" and the "landfill tax", as well as establishing the responsibilities of all the parties involved, including those changes resulting from promoting the circular economy package. Moreover, taking into account the European Commission approach, which is reflected in the circular economy package, a "contribution for the circular economy" has been established to replace the landfill tax.

Order no. 149/2019 has been published, amending and supplementing the Annex to Ministry of Environment and Water Order no. 578/2006 approving the Methodology for the calculation of contributions and fees due to the Environment Fund. The new Order clarifies various aspects regarding the practical ways in which companies have to fulfill their obligations related, mainly, to the management of packaging and packaging waste. It details the mechanisms for implementing the obligations imposed by EGO 74/2018, published in July 2018.

Law no. 31/2019 has been adopted, on the approval, with amendments and completions, of Emergency Ordinance no. 74/2018. The Law amends and clarifies several aspects of packaging and packaging waste management.

3.8.3 Circular Economy

The EU Circular Economy Action Plan emphasizes the need to move towards a life-cycle-driven 'circular' economy, reusing resources as much as possible and bringing residual waste close to zero. This can be facilitated by developing and providing access to innovative financial instruments and funding for eco-innovation. Romania as a member state should introduce policies created under the EU circular package. Although there is a basis for the circular economy at the strategic and legal level there are no instructions on implementation so all the actors in that field are creating steps as they understand the law.

No.	Indicator	Unit	Romania 2014	Romania 2015	Romania 2018	Data source
1	Total population	Number	19,550,000	19,550,000	22.194.000	NALAS TF Questionnaire, Romanian Statistical Office
2	Country income level (GNI)	$	6,195	6,500	11.290	NALAS TF Questionnaire, Romanian Statistical Office
3	MSW generation per capita	Kg per day	0,88	0,90	0,61	NALAS TF Questionnaire, Romanian Statistical Office
4a	MSW landfilled	%	85	85	85	NALAS TF Questionnaire, Romanian Statistical Office
4b	MSW in illegal open dumps	%	5	5	0	NALAS TF Questionnaire, Romanian Statistical Office
4c	Waste recovered by recycling	%	7	7	2	NALAS TF Questionnaire, Romanian Statistical Office
4d	MSW biological treatment	%	3	3	10	NALAS TF Questionnaire, Romanian Statistical Office
4f	MSW treated in thermal plants	%	0	0	3	NALAS TF Questionnaire, Romanian Statistical Office
5	Recycling rate	%	13,1	13,3	24	NALAS TF Questionnaire, Romanian Statistical Office
6a	Sanitary regional landfills	Number	17	34	37	NALAS TF Questionnaire, National Statistics
6b	Non-compliant municipal landfills	Number	46	43	10	NALAS TF Questionnaire, National Statistics
6c	Illegal dumpsites	Number	N/A	N/A	0	NALAS TF Questionnaire, National Statistics
6d	Landfills for inert waste	Number	N/A	0	0	NALAS TF questionnaire, National Statistics

7	Population covered by MSW collection service	%			80	NALAS TF questionnaire, National Statistics
8	Population covered by compliant landfills	%			80	NALAS TF questionnaire, National Statistics
9	Material footprint	Number			21,56	Eurostat

Table 11. Waste management indicators for Romania (2014 - 2018)

3.9 Serbia

3.9.1 Waste management framework

Serbia's legal framework is heavily influenced by the EU accession process. This also includes the waste management sector which falls under the Environmental Acquis and negotiations under Chapter 27 – Environment and Climate. The Serbian waste management framework is regulated by the number of laws and accompanying by-laws and regulations. Most important waste management related laws are listed below:

- Law on Local Self-government (O.G. no. 129/2007, 83/2014, 101/2016 and 47/2018)
- Law on Waste Management (O.G. no. 36/09 and 88/10, 14/2016 and 95/2018);
- Law on Packaging and Packaging Waste (O.G. no. 36/09 and 95/2018);
- Law on Environmental Protection (O.G. no. 135/2004, 36/2009, 36/2009, 72/2009, 43/2011, 14/2016, 76/2018, 95/2018 and 95/2018);
- Law on Communal Services (O.G. no 88/2011, 104/2016 and 95/2018)

On the strategic level, the National Waste Management Strategy for the period 2010-19 is still an acting document. Much like on the national level at the municipal level majority of local waste management plans are close to the expiration date. There are also several regional waste management plans prepared in the scope of inter-municipal agreements. Ministry of Environmental protection has started work on the preparation of the new National Waste Management Program 2020-25 which in the current stage of preparation envisage the organization of waste management around the number of regional waste management centers. Serbia has also adopted a Law on Planning System which introduced a hierarchy of planning and policy documents. The main planning document is to be National Development Plan with which all other national, regional, local or sectoral documents need to be aligned. National Development Plan is expected to be adopted in 2020.

The Ministry of Environmental Protection is in charge of the development of national waste policy, while the Construction, Transport and Infrastructure Ministry has jurisdiction over communal service provision. By the law, waste management is one of the original jurisdictions of local authorities. They are responsible for creating the conditions for the provision and development of communal services including tariff setting. Waste management service is provided by public utility companies that are established by the local authorities or can be delegated to private entities under the PPP law.

In the Republic of Serbia, the principle of restrictive employment in the public sector is still in force. However, the Ministry of the Environmental Protection got permission from the Government to hire an additional 180 environmental inspectors at the national level. However, this change is likely to be operationalized only with the adoption of the budget for the coming year. Inspection at the local level is done by local environmental end communal service inspectors.

The Serbian Environmental Protection Agency (SEPA) is in charge of data collection on waste quantities and recyclables, data processing and communication and information to the EEA. General data on service coverage is collected and processed by the State Statistical Office. SEPA collects data on air emissions, water emissions, and waste. The collected data is entered into the database, thus forming the environmental information system of the Republic of Serbia, while monitoring and reporting at the national level are regulated by the Law on Environmental Protection. The Statistical Office of RS reports on waste generation and population served. Reporting to the EEA is regulated by Article 5 of the Law on Ministries (O.G. no. 44/2014, 14/2015, 54/2015, 96/2015 and 62/2017).

Serbia has 11 sanitary landfills (10 regional and one municipal), 123 non-compliant municipal landfills and 1711 reported illegal dumping sites although not all local governments have reported on this issue to SEPA. It is estimated that 12,8% of the waste generated is disposed of at illegal dumps. Waste generation is 0,85 kg per capita per day. Only a very small portion of household waste is being recovered by recycling, more optimistic estimates are around 3-5% although Eurostat is showing a 0.3% rate. Recycling and reuse of packaging waste are much better and in line with national goals. In 2018 reuse of packaging waste was at 57,1% and recycling was 55,3%. Service coverage is relatively high and is at 87,2%.

3.9.2 Recent achievements

During 2018 Serbia has been intensively working on the preparation of the Negotiation Position for Chapter 27 -Environment and Climate. The major part of the position refers to the waste management and the transition periods in which Serbia is to fulfill EU standards. With the support of the EU Delegation Specific Directive Implementation plan for the Waste Framework Directive has also been prepared. These documents will be publicly available once they are adopted by the Government of Serbia. Standing Conference of Towns and Municipalities has been officially part of this process representing the standpoint of local authorities in the Working Group for Chapter 27.

Law on Waste Management has been amended twice since the last reporting period and the changes included provisions regarding restrictions on import of waste for incineration and introduction of the National Waste Management Program and the Program for Waste Prevention Measures. Law on packaging Waste has also been amended in 2018. Other legal changes include amendments to the Law on Communal Service introducing the obligation of service providers to conduct annual surveys on customer satisfaction. Standing Conference has developed a model for this process. Also, Law on Local Self-government undergone changes introducing more precise models for inter-municipal cooperation in the provision of local services. Law on Fees for Use of Public Goods was adopted in 2018. It stipulates that good waste management practice, combined with other good environmental practices, can abolish companies from paying polluter fees. It also sets a framework for fees for special waste streams. This Law has taken over the regulation of environmental protection and improvement fee at the local level. Funds from this fee were often used to finance waste management related projects (introduction of source separation or alike). With changes made municipalities will have difficulties to charge this fee in the future.

The government of Serbia adopted the Decision on joint provision and implementation of waste management in June 2018. This Decision specifies to which regional sanitary landfills local self-government units will dispose of waste in case they have not jointly secured and organized the implementation of waste management.

Other achievements include several local developments like the signing of the biggest PPP project in Serbia for the landfill remediation and development of the waste treatment facility in Belgrade, Vinča. Several local authorities updated their local waste management plans using an innovative participatory process based on experience from Swedish municipalities.

3.9.3 Assessment of progress

Since the 2015 report, some improvements can be observed in Serbia's waste management system. Firstly, the legal basis has been improved and better harmonized with EU requirements. The number of sanitary landfills has increased to 11. Waste generation has been fluctuating and is now at 0,85 kg per capita and at the same time the percentage of waste dumped to illegal sites and the number of these sites have dropped to 12,8% and 1711. The number of non-compliant municipal sites has also dropped from 165 to 123. Recycling of household waste is at a very low point and is between 3-5%. However, Serbia has shown an increase in managing packaging waste which is in 2018 at the reported level of 55,3%.

3.9.4 Circular Economy

Responsibility for the introduction of the circular economy to national policies lies with the Ministry of Environmental Protection which in its organizational structure has Group for Green Economy. This unit is in charge of harmonization of economic development policy with the principles of the circular and green economy. So far, no strategic document at any level has been adopted that specifically deals with the transition to the circular economy. Still, some towns and municipalities have undertaken activities in the field of waste management, energy efficiency or use of renewable energy sources, by themselves or through cooperation within various international projects that can be considered as actions in line with the principles of the circular economy.

There are no national or local financial mechanisms to support the circular economy, but some of the international organizations and partners like UNDP, GIZ, OSCE or EU through Climate KIC and PLAC project are providing support to the Ministry, Serbian Chamber of Commerce and Industry, Standing Conference and municipalities with the promotion of the topic.

No.	Indicator	Unit	Serbia 2014	Serbia 2015	Serbia 2018	Data source
1	Total population	Number	7,186,862	7,186,862	7,186,862	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
2	Country income level (GNI)	$	5,820	5,960	6,390	NALAS TF Questionnaire
3	MSW generation per capita	kg/cap/ day	0,81	0.71	0.85	NALAS TF Questionnaire, Serbian Environmental Agency
4a	MSW landfilled	%	65	65	87.2	NALAS TF Questionnaire
4b	MSW in illegal open dumps	%	20	20	12.8	NALAS TF Questionnaire
4c	Waste recovered by recycling	%	n/a	n/a	3	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
4d	MSW biological treatment	%	0	0	0	NALAS TF Questionnaire
4f	MSW treated in thermal plants	%	0	0	0	NALAS TF Questionnaire
5	Recycling rate	%	25%	31%	55,3%	NALAS TF Questionnaire, Serbian Environmental Agency
6a	Sanitary regional landfills	Number	N/A	10	11	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
6b	Non-compliant municipal landfills	Number	N/A	165	123	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
6c	Illegal dumpsites	Number	N/A	3000+	1711	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
6d	Landfill for inert waste	Number	N/A	N/A	N/A	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
7	Population covered by MSW collection service	%			87.2	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
8	Population covered by compliant landfills	%			23.8	NALAS TF Questionnaire, Statistical Office of the Republic of Serbia
9	Material footprint	Number			15.66	

Table 12. Waste management indicators for Serbia (2014—2018)

3.10 Turkey

3.10.1 Waste management framework

Not many changes occurred in legal and institutional frameworks related to waste management since the last report. In Turkey, the primary legislation consisting of laws is constituted in the Turkish Parliament and executed by the Turkish Government, whereas the secondary legislation consisting of regulations is constituted and executed by the corresponding Ministry in charge. The secondary legislation on waste management is defined and executed by the Ministry of Environment and Urbanization. The secondary legislation is in line with the "EU Integrated Environmental Approximation Strategy for Turkey (2007-2023)" Environmental regulations related to solid waste management in Turkey are:

- Law on Environment No. 2872;
- Law on Renewable Energy Resources for Electrical Energy Production No. 5346;
- Law on Municipalities No. 5393;
- Law on Metropolitan Municipalities No. 5216.

Municipalities are responsible for providing all services regarding the collection, transportation, separation, recycling, disposal and storage of solid wastes or for appointing others to provide these services (ETC/SCP, 2009). It is observed that their collection and transportation services are not at the desired level and they do not pay the required level of attention to introduce improvements in the municipal solid waste management system. Municipalities can appoint other legal entities to conduct waste collection and transport services.

Municipalities, rural directorates of the Ministry and the Ministry itself have their distinctive roles in the collection of data on solid waste. Data is transferred to the Turkish Statistical Institution (TURKSTAT), which publishes the Annual Report on Waste Statistics. The Ministry prepares both national reports and reports for the EEA.

Turkey has 87 sanitary regional landfills, and 701 non-compliant municipal landfills. Data on illegal dumpsites was not provided as well as on sites for inert waste.

3.10.2 Recent achievements

In 2018, some amendments have been made to the Turkish Environmental Law. In this context:

- Producers have to pay a recycling share based on market volume at production stage thus the extended producer responsibility mechanism has been strengthened;
- The use of plastic bags has become chargeable. With this arrangement, it was noted that the use of plastic bags decreased by 70% at the beginning of 2019.
- Some packaging types have been considered in the deposit (take back) system. Accordingly, producers within this framework have to establish a take-back system by 2021;

Bylaw on the Control of Medical Waste is updated at the end of 2017. Per the Bylaw, since metropolitan municipalities and other municipalities have to prepare a medical waste management plan in a year after announcing an update of the bylaw, almost all municipalities have been prepared medical waste management plan in 2018 in Turkey. Marmara Region has 11 cities consisting of 6 metropolitan municipalities and 5 provincial municipalities. All cities have prepared medical waste management plan under the coordination of the Provincial Environment Council in the Marmara Region.

Zero waste policy was announced throughout the country at the presidential level. Thus, awareness of waste management and waste prevention has increased at public administrations especially in municipalities, shopping centers, housing estates.

3.10.3 Assessment of progress

Turkey has made significant improvements in waste management practice over the past three years. It has increased the number of regional sanitary landfills from 82 to 87 since the last reporting period. Waste generation per capita has been fluctuating and is now reported at a rate of 1,17 kg per capita per day. The amount of waste dumped on illegal sites has decreased from 30% to 21,72 %. Amounts of waste recycled and treated in MBT plants are still very small so and there is no thermal treatment. The reported recycling rate has increased from 38% to 57,8%.

3.10.4 Circular Economy

The circular economy concept and zero waste approach are considered to intertwine each other in Turkey. Although there is not enough public awareness of the EU Circular Economy Package, the private sector has more theoretical and practical knowledge. Also, the zero-waste policy generally serves the circular economy approach in most of the components. There are no financial mechanisms for the circular economy installed by the government yet. Since there is no regulation on the circular economy there are no official promotion activities but the zero-waste concept is being promoted.

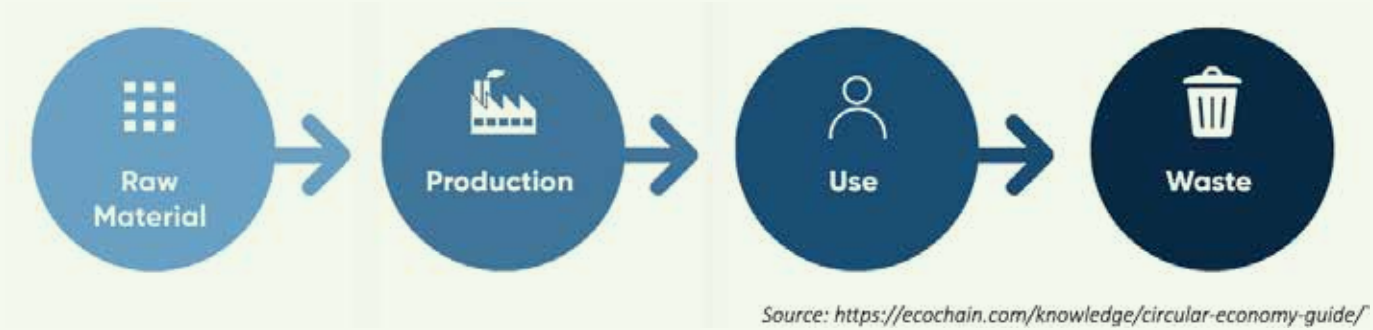
Table 13. Waste management indicators for Turkey (2014 - 2018)

No.	Indicator	Unit	Turkey 2014	Turkey 2015	Turkey 2018	Data source
1	Total population	Number	77,695,904	78,741,053	82,003,882	NALAS TF Questionnaire, TURKSTAT
2	Country income level (GNI)	$	10,840	10,005	10.380	http://data.worldbank.org/ Turkish Statistical Institute, 2018
3	MSW generation per capita	kg/cap/day	1.08	1,17	1,16	NALAS TF Questionnaire, TURKSTAT Turkish Statistical Institute, 2018
4a	MSW landfilled	%	60%	70%	77.63	NALAS TF Questionnaire, TURKSTAT
4b	MSW on illegal open dumps	%	38%	30%	21.72	NALAS TF Questionnaire, TURKSTAT
4c	Waste recovered by recycling	%	0.6%	0.02%	0.51	NALAS TF Questionnaire, TURKSTAT
4d	MSW biological treatment	%	0	0.57	0.14	NALAS TF Questionnaire, TURKSTAT
4f	MSW treated in thermal plants	%	0	0	0	NALAS TF Questionnaire, TURKSTAT
5	Recycling rate	%	N/A	38	57.8	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
6a	Sanitary regional landfills	Number	76	82	87	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
6b	Non-compliant municipal landfills	Number	N/A	701	n/a	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
6c	Illegal dumpsites	Number	N/A	N/A	n/a	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
6d	Landfill for inert waste	Number	N/A	N/A	4	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
7	Population covered by MSW collection service	%			99	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
8	Population covered by compliant landfills	%			74	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)
9	Material footprint	Number			7.21	NALAS TF Questionnaire, (2016-Ministry of Environment and Urbanization)

4 ABOUT CIRCULAR ECONOMY AS AN ADDITION TO THE BENCHMARK REPORT

4.1 A brief overview of circular economy basics

Currently, the linear economy model, which is based on the "take, make, use, dispose" principle is still dominant in the World as well as in Southeast Europe. The core idea of a linear economic model is to achieve growth and social well-being by relying on the exploitation and use of readily available and cheap mineral resources, energy and other natural resources present at the market. However, it is clear today that such a model is unsustainable in the long run. Policies of many countries, including the European Union, support such a standpoint. According to Global Footprint Network[4] estimations, Earth Overshoot Day in 2019 was July 29. This means that till that date human society spent as many natural resources as the planet can sustain in a year. In other words, we are currently using nature 1.75 times faster than Earth's ecosystems can regenerate and are overspending "Earth's capital" on the account of future generations and their well-being.



Source: https://ecochain.com/knowledge/circular-economy-guide/

Figure 1. Outline of the linear economy - take, make, use, dispose - approach (source: Ecocain)

Unlike linear, it is the circular economy that is inherently regenerative and seeks at all times to maintain the maximum usability, usefulness and monetary value of products (in whole or their components), materials and energy. This new economic model seeks to decouple global economic growth from rising demand for scarce natural resources, such as minerals, fossil fuels, and other non-renewable or slow regenerating resources. The circular economy, due to its nature, can be a significant part of the solution to the increasing challenges of the modern world, and one of the responses to the sustainable development goals, by reconciling the need for economic growth and social well-being on the one hand and the scarcity of natural resources and impact to the environment on the other.

4 https://www.footprintnetwork.org/

According to the Ellen MacArthur Foundation, a leading international foundation for circular economy research and policymaking, there are three basic circularity principles: elimination of waste and pollution through the advancement of product design; keeping products and materials in use for as long as possible; and restoration of natural systems. The first principle is based on the detection and elimination of the negative side effects of planning, design, and production. The essence of this principle is the creation of products and processes that, by their very nature, have minimal impact on environmental pollution and the consumption of non-renewable natural resources. The second principle involves optimizing the yield of resources, i.e. maximizing the usefulness of materials, components, and products through their circular movement along economic value chains and keeping them in use as much as possible. The third principle concerns the preservation and enhancement of natural capital. This is achieved by controlling the use of scarce natural resources and stabilizing the flow and use of renewable resources.

There are also three levels of circular economy implementation: micro, meso and macro level. Micro-level refers to the implementation of the principles of circular economy in enterprises and the creation of new, circular, business models. At this level, approaches such as cleaner production, energy efficiency or industrial ecology are integrated into production processes. The meso-level refers to the interaction between different economic entities, which can lead to industrial symbiosis. The macro-level refers to the implementation of circular principles at the broader social level, i.e. at the level of local communities, cities, regions, states and the wider international community.

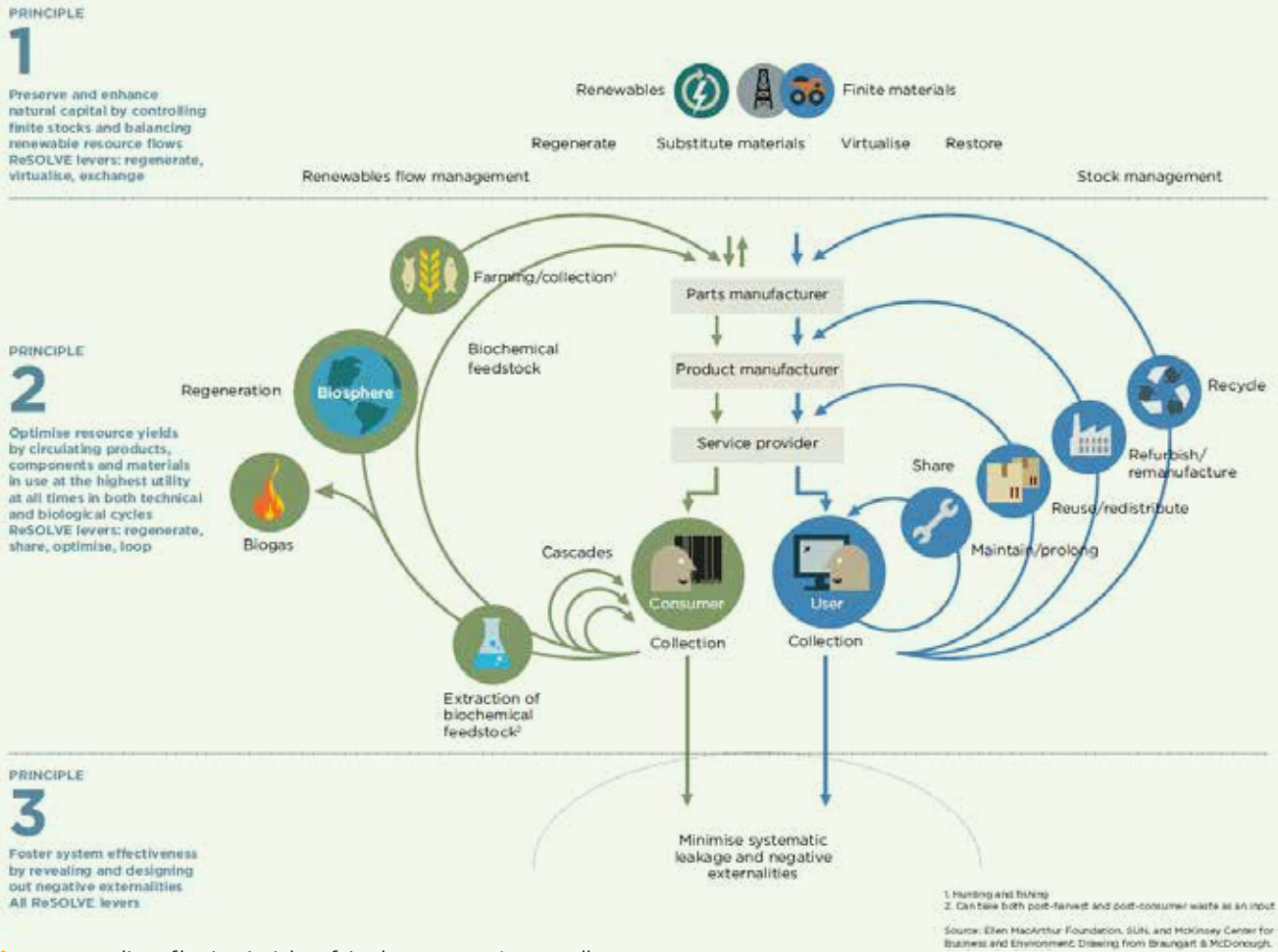


Figure 2. Outline of basic principles of circular economy (source: Ellen MacArthur Foundation)

The practical activities undertaken by economic entities, which are most often related to the circular economy, can be divided into six groups: the transition to the use of renewable energy and materials; extending product life through design and maintenance; improving production efficiency and eliminating waste from supply chains; keeping components and materials "closed loops" through reprocessing and recycling; virtual delivery of goods and services; and the replacement of outdated with advanced renewable materials and the application of new technologies.

The circular economy is not just about adjustments aimed at reduction of negative impacts of the linear economy, it is a systemic shift that contributes to creation of long-term resilience of society and local communities to climate change and economic turmoil, generation of new business opportunities and jobs and has lasting positive effects on the environment and society.

4.2 EU approach to the circular economy

Although there are conflicting views on its reach and a significant number of criticisms, primarily due to a large number of definitions, the currently dominant view of the experts and the decision-makers alike at EU level is that the circular economy is able, in combination with new technologies, to several basic aspirations, in economy, it is capable of creating growth and jobs, and when it comes to environmental protection, it can reduce carbon footprint and have a positive impact on climate change.

Therefore, by adopting the EU Circular Economy Action Plan[5] at the end of 2015 and then the so-called European Circular Package[6] in 2018, the European Commission has set very ambitious targets for the Member States in terms of communal and packaging waste recycling, landfilling, source separation, extended producer responsibility, and food waste management. The estimates of the European Commission, as well as of independent researchers, are that interventions under these legislative instruments could have positive effects, both on the economy and employment, as well as on protection and improvement of the environment.

EU Circular Economy Action Plan envisaged 54 activities in various domains of economic activity within the European Union including the sectors of production, eco-design, consumption, waste management, secondary raw materials market. It foresees amendments to four regulations governing waste management. The revised Waste Legislative Framework, which entered into force in July 2018, has set clear targets for reducing the environmental impact of waste and guidelines for recycling and long-term waste management. The key elements of the revised Waste Management Framework are the objectives that the European Union, i.e. the Member States, must achieve between 2022 and 2035. These goals include:

- A common EU target for recycling 65% of municipal waste by 2035;
- A common EU target for recycling 70% of packaging waste by 2030;
- There are also recycling targets for specific packaging materials:
    - Paper and cardboard: 85 %
    - Ferrous metals: 80 %
    - Aluminum: 60 %
    - Glass: 75 %
    - Plastic: 55 %
    - Wood: 30 %
- A binding landfill target to reduce landfill to a maximum of 10% of municipal waste by 2035;
- Separate collection obligations are strengthened and extended to hazardous household waste (by end 2022), bio-waste (by end 2023), textiles (by end 2025).
- Minimum requirements are established for extended producer responsibility schemes to improve their governance and cost-efficiency.
- Prevention objectives are significantly reinforced, in particular, requiring Member States to take specific measures to tackle food waste and marine litter as a contribution to achieving EU commitments to the UN SDGs.

In addition to the directives governing waste management, the circular package also includes the Eco-Design Directive7, which sets minimum energy efficiency standards for products such as boilers, computers and household appliances. The aim of this Directive, which should be extended in the future at the initiative of the European Parliament to other aspects of products other than energy efficiency, such as longevity, susceptibility to repair, degradability and recyclability, is to reduce the environmental impact of different product categories.

Activities under the Action Plan related to the secondary raw materials market envisage the development of quality standards for secondary raw materials, especially for plastics, revision of fertilizer regulations, promotion of safe and cost-effective water use and drafting of legislation setting minimum requirements for reuse of water. Consumer-related activities are extensive and address issues such as the better implementation of existing product warranty regulations, innovating anti-fraud business practices, making requests for product repair information in the context of eco-design, improving efficiency eco-labeling and other activities. Within the Action Plan, there are also specific activities foreseen relate to European strategies in the field of

5 Closing the loop—An EU action plan for the Circular Economy COM/2015/06

6 Commission Communication COM(2015)614 final "Closing the loop—An EU action plan for the Circular Economy"

7 Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of eco-design requirements for energy-related products

plastics and plastic materials, food waste, construction and construction waste, biomass and biomaterials, innovation and investment, critical raw materials and monitoring.

Given the European Union's commitment to meeting the Sustainable Development Goals (SDGs), as well as its strategic commitment to the circular economy, as one of the main instruments for achieving the Goals, and in particular SDG 12—Ensuring sustainable consumption and production patterns, it is certain that European legislation will be further developed and refined in the forthcoming period towards the introduction of the circularity principle in all spheres of economic activity, especially in related to consumption, design and product life cycle.

4.3 EU Circular Economy Monitoring Framework

In the wake of adopting a circular economy package, the European Commission has also established a framework for monitoring progress in this area. This monitoring framework consists of 10 indicators8 in four different fields. Some of the indicators are broken-down to sub-indicators.

1) **Production and consumption (this area comprises 4 indicators):**

- Self-sufficiency of raw materials for production in the EU;
- Green public procurement (as an indicator for financing aspects);
- Waste generation (as an indicator for consumption aspects);
- Food waste.

2) **Waste management (this area comprises 2 indicators):**

- Recycling rates (the share of waste which is recycled);
- Specific waste streams (packaging waste, biowaste, e-waste, etc.).

3) **Secondary raw materials (this area comprises 2 indicators):**

- Contribution of recycled materials to raw materials demand;
- Trade of recyclable raw materials between the EU Member States and with the rest of the world.

4) **Competitiveness and innovation (this area comprises 2 indicators):**

- Private investments, jobs, and gross value added;
- Patents related to recycling and secondary raw materials as a proxy for innovation.

Since the circular economy is a concept that aims to decouple the use of natural resources from economic growth and pervades all segments of economic activity from the exploitation of natural resources to the final disposal of products, indicators have to follow all segments of this cycle.

In this respect monitoring the production and consumption phase is essential for understanding progress towards the circular economy. The amount of waste generated should be decreased in both the domestic and sector of the economy, thus in the longer-term contributing to an increase in the self-sufficiency of the economy in the country, region or EU. Recycling is an important part of the circular economy so its progress is monitored. This group of indicators focuses on the share of waste which is recycled and returned into the economic cycle to continue creating value. Furthermore, to close the loop, material and products need to be re-introduced into the economy, for example in the form of new materials or products. Finally, these indicators also follow other segments of economic activities like investments into circular economy and level of innovation.

4.4 Circular Economy in NALAS Member Countries

Circular economics is one of the main topics for European policymakers, especially when it comes to environmental protection, economic development, and overall social prosperity. However, it seems that there is a commonly accepted view among experts and practitioners that the circular economy in the majority of SEE countries except for Slovenia is still a relatively new, unknown, unpromoted and low priority topic. This statement can be applied to all major social groups like creators of public policies, political decision-makers, businesses, and citizens. Such an observation is even more valid at the local level of governance.

Based on this assumption and in line with NALAS strategic commitment to promote EU values toward its members and through them even further to 9000 local self-government units in Southeast Europe, 2018 edition of Benchmarking on Solid Waste Management Report was expended with the part on circular economy with the idea to accomplish several

8 https://ec.europa.eu/eurostat/web/circular-economy/indicators

objectives. Firstly, by documenting the views of the member associations representatives the claim about low priority and poor understanding of the circular economy in SEE countries was to be confirmed or denied. Then, and even more important, purpose of the Report is to bring closer the idea of circular economy to NALAS members and local governments in Southeast Europe, but also to contribute to raising awareness about circular approach as an instrument for sustainable local economic development and to show advantages, drivers and benefits, but also barriers to more rapid and extensive transitions towards circular economy at the local level.

The methodological approach taken to achieve these objectives included short desktop research on circular economy principles but also a basic survey among NALAS member associations representatives regarding the implementation of the circular economy approach in their respective countries.

4.5 Opinion Analysis on Circular Economy of the NALAS TF Members

As part of the Benchmarking Report an opinion analysis about basic viewpoints on the topic of the circular economy, like process drivers and barriers or the awareness levels of major groups of actors, was performed among NALAS TF SW and WM members. Opinion analysis was based on a questionnaire consisting of nine questions, out of which six were multiple choice type and three asked survey participants to provide written explanations. Ten associations out of fourteen NALAS members participated in the survey representing the situation in nine countries of the SEE region. Answers were not received from Bulgaria and Slovenia which should not be considered as a major setback since those are EU member states and are more advanced and have a more strict obligation to closely follow European standards including those from the circular economy package. Slovenia is particularly advanced regarding the strategic orientation towards the circular economy, being one of the first EU countries to adopt National Circular Economy Road Map in 2018 and with Municipality of Maribor and its Strategy for the Transition to Circular Economy even before that.

Based on the conducted analysis of the answers received, it is possible to make basic observations and assumptions about the local experts and associations representative's viewpoints of circular economy concept and its applicability in their respective countries as well as on their understanding of the possibilities and advantages provided by this concept.

Although analysis gives subjective insights and paints a picture based on the opinion of local experts about the status of circular economy in the region of South-East Europe, it still can be used as a starting point for further research or provide ideas for the development of the potential regional project. Combined with further research and analytical work it can even be a basis for NALAS member associations policy work.

The first question that was posed was about sector or sectors where the circular economy is most likely to be mainstreamed either on the country or lower level of governance. Being the multiple-choice question, participants in the survey were offered the following sectors to choose from: Packaging waste; Food waste and agriculture; Special waste streams; Electric and electronic waste; and Shared economy. The option of adding other sectors was also offered. Participants were asked to give a rating for each sector from 1 to 5 (with 1 being the best grade). The answer to this question was received from nine associations. Association of Kosovo Municipalities did not provide an answer to this question. Results show that the sector of packaging waste received the best score (with an average rank of 1,44) meaning that NALAS members perceive this sector as the best for introducing and mainstreaming circular economy principles. After this one, three sectors follow with very close grades, electric and electronic waste (2,44), food and agriculture (3,0) and special waste streams (3,11). The sector with the worst ranking is a shared economy (4,22). This can partly be explained by the fact that as a term shared economy is still not very common. The sharing economy as part of the circular model is approach defined as a peer-to-peer based activity of acquiring, providing, or sharing access to goods and services that are often facilitated by a community based online platforms. Finally, one of the participating associations rated "other sector" as well but did not specify which indicating that there are more specific activities where the circular economy can be mainstreamed. The results of the analysis of this question are presented in chart 1.

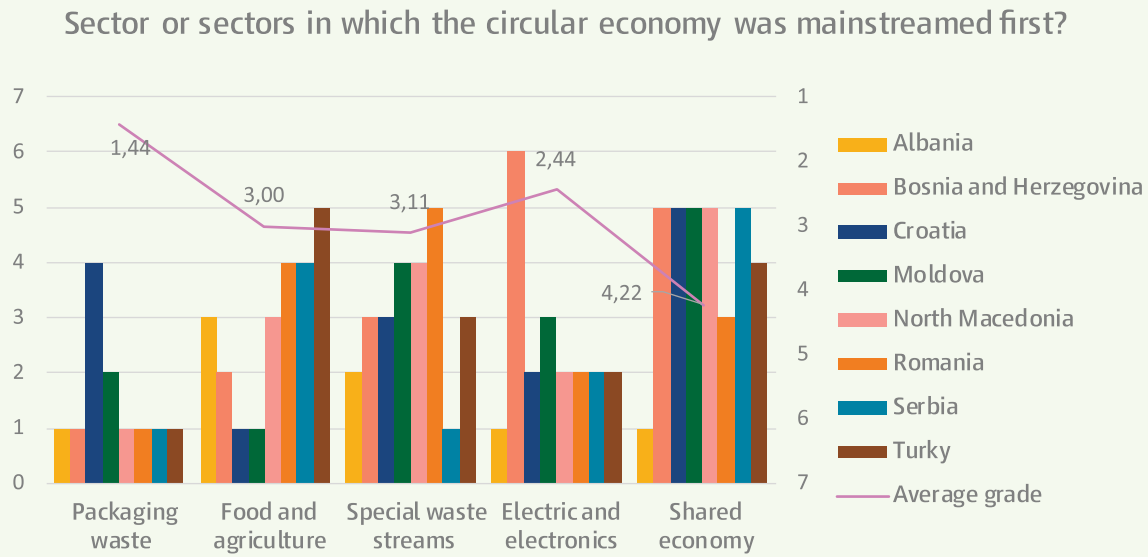


Chart 1. Sectors in which circular economy is likely to be mainstreamed

The next question was about main drivers, motivating factors or legal requirements, for the circular economy in the countries of the SEE region. This was also a multiple-choice question with six given options starting from sustainability and environmental protection and including also waste reduction, recycling and landfilling avoiding, new business models i.e. profit, job opportunities and job creation, EU standards and finally regulation through legal activities.

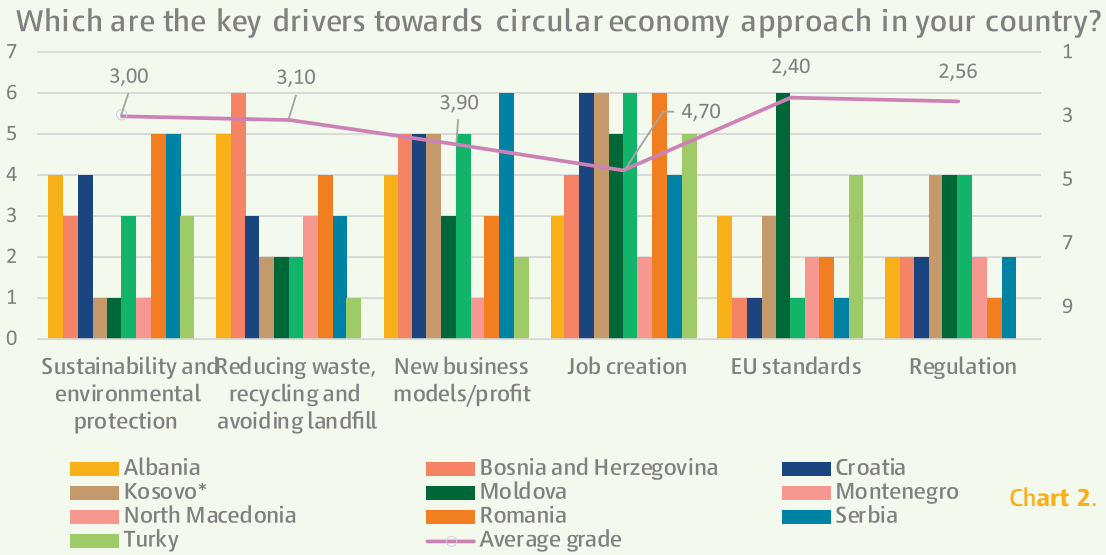


Chart 2. Main drivers for circular economy in SEE countries

Ten answers were received to this question from participating associations. EU standards are perceived as the main driving force for the circular economy with an overall grade of 2,40 followed by regulation (2,56) and considerations about sustainability and environmental protection (3,0). Waste reduction, recycling and avoiding landfilling is also considered as an important driver with an average grade of 3,10. Economic drivers i.e. new business models and job creation are considered as a bit less important wit grades of 3,90 and 4,70. The results of the analysis of the question about the drivers are given in chart 2. Such results show that in SEE countries public sector is perceived as one that has to push in the direction of circular economy and that the business sector needs to be educated so it can recognize new opportunities for business development and profit.

The following question was about the main stakeholder groups in SEE countries and their role as drivers of circular economy transition. Participating associations could give grades from 1 to 5 to nine offered stakeholder groups. Groups that were offered were: Central government; Regional government; Local government; Public utility companies; Large companies; Small and medium-sized enterprises; Civil sector; Academia and scientific institutions; and Citizens. Nine associations answered this question. In the analysis of the responses, some interruptions can be observed which is since in some countries there is no regional tier of governance which made this option not applicable to those specific cases.

The analysis shows that in SEE region central government is seen as the major stakeholder when it comes to pushing the transition to circular economy forward. This stakeholder group received a grade of 1,90 while the two following groups are big companies and SMEs both with a ranking of 2,11. Such scoring can look contradictory compared to responses to previous questions but show that the private or business sector is perceived as very important and therefore requires special attention in terms of education programs and awareness-raising campaigns as well as some other incentives that can be provided by central or local governments.

Local governments and the civil sector follow with a rating of 2,60 and 2,70. Somewhat less important groups for driving the transition to the circular economy based on the responses from participating associations are public utility companies (3,10), citizens (3,25), and academic and scientific institutions (3,30). Finally, as explained previously regional governments are seen as stakeholder groups with lest importance for the circular transition process (4,0). Analysis of the responses to this question is presented in chart 3.

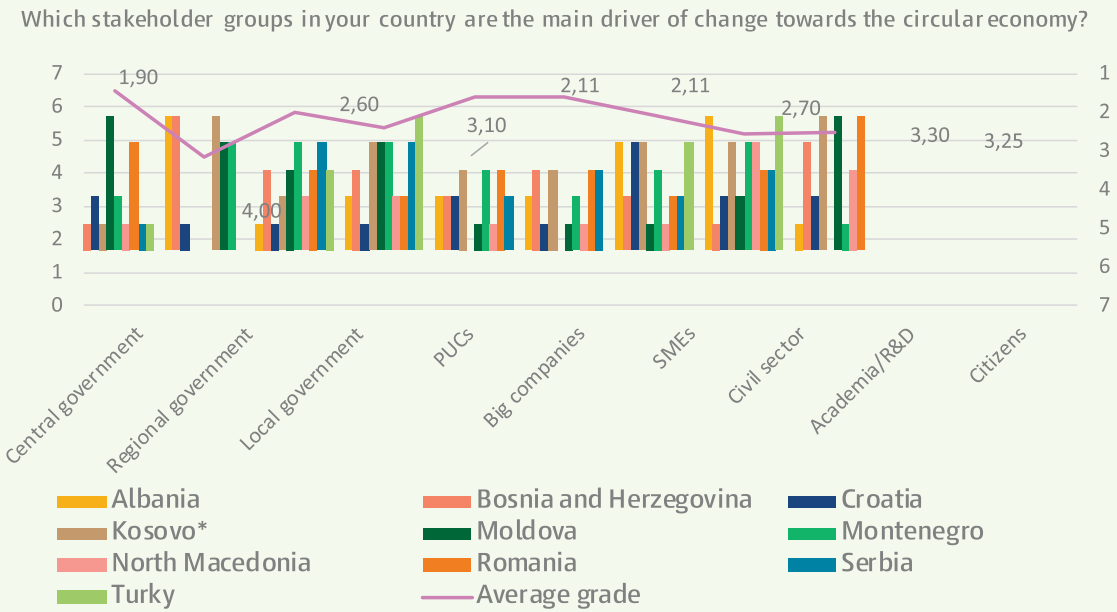


Chart 3. Stakeholder groups as a driver of transition towards

The fourth question was about barriers that can prevent a faster transition to the circular economy. Options in this respect offered to participants in the survey included legal, economic, financial, administrative and barriers related to the level of awareness of stakeholder groups. Ten associations responded and although all predefined barriers received pretty uniformed grades there are two that were seen as major hurdles to circular economy transition.

Legal issues with 2,50 rating, or better yet the absence of term of circular economy in legal acts of countries in the region is seen as a major problem. Although some principles or parts of principles of the circular economy can be found in certain legislation or strategic documents in the region it seems that only precise mentioning of the term and specific obligations and targets set by the laws can enable a faster transition towards the circular economy. This conclusion is for NALAS consideration to try to formulate policies that would help national associations to advocate for the improvement of legal systems in this respect.

Other high ranked barriers are the level of awareness and lack of financial mechanisms with a 2,90 mark. Since associations are in a position to influence awareness by implementing projects and campaigns this can be a good argument for a joint regional approach. Other barriers are closely following with ratings as follows economic barriers (3,0) and administrative barriers (3,70) as shown in chart 4.

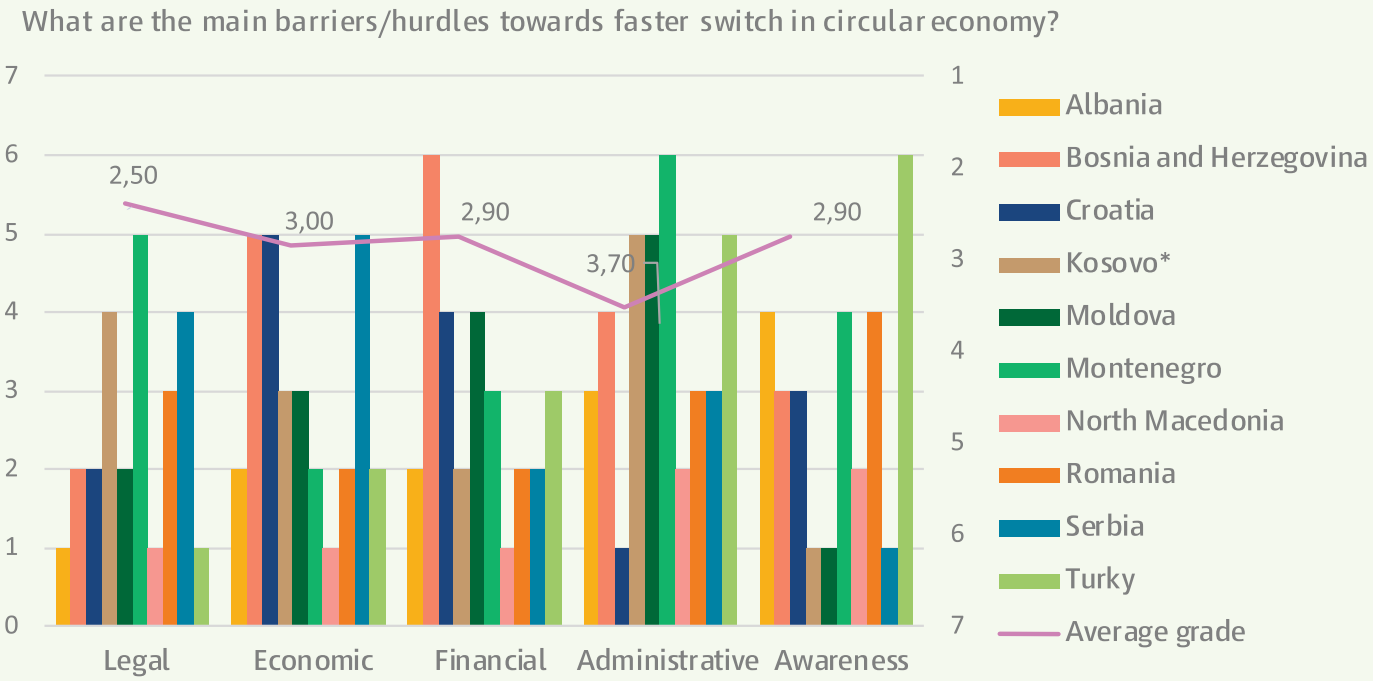


Chart 4. Barriers for circular economy in SEE countries

The following two questions were about the level of knowledge or awareness of different stakeholder groups about EU circular policies and circular economy principles. For both questions, the same groups of actors were given as options: decision-makers at the national level; decision-makers at the regional level; decision-makers at the local level; Public utility companies; general population; big private companies; small and medium enterprises; and civil sector. Ten associations responded to this question.

Analysis of question-related to awareness about EU circular policies is given in chart 5. It shows that the civil sector and decision-makers at the national level with a ranking of 2,50 are best informed about EU policies. This group is followed by SMEs with a rating of 2,70. Other groups follow big private companies with 3,30 ranking, decision-maker at the local level with 3,40 grade, public utility companies (3,70), decision-makers at regional level (3,71), finishing with the general population (with the lowest grade of 4,10). Since the participation of citizens and changing their habits as customers is crucially important for the success of the circular economy it is necessary to think about campaigns towards the general public in SEE countries.

The last multiple-choice question was about finding out about awareness levels of stakeholders on the basic principles of the circular economy. As seen in chart 6 it seems that SMEs and national level with rankings of 2,50 and 2,60 are best informed about the circular economy in general. Other groups of actors that are fairly informed include the civil sector (2,63), and big private companies (2,80). The group of stakeholders that can be considered less informed consists of decision-makers at the local level (3,10), public utility companies (3,30), regional level representatives (4,0), and the general public (4,30).

The circular economy part of the Benchmarking Report ends with questions about existing financial mechanisms that support the transition towards the circular economy, promotional activities in the countries of the region, and concrete examples of applied circular economy principles.

Although there are some initiatives at the level of national governments most activities related to the circular economy are implemented with the support or in the scope of internationally funded projects as presented in the Country Review part of the Benchmarking Report.

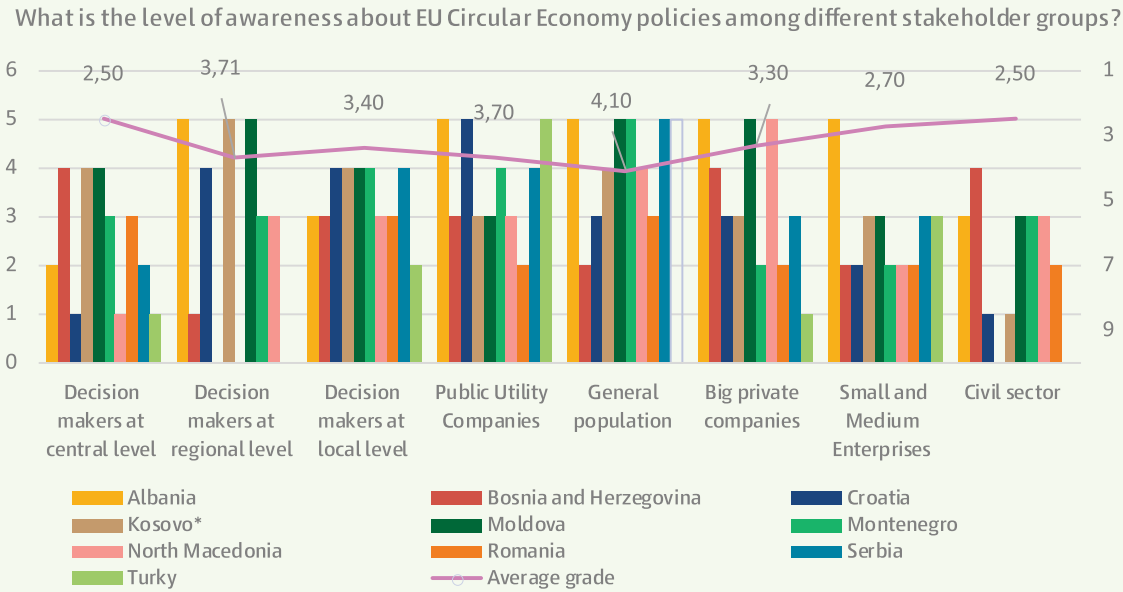


Chart 5. Awareness level about circular economy among main stakeholder groups in SEE countries

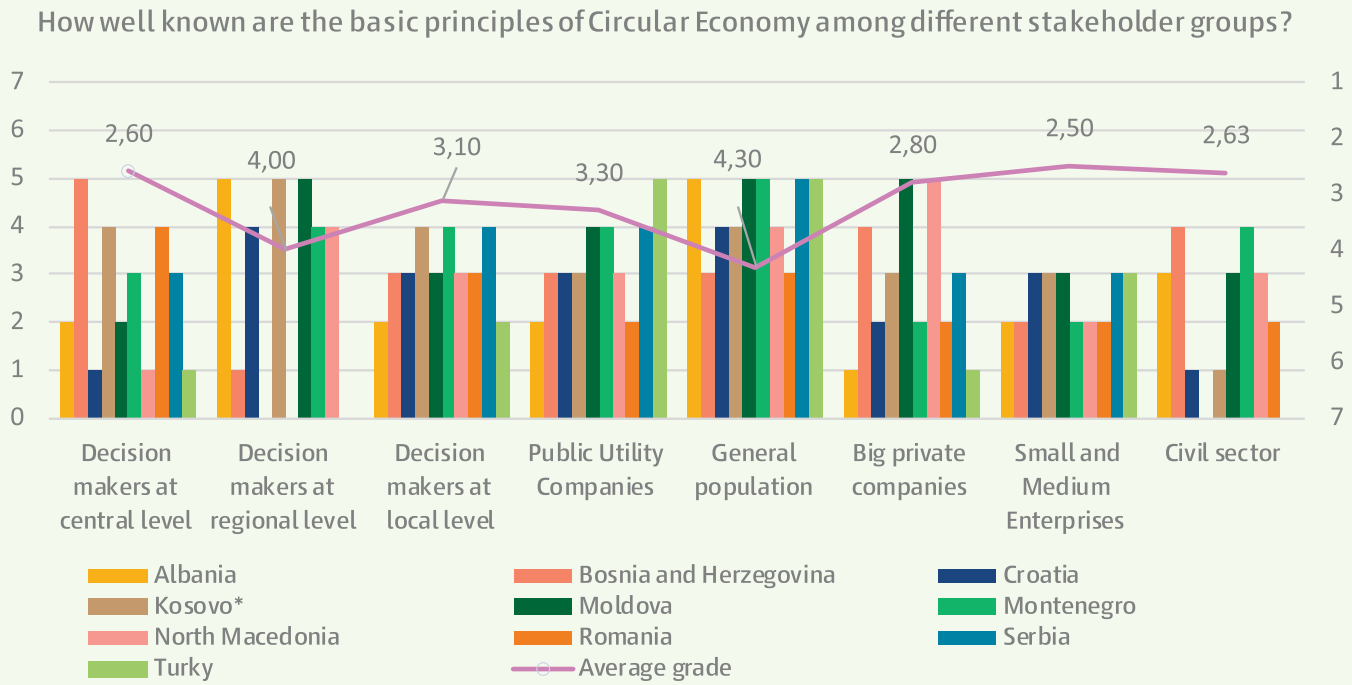


Chart 6. Basic knowledge about circular economy principals of the main stakeholder groups in SEE countries

5. BENCHMARKING OF NATIONAL INDICATORS

5.1 Indicator 1: Population

This year's report is based on data received from TF members, representatives of 11 countries of SEE. There are no data from Bulgaria and Slovenia; however, some of the data available on the open-source database are shown in the tables. The first indicator provides information on the total population that generates waste and that should be included in waste collection services. The main purpose of this indicator is to calculate the values of other indicators such as waste generation, coverage, etc. Data used to describe this indicator is taken from the submitted questionnaires and double-checked with the information available online at the web sites of national Agencies for statistics and/or EUROSTAT.

As shown in the graph, Montenegro is the least populated and Turkey the most populated country in the SEE region. Other countries have a similar population size, which also makes them easily comparable in terms of solid waste benchmarking.

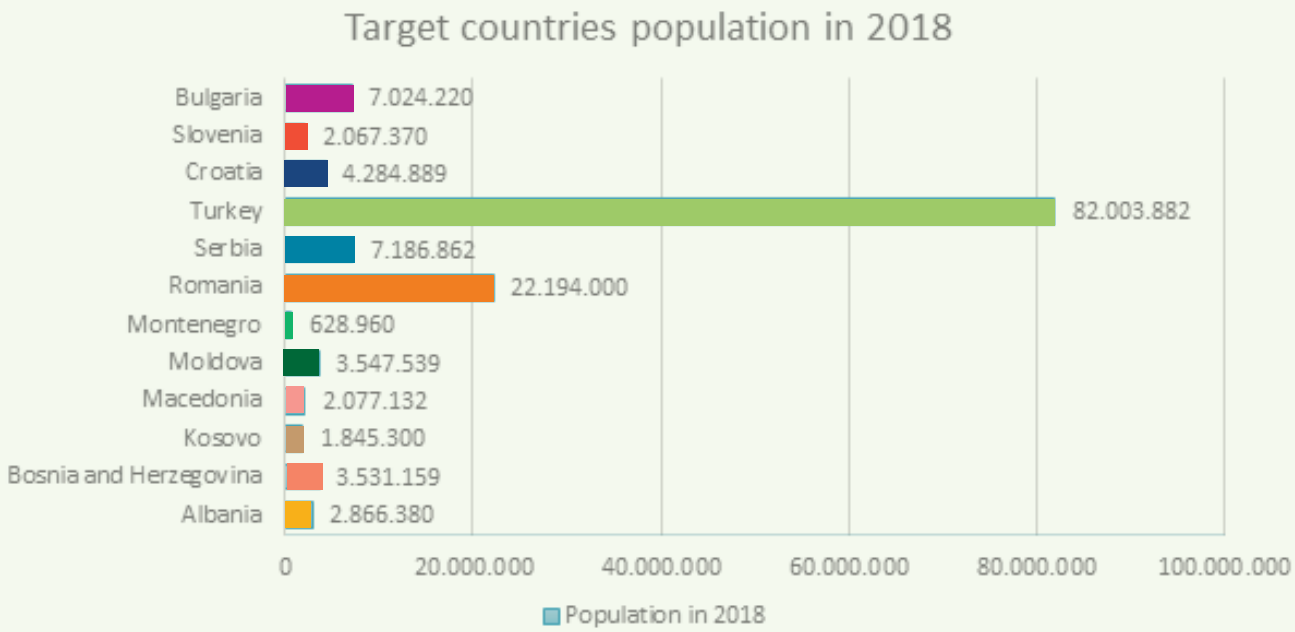


Chart 7. Target countries population in 2018

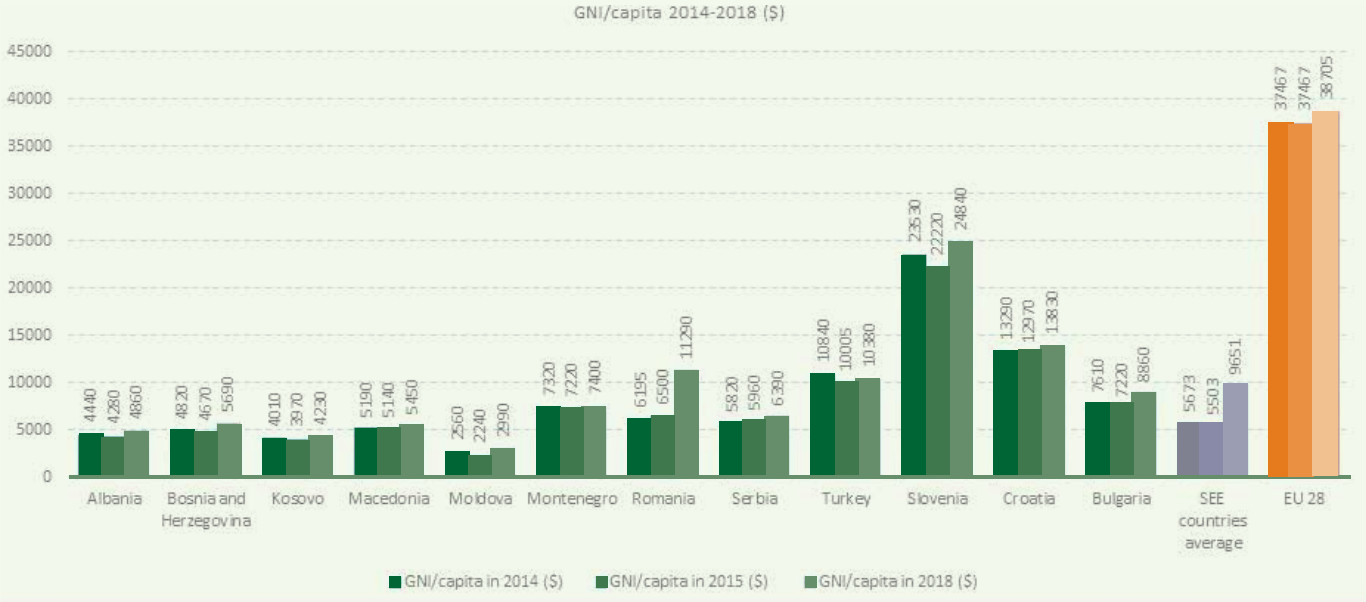
5.2 Indicator 2: Country income level

It is a general understanding that an increase in development level, coupled with income level (GNI/capita), is followed by an increase in waste generation. Adequate waste generation infrastructure should have the same trend if managed properly.

Notably, SEE countries which are also EU countries have a larger income level per capita. Slovenia (24.840 $) being the leading one. Slovenia is also only NALAS country whose GNI/capita is close to the EU average, and more than double of SEE average. If compared with the EU28, the GNI of the SEE countries clearly shows the unfavorable economic situation in the region. The EU28 average is four times higher than the average GNI of SEE countries.

Comparing the 2015-2018 period it is notable that all countries have income levels increased, however, it is still far behind the EU 28 average. Unlike the last reporting year 2015, GNI/capita has increased even compared to the 2014 year which indicated stronger economic development in the region.

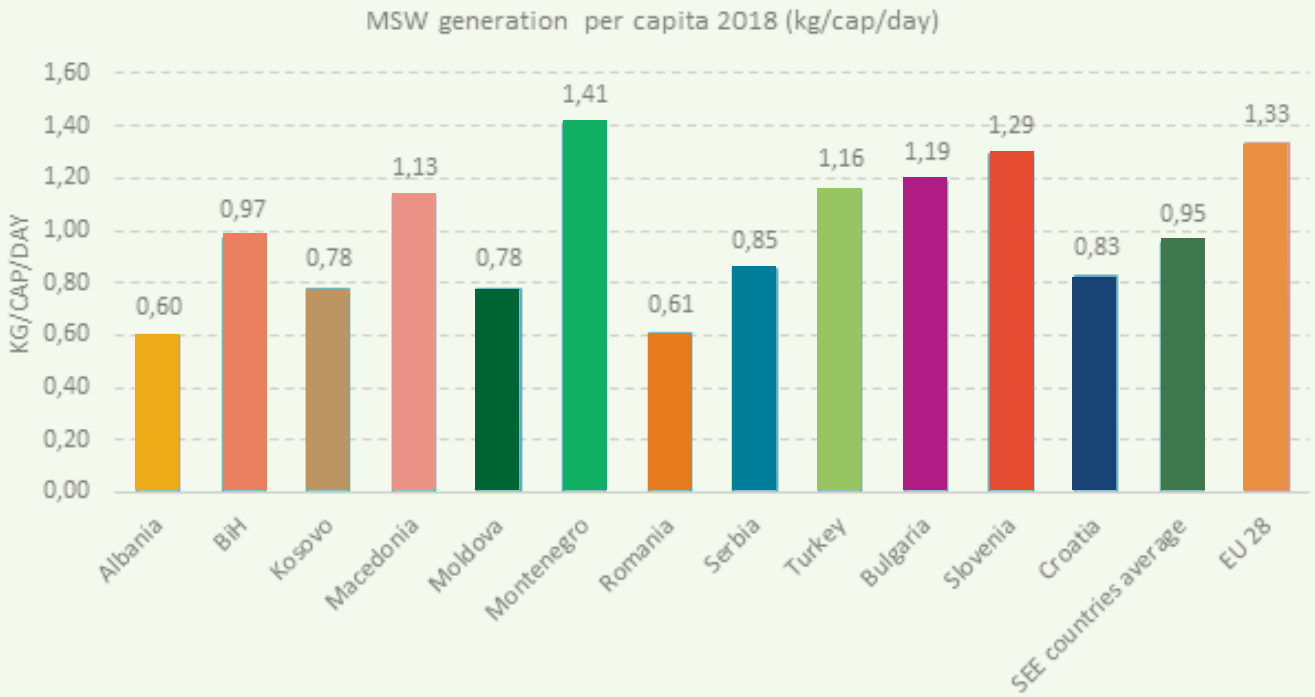
Chart 8. GNI/capita for the SEE countries (2014-2015 -2018)



5.3 Indicator 3: Municipal solid waste generation per capita

Municipal solid waste generation per capita expressed in kilograms per day is one of the most common indicators used in describe management in the waste sector. Tracking this indicator over time is crucial for waste management planning, the effectiveness of the system and the basis for waste prevention.

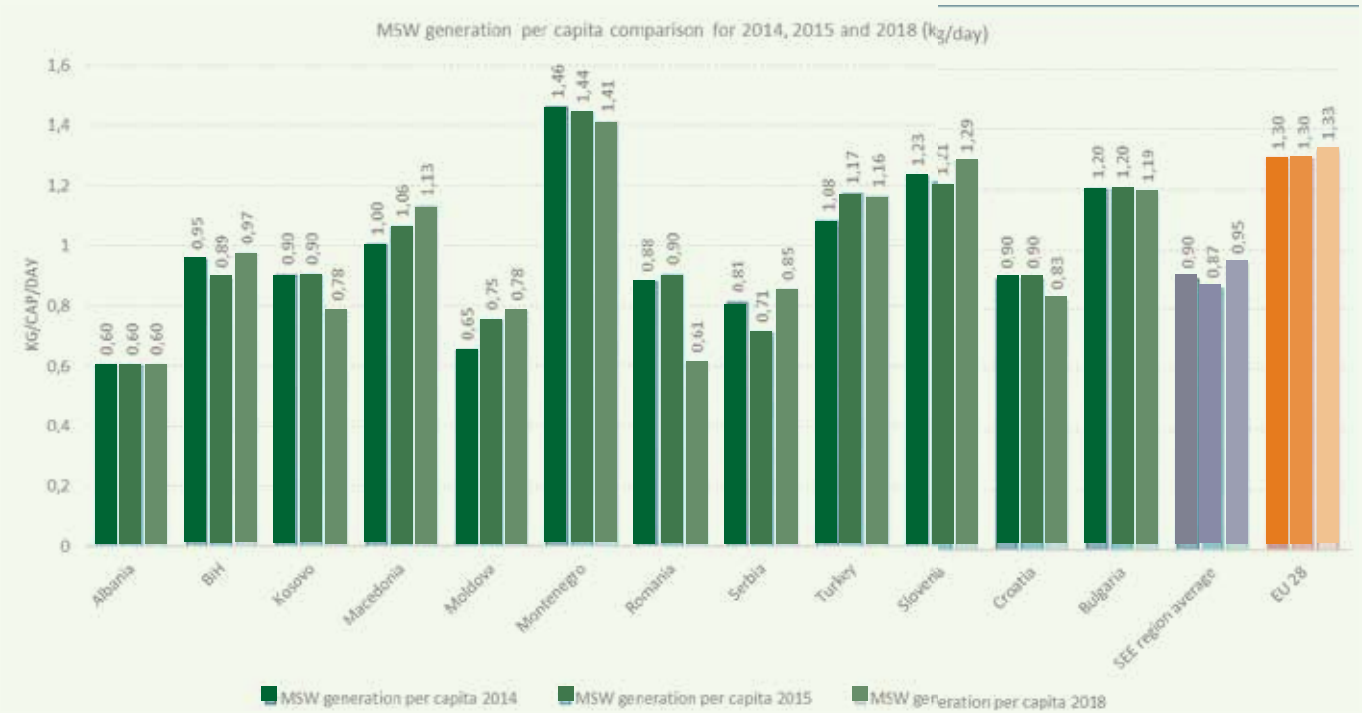
Chart 9. Municipal solid waste generation per capita



The benchmark values for waste generation indicator is EU 28 average and SEE countries average. 11 out of 12 countries observed have less waste production than the EU 28 average, except for Montenegro whose waste production per capita is the biggest (1,41 kg/cap/day). Half of the reported countries have their waste generation below the SEE average (e.g. Albania, Kosovo, Moldova, Romania, Serbia, and Croatia). The least waste per inhabitant is produced in Albania 0.6 kg/capita/day. The average municipal solid waste generation in SEE countries is 0.95 kg/capita/day and it is lower than the EU28 average. Data for EU28 and SEE waste generation per capita is taken from the EUROSTAT database for the last available year 2017.

Comparing waste generation per capita indicator through reporting years 2014, 2015 and 2018, it is visible that there is no pattern. Albania is the only country with no changes in waste productions over the years. Kosovo, Montenegro, Romania, Bulgaria, and Croatia have reported a decreasing trend in the observed period, while Macedonia and Moldova have a constant increase in waste production. Other countries have reported oscillation over time, with the highest values for the 2018 year.

Chart 10. Comparison of waste generation in target countries (2014 – 2015 – 2018)



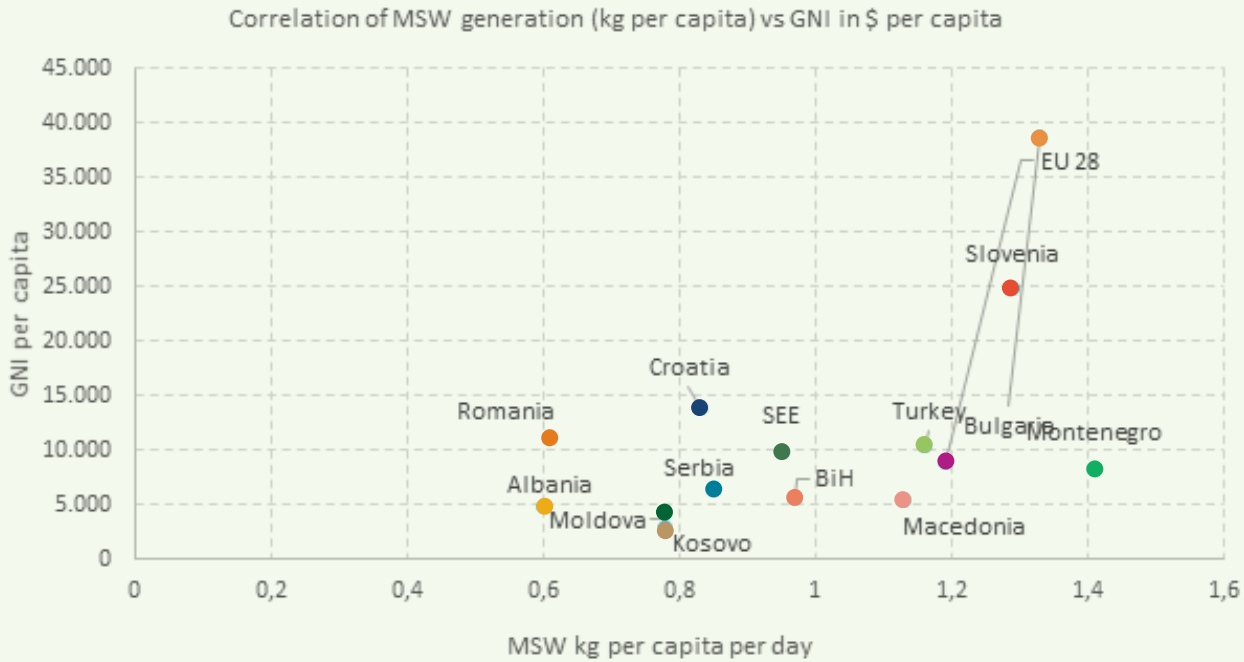


Chart 11. Correlation of MSW generation and GNI in target countries

GNI per capita as an indicator for income level representing economic development in the target country coupled with MSW generation per capita, shown in Chart 11, explains the correlation between economic status and waste production. It can be seen that countries with GNI per capita higher than 10,000 $ have waste production in the range of 0,8 -1,3 kg/cap/day. On the other side countries with GNI per capita below 6,000$ have waste products in the range from 0,6 to 1 kg/cap/day. Out of target countries, Slovenia has GNI per capita 2,5 times higher than SEE average with waste production higher for more than 30%. The outliner is Montenegro with GNI per capita little below SEE average but with high waste production per capita, higher than the EU 28 average.

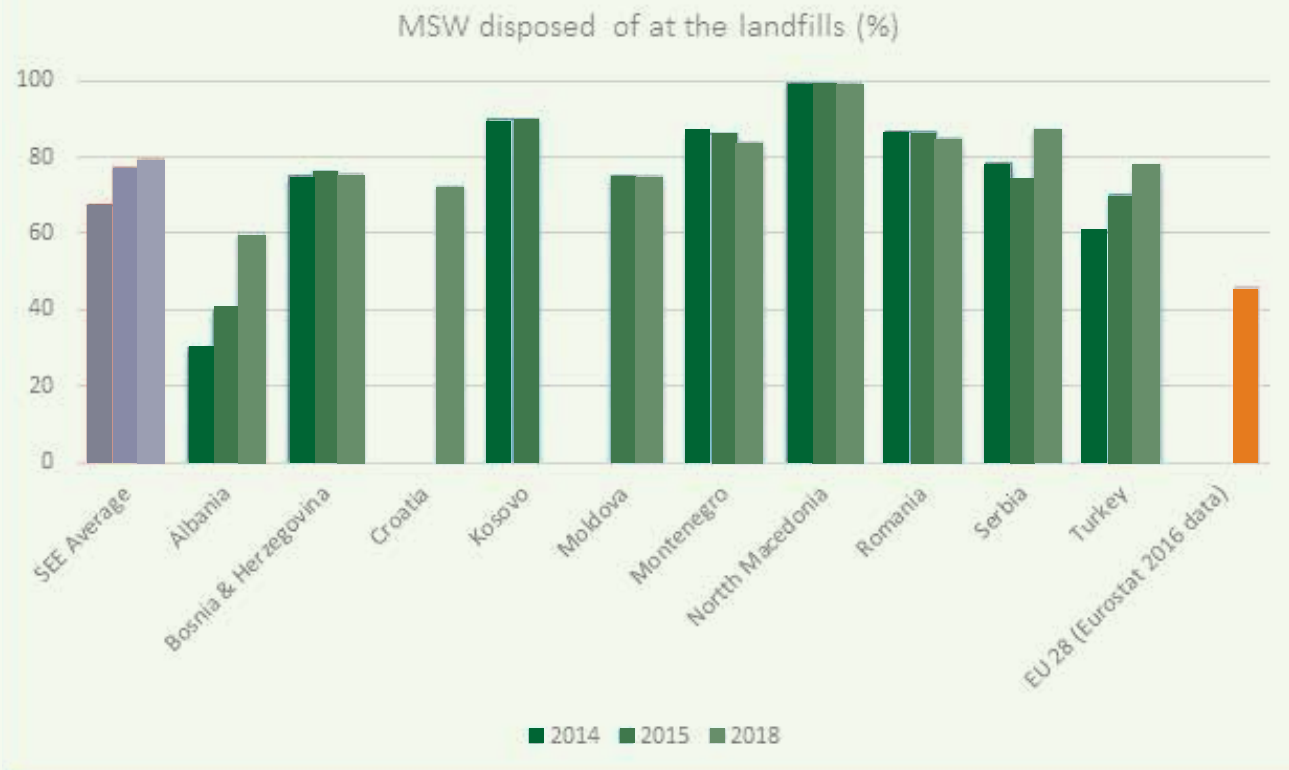
It is evident that GNI per capita on average has increased around 20% in total for target countries since the last reporting period, however average waste production per capita mainly remained steady in the period 2014 to 2018. A deeper analysis of the data collection and presentation in the countries of the region noticed phenomena can be explained by inconsistencies in reporting and poor data quality. In the earlier years, most of the target countries did not have legal obligations nor instruments in place for waste measurements and reporting resulting in submitted data being provided based on approximations. Only recently adequate instruments and practices are being implemented and data on waste generation is more accurate. Such a situation has made some problems to many countries, for example, Croatia, as EU member country, implements significant measures for waste reduction, but since the reference year for them is 1997 when waste quantities data were given upon approximation, they are officially struggling with waste reduction in generation. Upon this realization, it can be concluded that economic development and waste generation are still coupled in the target countries and that more effort should be put into shifting national economies towards the circular economy.

5.4 Indicator 4: Waste treatment

The indicator of waste treatment mainly has a purpose in determining different waste treating options in the region and comparison between countries. Several options were available to choose regarding waste treatment: disposal at the landfills or landfilling, biological treatment, thermal treatment of waste, MBT treatment, and illegal dumping. Data presented in the country reviews and the charts below are a combination of those from questionnaires received from national experts and Eurostat[9], which in some cases result in inconsistencies regarding the total percentage of waste treatment.

Even though all national and EU legislation envisages and encourages every option of waste treatment over landfilling, still it is the most represented practice in the Southeast Europe region.

The structure of waste treating options for each country over reporting periods are almost the same, but the percentages are changing. Tree main categories are present: landfilling, illegal dumping and reducing/recycling of waste. Biological treatment of MSW is present in Romania and Croatia, and Turkey and Bosnia and Herzegovina but in a very small percentage of less than 1%. Romania and Croatia are only countries where thermal treating of waste is implemented. While there is a significant percentage of 10% thermal treating of waste in Romania, only 0,05% is thermally treated in Croatia. Unfortunately, all countries have reported an increase in the disposal of waste at landfills. Still, this development can be seen as partially positive since it is at the expense of illegal dumping of waste which is decreasing in the same amounts. The only exception is Montenegro where landfilling and illegal dumping both decreased but in very small amounts. This could be explained in more precise data collection rather than regression in waste treating.



9 https://ec.europa.eu/eurostat/web/products-datasets/product?code=sdg_11_60

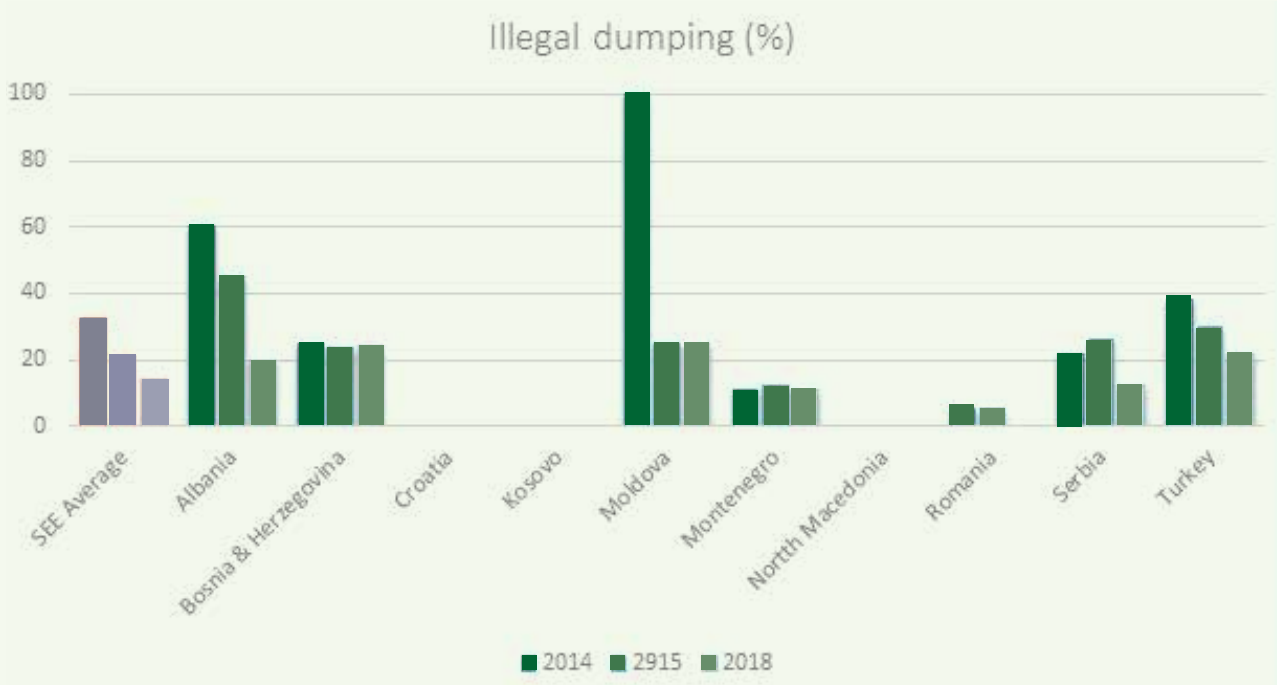
Chart 12. Comparison of waste options in target countries (2014 – 2015 – 2018)

Unfortunately, in this year's report, there is no data available for waste treatment in Kosovo as well as for illegal dumping for North Macedonia.

Both in Turkey and Albania, the amount of waste landfilled has increased at the same time decreasing the amount of waste dumped at illegal open dumps by 10% to 20%.

The greatest effort in the SEE region over the reporting period have been made in controlling waste disposing and reducing illegal dumping. However, the overall percentage for illegal dumping, a practice that is not allowed and present in the EU, in the region counts for close to 15%. At the same time landfilling remains the primary option for the waste disposing of with approximately 79% average for the region. Small efforts in other waste treatments as well as recycling are notable but still far from EU standards. Lack of finances and adequate infrastructure in the region prevents other options to have a more significant part in waste treatment.

Chart 13. Recycling rate comparison (2014 – 2015 – 2018)



5.5 Indicator 5: Recycling rate

The recycling rate in the context of this report is the percentage of recyclables that are collected and recycled divided by the total amount of generated recyclables. In Eurostat terminology, this indicator is called Recycling rates for packaging waste[10] and means the total quantity of recycled packaging waste, divided by the total quantity of generated packaging waste. Eurostat provides 2017 data for this indicator for EU member states including Bulgaria, Croatia, Romania, and Slovenia but not for other countries covered in the Report. Still, for this Report, in both country reviews and chart 13, Eurostat data was used for mentioned countries and the rest was taken from national questionnaires.

The region is still struggling with recycling although the majority of countries are showing upward trends. There is no data for recycling reported for Kosovo, however, it can be assumed that the recycling rate isn't zero since data is reported for municipalities of Gjakova/Djakovica. The recycling rate in B&H has a decreasing trend from 14% in 2014 and 10% in 2015, to 7% in this year's report. The recycling rate in Albania has a similar level as in 2015, but it is still less than half from 2014. From the experience in the region, it is more likely that data for 2014 were given upon assumption while data for 2015 and 2018 are more precise. For Serbia, there was no data in the last two reports. However, Serbian Environmental Agency has published reports for recycling packaging waste recently so this year's report contains data for the period 2014-2018. The greatest improvement is reported in Montenegro where the recycling rate almost tripled. Overall Slovenia is still

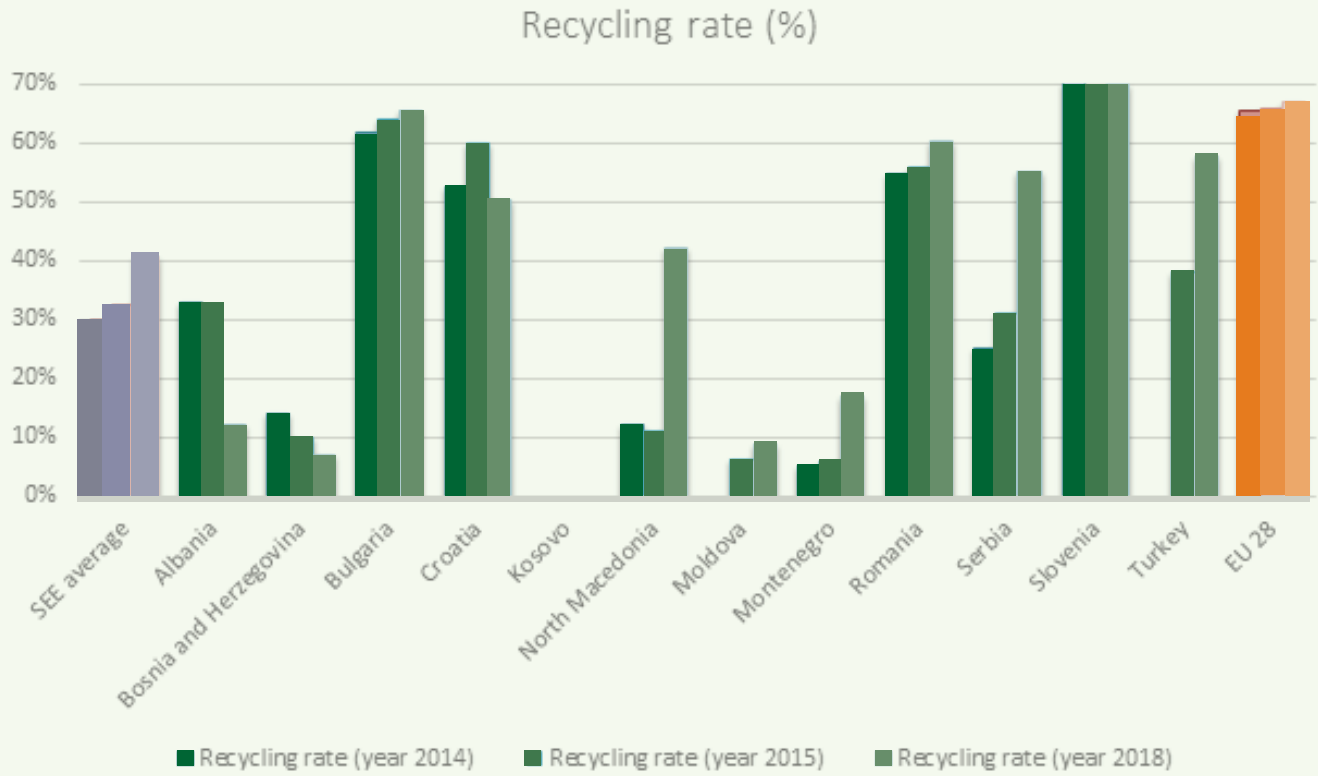


Chart 14. Waste recovery by recycling

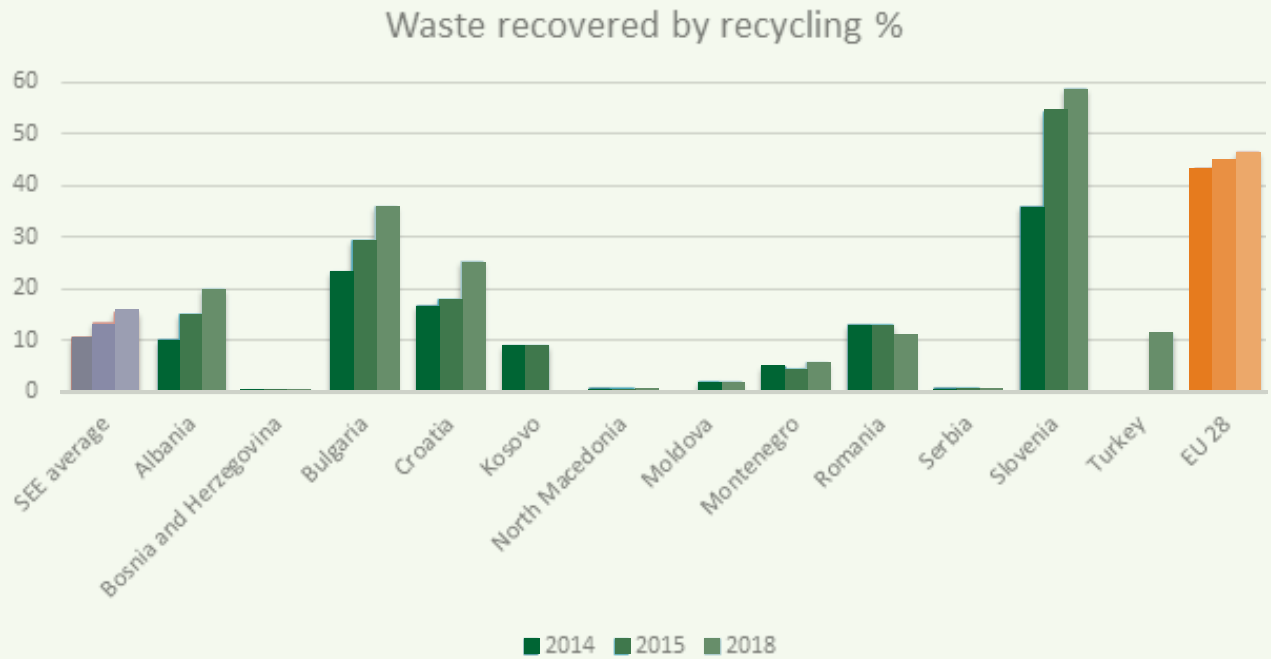
10 https://ec.europa.eu/eurostat/web/products-datasets/product?code=ten00063

leading in the region with a recycling rate of 70,1% followed by Bulgaria (65,6%), Romania (60,4), Turkey (57,8%), Serbia (55,3%) and Croatia (50,5%). All other countries have a recycling rate of less than 20% indicating insufficient efforts in waste reduction. Overall, with 38,05% rate region is lacking behind the EU average for 2017 of 67,0% which was reported in the Eurostat database.

Another indicator that treats waste reduction which is also monitored in the Eurostat database is the recycling rate for municipal waste[11] (in this Report referred to as Waste Recovered by Recycling). Waste recovered by recycling is the percentage of waste recycled out of total municipal waste. These two indicators are commonly mixed in reporting practice and this explains some discrepancies in data submitted by TF members and those in Eurostat. Furthermore, in some national statistics, like in Serbia, there is no data on waste recovered by recycling so the information provided is given as unofficial based on the best estimate.

Unfortunately, not all target countries have reported their data to EUROSTAT and therefore a combination of a source of data for this indicator could give different interpretations. EU 28 average reported in Eurostat for 2018 is 47,0%[12]. Same database show that other countries in the region have following recycling rate for municipal waste in 2018: Slovenia (58,9%), Bulgaria (36,0%), Croatia (25,3%), Turkey (11,5%), Romania (11,1%), Montenegro (5,5%) and Serbia (0,3%). Despite a very high percentage in Slovenia, the overall recycling rate for municipal waste in the region is three times smaller than the EU28 average. Data for Albania (20%), provided from the questionnaire, is extremely high compared to Romania (11,1%) and Croatia (25,3%), both EU countries and assumingly advanced in waste management. Nevertheless, this indicator shows that our target countries are still far beyond the EU28 average and therefore waste management practices in the EU. Since landfilling is a major waste disposal option and with small efforts in determining waste morphology, low recovery of waste is not a surprise.

Chart 15. Waste recovery by recycling



11 https://ec.europa.eu/eurostat/web/products-datasets/product?code=cei_wm011

12https://ec.europa.eu/eurostat/web/products-datasets/product?code=sdg_11_60

5.6 Indicator 6: Land disposal sites for solid waste

Considering the region practices and keeping in mind that landfilling of municipal solid waste is still a most preferable option, this report track changes in the number of sanitary landfills, non-compliant municipal landfills and illegal dumpsites.

This report also took into consideration the existence of landfills for inert waste, having in mind that the construction and operation of these landfills is the obligation of local governments.

	ALB	B&H	HRV	KOS	MKD	MDA	MNE	ROU	SRB	TUR
Sanitary regional landfill	3	7	2	7	1	0	2	37	11	73
Non-compliant municipal landfill	80	84	98	4	54	1147	15	10	123	n/a
Illegal dumpsite	11	Approx. 834	n/a	2529	Approx. 1100	850	Approx. 158	0	1711	n/a
Landfill for inert waste	0	1	n/a	0	0	0	2	0	n/a	4

Table 15. Data on landfills in targeted countries

Even though the period of three years since the last 2015 report has been published, small improvements in municipal waste management infrastructure have been made. Turkey, Serbia, B&H, and Kosovo have more sanitary landfills but still insufficient considering their population. Moldova is still the only country where all municipal waste is either deposited on non-compliant landfills or illegal dumpsites. Moldova is also the country where a large number of non-compliant landfills have been reported (1147). The explanation for this phenomenon that more than one site per municipality for waste disposal has municipal approval. These sites are most likely to be dumpsites, but with official approval. Insufficient waste management infrastructure and an especially small number of sanitary landfills could be explained by low economic development in the region but mostly due to lack of finance. More preferable options are non-compliant landfills, especially for Macedonia and Montenegro who increased these numbers.

The data also shows an extremely high number of illegal dumpsites in the region, with some countries reporting even higher numbers than in 2015 (e.g. B&H, Kosovo, Macedonia). It can be concluded that still majority of municipal solid waste is disposed of on non-compliant landfills and illegal dumping sites.

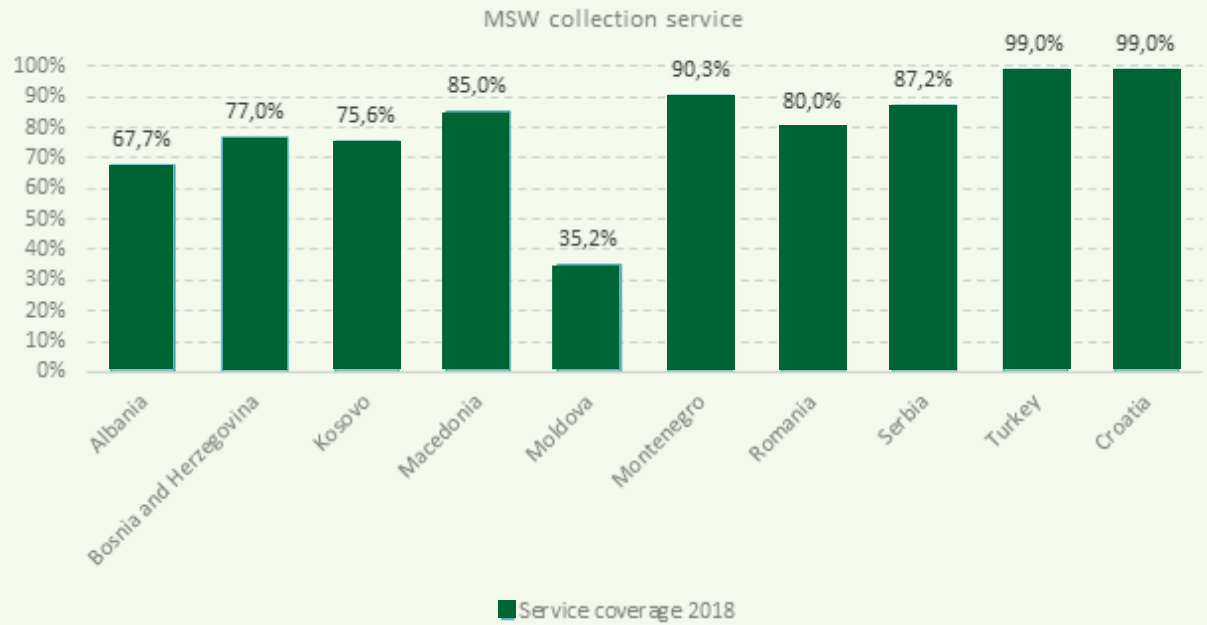
Only B&H and Montenegro reported the existence of landfills for inert waste. This could be that inert waste is used for daily coverage of solid waste at non-compliant landfills or that this waste category is not followed closely and that there is no knowledge of the final disposal site for this waste.

5.7 Population covered by MSW collection service

This year's SWM Benchmarking Report, prepared within the framework of NALAS Regional Decentralization Observatory—RDO, has two additional indicators included – MSW collection service and Population covered by compliant landfills. The targets for waste management are good services available to all. There as MSW collection service would provide beneficial data on service effectiveness. The target value for this indicator is 100% whereas the entire population would have waste management services available. This indicator has been introduced in the 2018 issue and has no data from previous years.

3 out of 10 countries have reported a quite high percentage for service coverage over 90%, where Croatia and Turkey are close to reaching a benchmarking value with 99% each. The rest of the target countries are within the range from 70-85% except for Moldova (35,2%).

Chart 16. Chart 16. MSW collection service in 2018



5.8 Population covered by compliant landfills

This indicator provides data on the percentage of the population whose solid waste has been deposited to compliant landfills. Respecting the practices within target countries and the region, sanitary landfills and non-compliant municipal landfills are considered as compliant landfills for this indicator. The benchmark value is 100%.

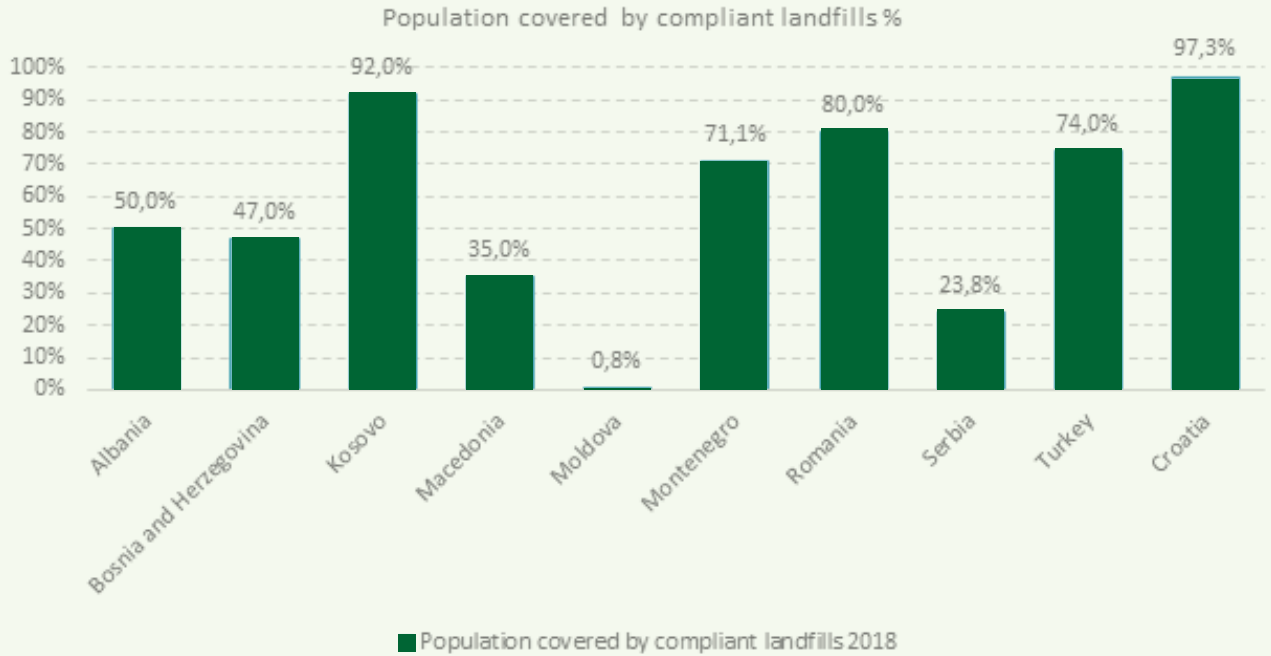


Chart 17 Population covered by compliant landfills

Even though there has been a notified improvement in the number of sanitary landfills in the target countries, as well as the reduction in illegal dumpsites, still the figures for the percentage of population covered by compliant landfills are quite low. That would implicate that still large amount of waste end up in the environment uncontrolled. Moldova as a country with no sanitary landfills, the vast amount of non-compliant landfills and a population of over 3,5 mil people, whose waste generation rate is 0,75 kg/cap/day, concludes that over 2.600 tons of municipal solid waste per day end uncontrolled in the environment. Serbia, Albania, B&H, and Macedonia have less than half of the population covered by compliant landfills which is quite low. Concerning this indicator, Kosovo and Croatia have the most desirable percentage, close to benchmark value, 92% and 97,2% in respected values.

5.9 Material footprint

Material Footprint as an indicator reflecting the actual consumption of raw materials with in the country and is presented in tons per capita. It usually exceeds domestic extraction of natural resources since incorporates also imports but excludes the export of raw materials. It is based on Domestic Material Consumption (DMC) and provides insights on economy-wide material flow accounts at the national level. It measures the total amount, in tons, of material directly used in an economy, either by businesses, government and other institutions for economic production or by households. DMC is measured in tons of natural resources per year and equals the extractions of materials used by producer units in the economy plus imports— called direct material input (DMI) - minus exports. The value of DMC also indicates the waste potential of a given region or country. The material footprint shows amounts of potential waste per capita. DMC data used for this analysis is taken from Eurostat[13] and are for 2017, and from questionnaires for countries not included in this database. Data show that two member states that joined the EU in 2007 (Romania and Bulgaria) have the biggest material footprint (21,56 and 19,60 t/capita) and are above the EU average of 13,8 t/capita. Other countries slightly above this line are Serbia (15,66), Slovenia (14,20) and Montenegro (13,87). These countries show the biggest potential for waste production. Other countries show less potential for the waste generation with Moldova having the smallest value of 7,7 t per capita.

When this indicator combined with the economic strength of the country shown by the GNI per capita as shown on Chart 16 we can see that only Slovenia and is some respect Croatia and Turkey have managed to decouple economic parameters from material use.

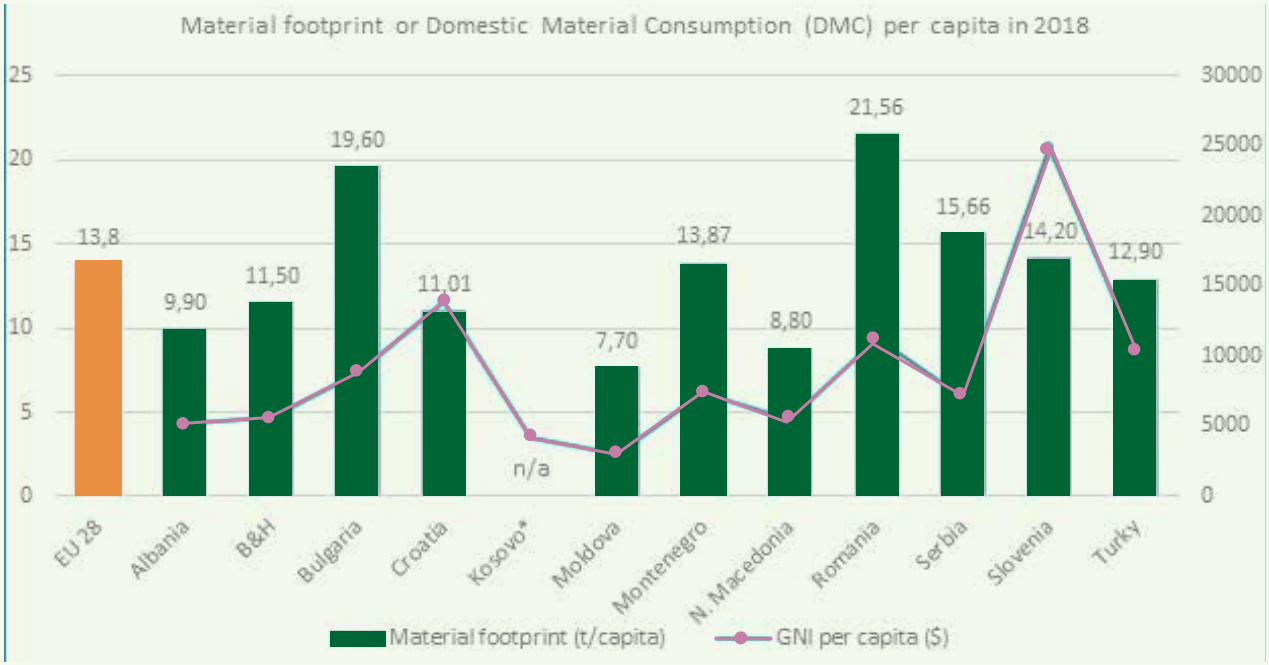


Chart 18. Material footprint or DMC per capita

13 https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Domestic_material_consumption

6

MUNICIPALITY REVIEWS

6.1 Municipality of Lezhe (Albania)

A total of 108,178 inhabitants live in the Municipality of Lezhe. 27,8% of the population lives in the urban area, which covers 16.5 km^2 or 30% of the territory. The remaining 72,2% live in the rural area that spreads on the remaining 490 km^2. 93,7% of the population living in the urban area is covered with MSW services vs. 50,9% of the population living in rural areas.

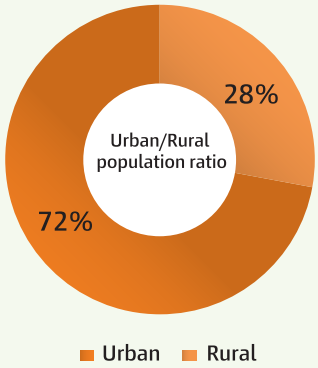


Chart 19. Population in urban vs. rural areas in Lezhe

Municipal solid waste generation per capita per day is 0,7 kg/day. The population covered by packaging waste collection service is 64%. The recycling rate is reported to be 8%. Waste composition in Lezhe has not changed compared to 2015. Most of the waste is biodegradable waste (44.3%), plastic packaging (9.8%) and cardboard waste (8.6%).

The waste management fee in Lezhe is 2,64 EUR/capita/month, and it entails the cost for collection of solid waste, transport, costs of the transfer station and street sweeping. The bill is separate from other municipal communal services bills. The tariff is determined based on a flat fee, regardless of the amount of waste generated, and it is the same for both urban and rural areas. Municipal Administration is responsible for the collection of the waste management fee, and the current fee collection ratio is approximately 85% in urban and 35% in rural areas, which brings it to waste management fee collection percentage of 59%.

The informal solid waste sector has been recognized in the Municipality of Lezhe, mostly employing low-income communities below the poverty line, persons with a low level of formal education, unemployed and homeless people. The municipality recognizes waste pickers and tries to help them by:

- ensuring the right over recyclables and a guarantee of regular access to waste at the source (street SWM equipment, landfill, etc.);
- helping the inthe formal sector to organize itself into cooperatives, associations, etc.;
- facilitating partnerships with the private sector.

Even though they have not been formally recognized by local or national regulations, the municipality is encouraging them in project-oriented activities.

Informal waste pickers generally prefer paper, hard plastic, and metal and glass waste; however, no data about the amounts of waste taken by waste pickers are recorded. Generally, the involvement of waste pickers in waste management is insignificant in terms of recyclable recovery rates.

All municipal waste from Lezhe is disposed of on the Bush regional sanitary landfill. No data about illegal dumpsites is reported.

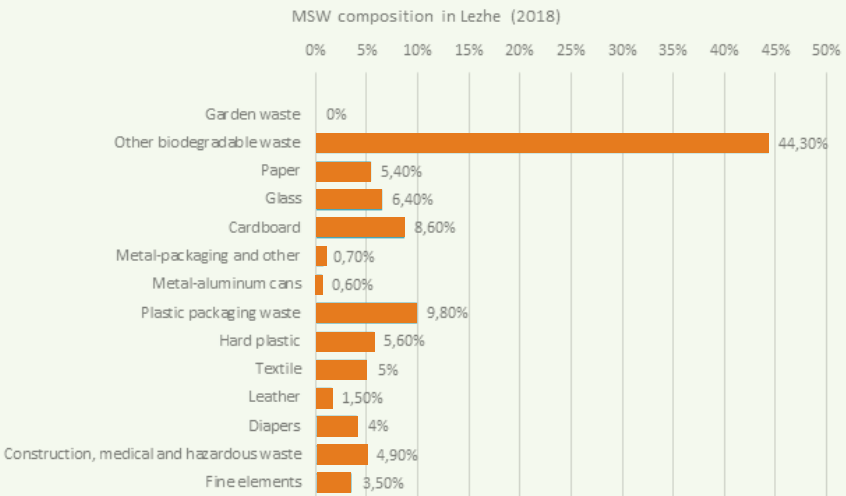


Chart 20. Municipal waste composition in the Municipality of Lezhe (2018)

6.2 Municipality of Durres (Albania)

A total of 314,496 inhabitants live in the Municipality of Durres. 65% of the population lives in the urban area, which covers 46.1 km² or 13% of the territory. The remaining 35% live in the rural area that spreads on 292.2 km². 80% of the population in the urban area is covered with MSW services vs. 70% of the population in the rural area. Compared with previous reporting year 2015, the percentage of the population in urban areas covered by MSW services had decreased (100% in 2015) and increased in rural areas (67,6% in 2015).

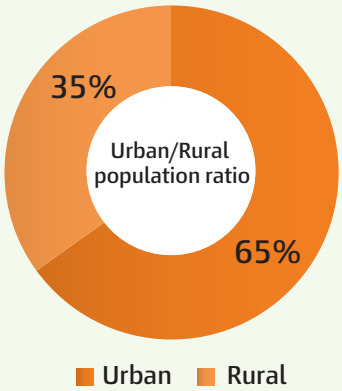


Chart 21. Population in urban vs. rural areas in Durres

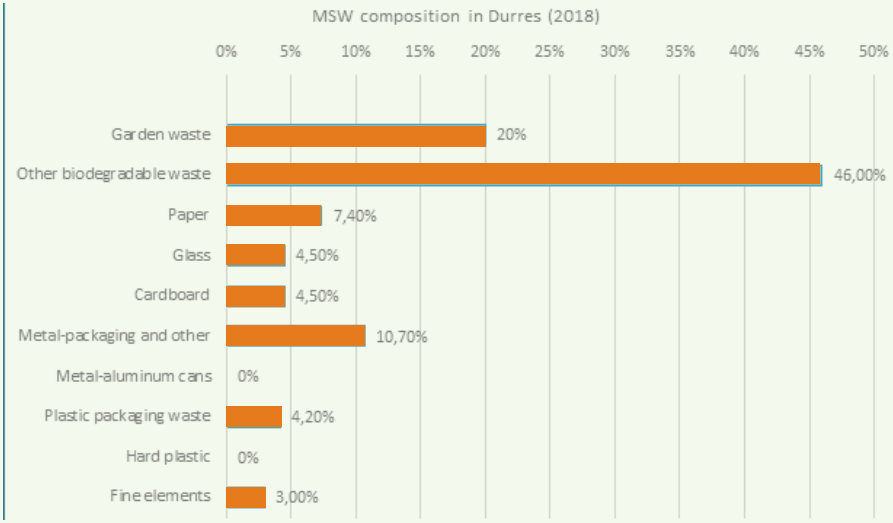
A slight increase in municipal waste generation per capita per day is reported and it is 0.5 kg comparing to 0,4 in the year 2015. Even though there is still no recycling in the municipality, data on waste composition is provided.

The waste management fee in Durres increased to 1.6 EUR/household/month. The difference from the previous reporting year 2015 is that now this is a uniform fee for urban and rural areas. The fee entails costs for waste collection, cleaning the streets, waste transport and landfilling. There was no specific calculation method employed. Waste management costs are charged as part of the water bill. The entity responsible for the collection of the waste management fee is the Municipal Administration. Waste management fee collection ratio has been reported on 60% for the whole municipality, whereas 45% for urban and 15% for rural areas.

The informal solid waste management sector operates in the municipality. Informal waste pickers are low-income communities below the poverty line, unemployed people and women and children. They are not recognized by the local government authorities. There are no legal regulations on either national or the local level that address this problem. Waste pickers operate independently and usually collect waste both from containers and dumpsites. Collecting waste from landfills is illegal, and informal waste pickers have no permission from the managing authority. The most attractive type of waste for waste pickers is metal, followed by plastic and paper. No official data is gathered on quantities of waste collected by waste pickers, however, it is deemed to be very significant with up to 30% of recyclables.

There is a sanitary landfill for Municipality of Durres and the name is Porto Romano. However, there is still one non-compliant landfill as well as 1 big and 3 smaller dumpsites.

Chart 22. Municipal waste composition in the Municipality of Durres (2018)



6.3 Municipality of Bugojno (Bosnia and Herzegovina)

A total of 31,470 inhabitants live in the Municipality of Bugojno. 50% of the population lives in the urban area, which covers 9,07 km2 or 2,68% of the territory. The remaining 50% of the population live in the rural area that covers 351,11 km2. 100% of the population in the urban area is covered with municipal solid waste collection services, which is an 11% increase compared to 2015. In the rural area, 98% of the population is provided with the municipal waste collection service which is a slight decrease compared to 2015.

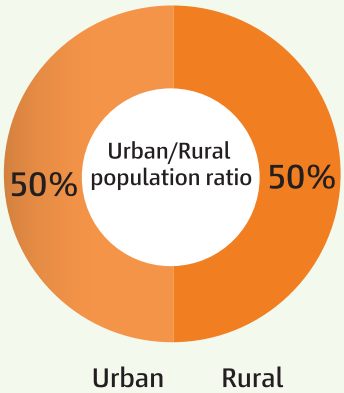


Chart 23. Population in urban vs. rural areas in Bugojno

The amount of waste generated per capita is 1.44 kg/day which is an increase of 35% compared to the year 2015. The municipality has no packaging waste collection service, and small efforts in recycling reported in 2015 now have vanished as for recycling rate is 0. The waste composition did not change compared to previous reports. The largest proportion is garden waste (10.82%) than construction waste (10.18%) and glass (9,28%). There is no change in waste generation and recycling indicators compared to 2014 and 2015.

The Municipality of Bugojno has introduced differences between urban and rural areas regarding the tariffing policy. The waste management fee is 0.06 EUR/m^2 for urban areas and 3,5EUR/household/month in rural areas. The tariff consists of costs for waste collection, transport, and disposal. Commercial entities, institutions, and businesses are charged differently. For example approx. 0.5 EUR/m^2 for catering facilities; approx. 0.75 EUR/m^2 for mixed goods; approx. 0.40 EUR/m^2 for public institutions; approx. 35 EUR + VAT for 5 m^3 containers. MSW services are priced on separate bills from other communal services. The Public Utility Company „Vodovod i Kanalizacija" Bugojno is responsible for fee collection. The fee collection ratio has increased and goes up to 85%.

The informal waste collection sector operates in the municipality. Informal waste pickers are low-income communities with incomes below the poverty line, low-income persons and unemployed people. No regulation covers this sector and it is not recognized by municipal authorities. Waste pickers collect waste from containers and landfills/dumpsites, although they have no permission for that. As a usual metal, paper and PET waste are most desirable for waste pickers, but there is no data for quantities.

The Municipality of Bugojno has no sanitary regional landfill. Waste is disposed of on the non-compliant municipal landfill „Dubočine – Talin Gaj", and on officially recorded 18 illegal dumpsites.

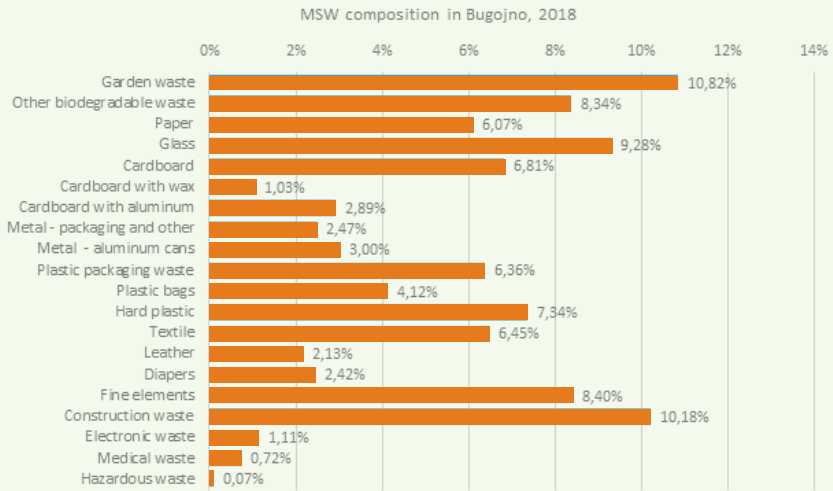
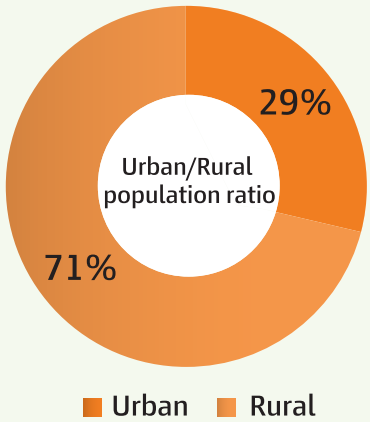


Chart 24. Municipal waste composition in the Municipality of Bugojno (2018)

6.4 Municipality of Cazin (Bosnia and Herzegovina)

A total of 66,149 inhabitants live in the Municipality of Cazin which is 5% less than in 2015. Around 29% of the population live in 10,5% of the urban area on 26.94 km^2, while 71% of the population lives in 229.06 km^2 of rural areas. The urban area is completely covered with MSW services and rural area is surprisingly good covered with 93% which is an increase compared to 2015 (77%).

Chart 25. Population in urban vs. rural areas in Cazin



Municipal solid waste generation has slightly decreased for **the** previous reporting period and now is 0.39 kg/cap/day. Great improvement in packaging waste collection service has been reported since there was none in 2015 and this year is 100% for all inhabitants. Also, the recycling rate is now 8,5%. The share of biodegradable and garden waste is significant, i.e. approximately 56% in total. Paper and cardboard are around 8%, while metals are quite low, below 1%. There is no change in waste generation and composition compared to 2015.

There have been no changes in the fee, neither the amount nor the services included in the fee. The waste management fee in Cazin is 4.09 EUR/household and has not been changes since 2015. The fee consists of costs for waste collection, transport, and disposal. The fee is calculated based on a flat fee and is paid by each household, regardless of the amount of waste generated. The bill is separate from other communal utility bills. The price is uniform for both urban and rural areas. The entity responsible for waste management is the public utility company „Čistoća". The overall fee collection rate is 87%.

The informal waste collection sector operates in the municipality but is only present in the landfill. Waste pickers consist of low-income persons below the poverty line, unemployed people and homeless people. Even though it is present the waste pickers are not recognized by authorities and there is no regulation regarding the issue. They prefer metal overall recyclables. There is no data for quantities.

All the waste from Municipality of Cazin is transported and disposed of on the non-compliant municipal landfill „Medžare-Vlaški Do" located in the Municipality of Bosanska Krupa and shared with two other municipalities. There are 25 officially recorded illegal dumpsites which is much higher than 9 reported in 2015.

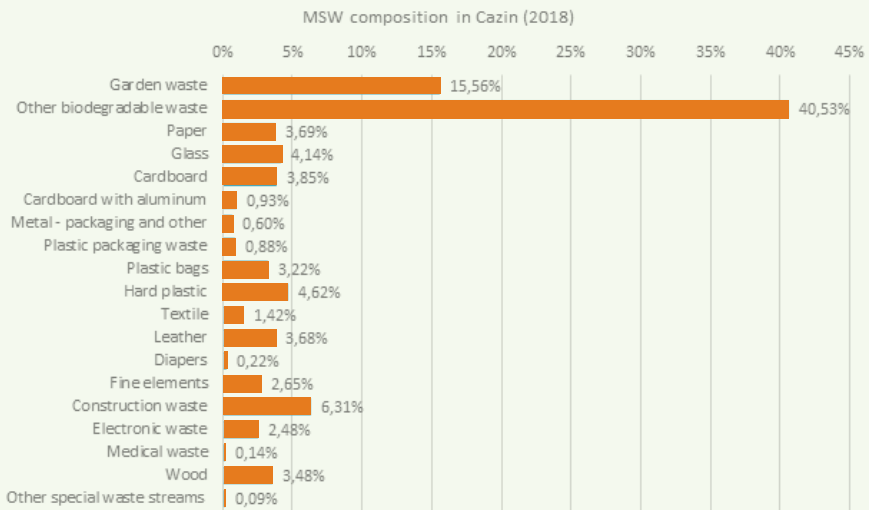


Chart 26. Municipal waste composition in the Municipality of Cazin (2018)

6.5 Municipality of Prijedor (Bosnia and Herzegovina)

Municipality of Prijedor has a population of 78.826 inhabitants which is 24% less than in 2015. Even though the depopulation is present, the urban/rural ratio has not changed. 53% of the population lives in the urban area, which covers 119 km^2 or 14.3% of the territory. The remaining 47% live in the rural area that spreads on 715 km^2. MSW collection services keep the trend of increasing both in rural and urban areas. It has been reported that 67% of the total population is covered with MSW collection services, which is an increase of 7% compared to 2015. MSW collection service in the urban area is 90% and in rural area 32,5% (2% increase both areas)

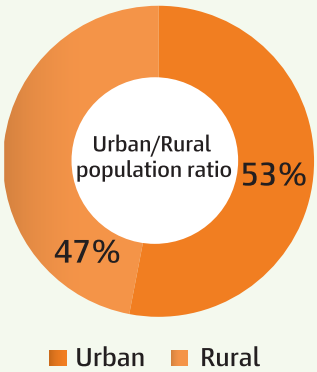


Chart 27. Population in urban vs. rural areas in Prijedor

Municipal waste generation per capita is 0,77 kg/cap/day from households, showing a significant decrease of 40% compared to 2015. Waste generation in the commercial sector increased from 8,97 kg/day in 2015 to 9,4 kg/day, which is close to 9.72 kg/day in 2014. Packaging waste collection service keeps a positive trend and is on 51% of the population compared to 45,16% reported in 2015 and almost 43.86% reported in 2014. The recycling rate in Prijedor increased from 2.78% in 2014 to 6.52% in 2015 an slightly decreased to 6,23% in 2018. The following amounts of recyclables were collected in 2018:

- Cardboard – 206.96 t/y
- Nylon – 20,78 t/y
- PET – 4,7 t/y

Since there was no recent analysis of municipal waste morphology within the Municipality of Prijedor, the same waste composition has been reported for the year 2018. Garden and other biodegradable waste make over 56% of whole municipal waste.

The waste management fee has a very slight increase in 0,068 EUR/m^2 compared to 0.063 EUR/m^2 in 2015. The fee itself consists of costs for waste collection, transport, and disposal. The price is determined based on square meters of the residential area, and bills are separate from other communal services. The fee is uniform for both rural and urban areas. The responsible entity for fee collection is A.D. "Komunalne usluge" Prijedor. The waste management fee collection ratio has not been reported this year.

The informal solid waste collection sector operates in the municipality. Informal waste pickers come from low-income communities with incomes below the poverty line and unemployed people. The sector is not recognized by the authorities, and no regulation deals with this issue. Waste pickers collect waste from containers, bins, and landfill even though it is prohibited. They collect all the most desirable recyclables such as metal, PET, paper and even hard plastic. The exact quantities of waste collected by pickers are unknown and the Involvement of the sector is deemed as of low significance.

The situation with sanitary landfill has not changed. The new sanitary landfill "Kurevo" is still under construction and municipality uses one non-compliant municipal landfill. There is no official data about illegal dumpsites.

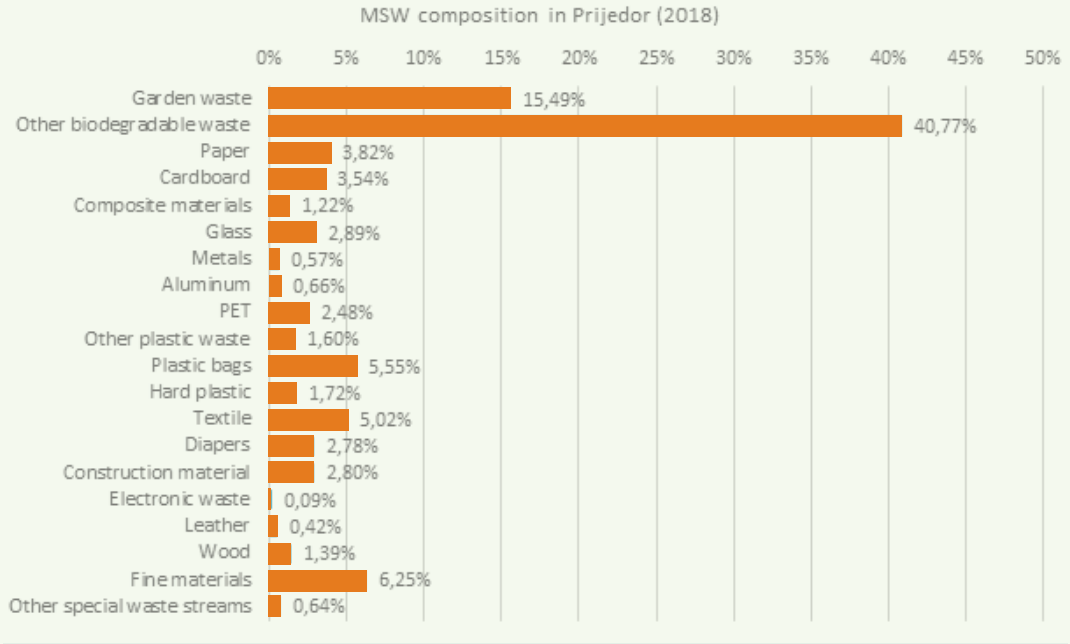


Chart 28. Municipal waste composition in the Municipality of Prijedor (2018)

6.6 Municipality of Laktasi (Bosnia and Herzegovina)

A total of 34.862 inhabitants live in the Municipality of Laktasi, 6,5% less than in the year 2015. Depopulation is primary in an urban area where 24% of the population live, compared to 45% in the year 2015, which covers 80 km^2 or 26% of the territory. The remaining 76% live in the rural area that spreads on 308 km^2. The population covered with MSW services amounts to 38.4%. The coverage of the population served with MSW services has improved compared to the last reporting year 2015. It is now 93% in urban areas and 74% in the rural area which is almost tripled compared to only 25%, in the year 2015.

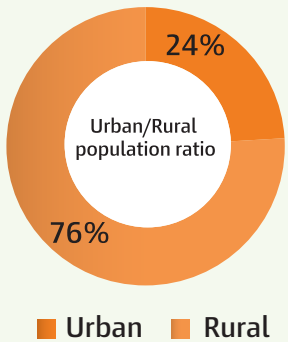


Chart 29. Population in urban vs. rural areas in Laktasi

Municipal waste generation per capita is 1,13 kg/day which is an increase compared to the 2015 generation rate of 1.02 kg/day, and even a bit higher than the 2014 generation rate of 1.09 kg/day. The municipality has no packaging waste collection service, yet the recycling rate has been reported as 1,09%, compared to no recycling in previous reporting years 2014 and 2015, this indicates new efforts in the municipality. Data on waste composition is not available.

The waste management fee remains 6 EUR/household/month, and it entails costs for waste collection, transport, transport stations, and disposal. Municipality implements a flat rate regardless of the quantity of waste or number of inhabitants or size of the household. The fees are uniform for urban and rural areas. However, there is a different pricing policy for commercial entities, institutions, restaurants, etc. The bill is separate from other

communal services and collected by Public Utility "Budućnost", Laktasi. The waste management fee collection ratio is 78%.

The informal waste collection sector operates in the municipality. Waste pickers consist of low-income persons below the poverty line and unemployed people. The sector is not recognized by the authorities, and no regulation deals with this issue. Waste pickers collect waste from solid waste containers. Waste pickers prefer metal and PET waste; however, the exact quantities of collected waste are not available. The involvement of the informal sector in the overall waste collection scheme is considered insignificant.

The waste from the Municipality of Laktasi is transferred to Banja Luka where is deposited on the Ramići sanitary landfill. It has been reported 7 illegal dumpsites which are less than in the year 2015.

6.7 Municipality of Novi Marof (Croatia)

Municipality of Novi Marof has a population of 13.246 inhabitants with a surface area of 111,75 km^2, all rural. The total population covered with collection services is 90% for the whole municipality.

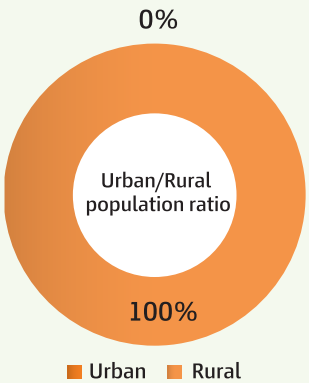


Chart 30. Population in urban vs. rural areas in Novi Marof

Municipal solid waste generation per capita is very low as 0,29 kg/day. The population covered by packaging waste collection service is 65%, recycling is implemented by there are no precise data from the municipality of Novi Marof. However, the estimate of recycling rate for this area of Croatia is 32,89% or by the recyclables as follows: Paper: 57,85%; Metal: 53,77%; Plastic: 19,93%; Glass: 0%. The data presented for waste composition is the national average for the region where garden waste and other biodegradables are dominant with almost 37% followed by paper and cardboard with little over 23% and plastic packaging, bags and hard plastic with a little bit less than 23%.

Waste management fee in Municipality of Novi Marof is a combination of fix and variable part and it ranges from 3,40 EUR to 13,60 EUR (fixed part) + 0,01 EUR per liter of mixed communal waste as variable part. Pricing of waste management services is calculated by combining fixed and variable parts. The fixed part is determined by the size of the container for mixed communal waste (every household can decide on 80, 120, 240, etc. liter container and every container has a fixed monthly price) and the variable part is determined as "pay-as-you-throw" system. The SWM fee entails the waste collection, transport, transfer station, composting, and recycling and disposal costs. The bill is separated from other utility services and it is collected by Public Utility Company. The collection rate for the Municipality of Novi Marof is 90%.

The informal waste collection sector is not present in the municipality. The regional sanitary landfill has not yet been built in the municipal vicinity; however, all municipal solid waste is disposed of at the Kurjakana landfill that meets the conditions for sanitary disposal. No illegal dumpsites or inert waste landfills have been reported.

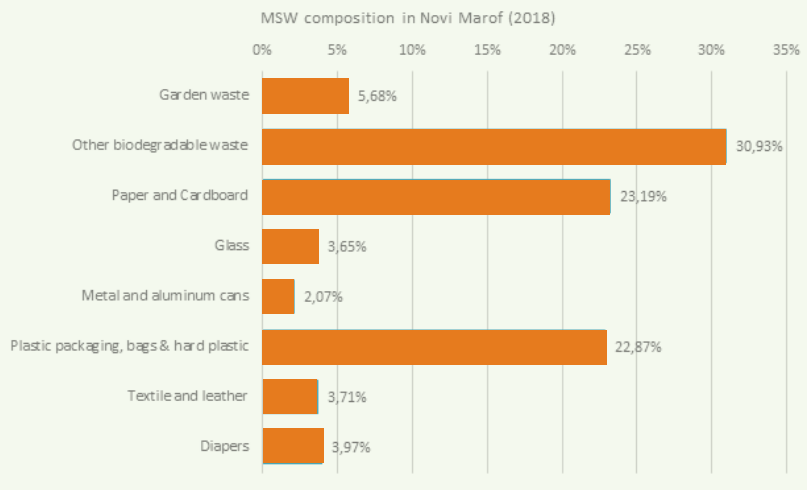


Chart 31. Municipal waste composition in the Municipality of Novi Marof, 2018

6.8 Municipality of Dubrovnik (Croatia)

A total of 42.615 inhabitants live in Municipality of Dubrovnik. 67% of the population lives in the urban area of 12,3km^2, while 33% live in rural areas with a surface of 130,5km^2. The total population of Dubrovnik has been covered both by collection services and packaging waste collection services (100%). Municipal solid waste generation per capita is 2,01kg/day.

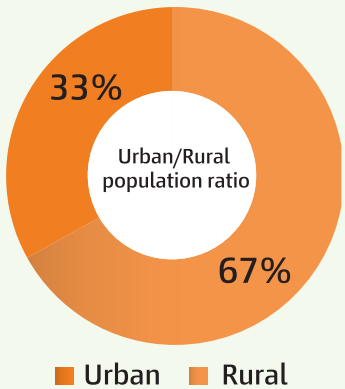


Chart 32. Population in urban vs. rural areas in Dubrovnik

Same as the Municipality of Novi Marof, there are no data on solid waste morphology, yet national data has been provided for the Municipality of Dubrovnik also. However, recycling is implemented within the municipality and average recycling rate 20,08% with specific rates for paper: 34,45%; metal: 32,89%; plastic: 2,81%; glass: 10,16%.

The waste management fee in the Municipality of Dubrovnik is a combination of fix and a variable part. Fix part ranges from 3,40 EUR to 13,60 EUR (depending on the size of container) and the variable part is 0,02 EUR per liter of mixed communal waste per m^2 of the household for the urban area, and 0,01 EUR per liter of mixed solid waste per number of monthly collections. Pricing of waste management services is calculated by combining fixed and variable parts. As an encouragement for waste reduction, there is an additional discount of 13% for all households who implement composting. The bill is separated from other utility services and it is collected by Public Utility Company. The collection rate is 98%.

The informal waste collection service has not been recognized in the Municipality of Dubrovnik. There is no sanitary landfill for Dubrovnik, but all solid waste is disposed of at non-compliant municipal landfill Grabovica. No illegal dumpsites have been reported.

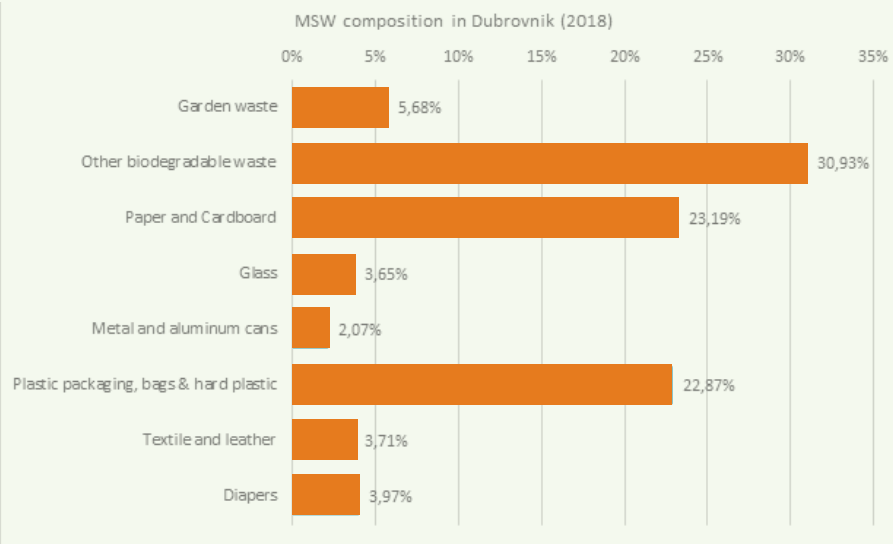


Chart 33. Municipal waste composition in the Municipality of Dubrovnik, 2018

6.9 Municipality of Ferizaj/Urosevac (Kosovo)

The data for the Municipality of Ferizaj/Urosevac has not changed since the last 2015 Report. The total population is 108,610 inhabitants. 45% of the population lives in the urban area of 142 km2, which makes up 45% of the total municipality surface area. The remaining 55% of the population live in the rural area. The total population covered with collection services is 61,7%. The urban area is 100% covered with a collection service, which is a 20% increase from the year 2015, while the rural area collection coverage has decreased by 53,53%, which is 10% less than in the previous reporting period. However, this is not due to the performance of the waste sector but rather depends on availability and proof of data submitted.

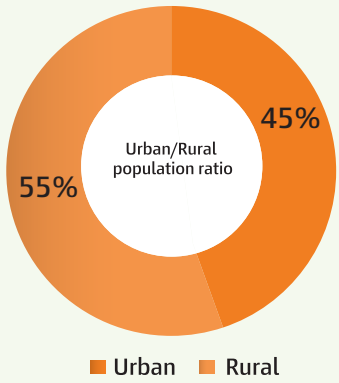


Chart 34. Population in urban vs. rural areas in Ferizaj/Urosevac

Municipal solid waste generation per capita is 0,83 kg/day which is significantly less than 1,15 kg/day reported in the year 2015. The municipality has no packaging waste collection service, and the recycling rate remains 0%. Waste is mainly composed of garden waste and biodegradable waste (74.60%) and plastic (12.40%) and paper (7.80%).

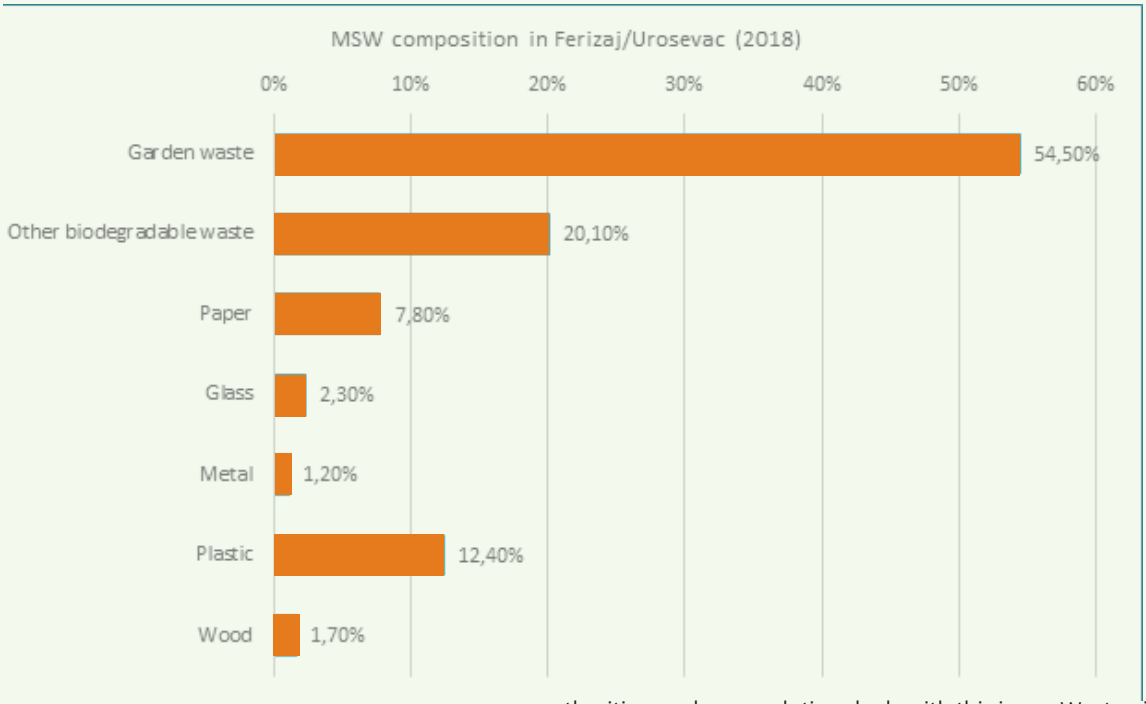


Chart 35. Municipal waste composition in the Municipality of Ferizaj/Urosevac, 2018

The waste management fee is 4.65 EUR/month and has not been changed since 2015. The fee entails the waste collection, transport, transfer station, and disposal costs. The collection fee is calculated based on a flat fee and is paid by each household, regardless of the amount of waste generated. These bills are separated from other utility services. The fee is uniform for both rural and urban areas. The public utility company „Ormož"is responsible for fee collection. The collection rate is 88,36%.

The informal waste collection sector is present in the municipality. The system is operated by low-income persons below the poverty line and unemployed people. The sector is not recognized by the authorities, and no regulation deals with this issue. Waste pickers collect waste from waste containers and landfills, for which they have no permission. Waste pickers prefer metal and PET waste; however, the exact quantities of taken waste cannot be found, since there is no official data. The involvement of the informal sector is deemed low and mostly restricted to individual trade.

The municipality has one sanitary regional landfill Gjilan and 44 registered illegal dumpsite which is less than in the last reporting period. There are no inert waste landfills in this municipality.

6.10 Municipality of Gjakova/Djakovica (Kosovo)

A total of 94,556 population lives in the Municipality of Gjakova/Djakovica. The total surface area of the municipality is 586 km^2, out of which 4% is urban area accommodating 43% of the population. The remaining 96% represents the rural area and it accommodates 57% of the population. Improvements in the waste management sector in Gjakova/Djakovica are visible and they keep a positive trend since 2014. The population covered with waste collection services is 80%, showing an increase of 13%. The urban area is completely covered with collection services, while the rural area is 60% covered, which is 50% higher than the last report and keeping the trend.

The population covered by packaging waste collection services has improved from the last report up to 85%. Municipal solid waste generation per capita is the same 1.5 kg/day. The composition of waste remained the same from the last report, proving that there is no constant monitoring and measuring of solid waste. Waste is mainly composed of the garden and biodegradable waste (45.20%) followed by plastic packaging waste (10.30%) and other waste (11.50%). The recycling rate has doubled to 10%.

The waste management fee is 4.65 EUR/household/month and it entails the waste collection, transport, and disposal costs. The pricing structure is based on a single fixed fee for the service, regardless of the amount of waste generated. Waste bills are separate from other utility services. The fee is uniform for both rural and urban areas. A public utility enterprise is responsible for waste collection. The waste fee collection rate is 100% in urban areas and 60% in rural areas.

The informal waste collection sector operates still stays as a problem in the municipality. Representatives of this sector are mostly low-income persons below the poverty line, unemployed people and homeless persons. The sector is not recognized by the authorities, and there are no regulations that deal with this issue. Waste pickers collect waste from solid waste containers and landfills without permission. The most collected material is metal, paper, glass and PET plastic. Even though the informal sector in the waste collection is present, it does not represent any threat to the waste company.

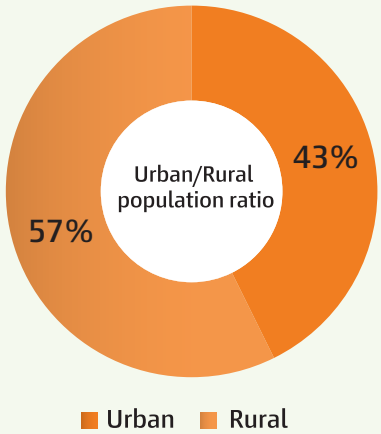


Chart 36. Population in urban vs. rural areas in Gjakova/Djakovica

The municipality has no sanitary regional landfill but has a transfer station "Kolonia" from where waste is transported to a landfill. The number of illegal landfills has decreased significantly to 10 registered illegal dumps. The municipality has 1 landfill for inert waste.

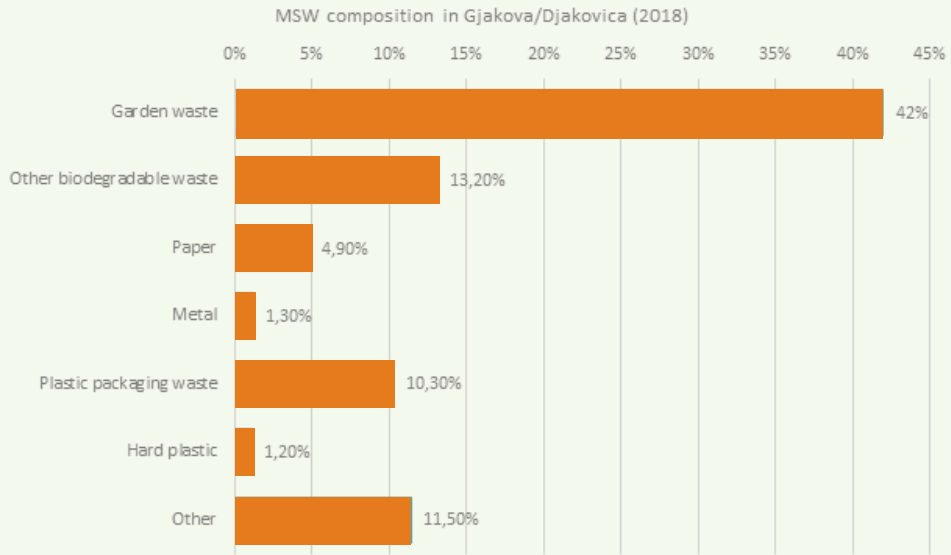


Chart 37. Municipal waste composition in the Municipality of Gjakova/Djakovica

6.11 Municipality of Kumanovo (North Macedonia)

Unfortunately, there has not been almost any change in the Municipality of Kumanovo since the last reporting year 2015. A total of 108,048 population lives in the Municipality of Kumanovo, out of which 72% is in its urban area, while the remaining 28% live in its rural area. The total municipal surface area is 509.5 km2. Data on the territorial division between rural and urban zones is not available. The population covered with MSW services in total is 72%. The urban area is completely covered with services, while the rural area has an extremely low 4% coverage.

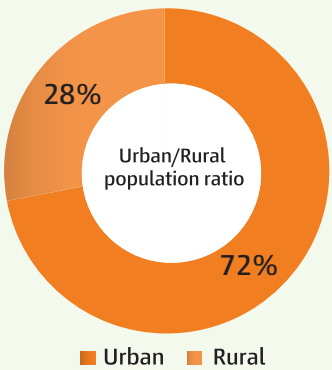


Chart 38. Population in urban vs rural areas in Kumanovo

Data on population covered with packaging waste collection services and the recycling rate is not available. The only reported change is in municipal waste generation per capita—1.369 kg/day, which is almost 40% higher than in the year 2015 (0.83 kg/day). No changes have been recorded in waste composition. Waste is mostly composed of biodegradable and garden waste (47.52%), with a significant portion of waste recorded as "other", which consists of construction material and electronic waste (14.93%). Plastic packaging waste makes up 7.43% of the waste.

Also, neither the prices nor the tariffing system has been changed since the year 2015. The waste management fee is 0.0488 EUR/m2 for households in the urban area, 3 EUR/month for households in the rural area, and 0.031 EUR/m2 for the industry. The price entails costs of collection, transport, disposal of waste and sweeping of streets. The system is a bit complex in comparison with other municipalities in the region; urban area households and companies/industries pay a waste management fee per square meter of the residential area, while rural households have a flat fee per month. Waste bills are separate from bills for other utility services. A public company is responsible for waste management fees and waste collection. Even though waste fee collection rates have been reported in 2015, (88.92% for rural areas and in urban areas 88.14% for urban areas) there are no data for this year's report.

The informal waste management sector operates in the

municipality. Waste pickers consist of low-income persons below the poverty line, unemployed people and homeless persons. The sector is not recognized by the authorities, and there are no regulations that deal with this issue. Waste pickers collect waste from solid waste containers and landfills, without any explicit permission or recognition.

Waste pickers prefer metal and PET waste; however, the exact quantities of taken waste cannot be given, since there is no official data. The influence of the informal sector in the municipality is unknown.

The municipality has no regional sanitary landfill. Waste is disposed of on 1 non-compliant municipal landfill and around 16 officially recorded illegal dumpsites which have increased from the last reporting year.

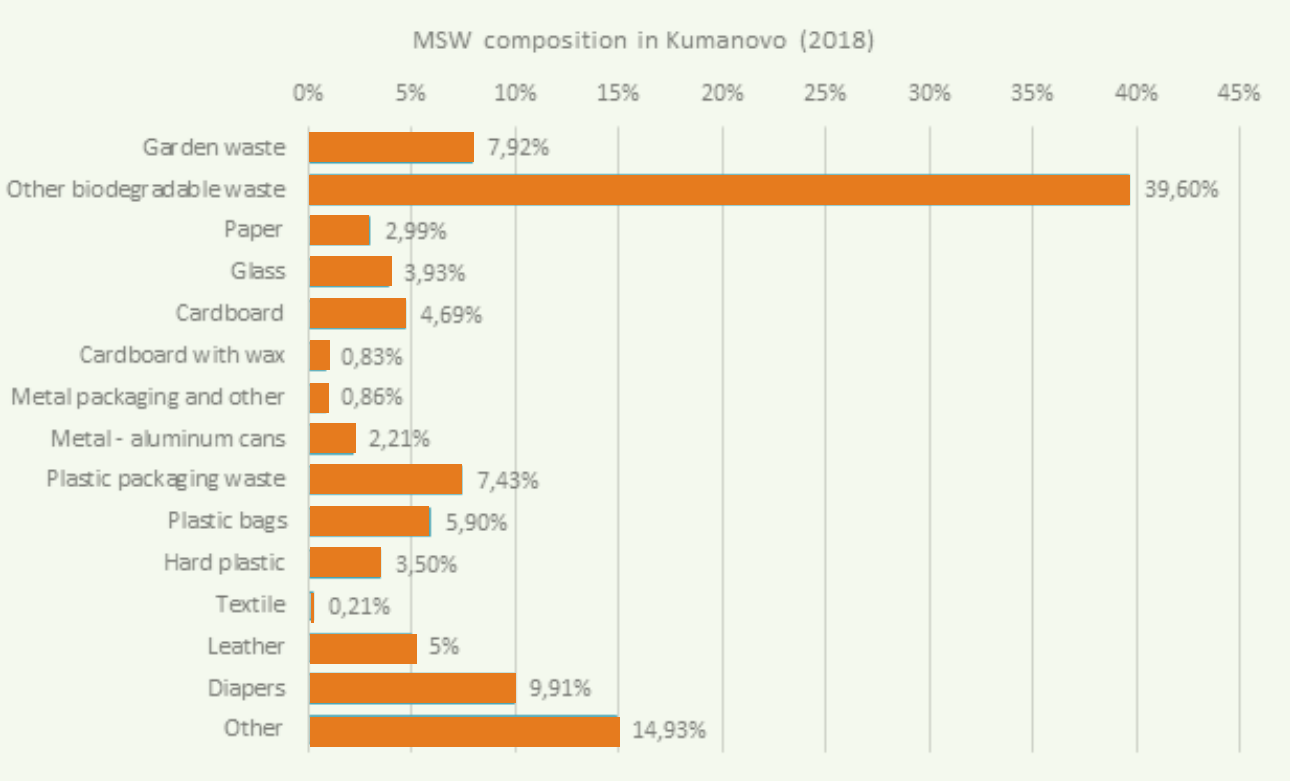


Chart 39. Municipal waste composition in the Municipality of Kumanovo

6.12Municipality of Lipkovo (North Macedonia)

A total of 29,519 inhabitants live in the Municipality of Lipkovo. The municipality has no urban areas, therefore the entire territory of the municipality is rural. Its total surface area is 267.82 km2. The population covered with municipal waste collection services is 50% in total.

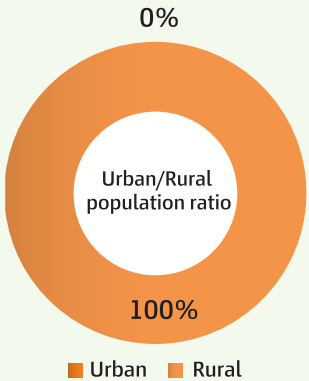


Chart 40. Population in urban vs rural areas in Lipkovo

Municipal waste generation per capita is extremely low at 0.10 kg/day which is even less than 0,26 kg/day reported in the year 2015. The figure on the population covered with packaging waste collection services and the recycling rate is not available. Waste is mainly composed of garden waste and biodegradable waste (52.55%), with a significant amount of diaper waste (10.53%) and unclassified waste, usually construction and electronic waste (9.93%).

The waste management fee is 2.44 EUR/household/month and has not been changed since 2015. The fee covers the waste collection, transport and disposal costs. Payment is made at a flat rate per capita. These bills are separate from bills for other utility fees. Waste management and fee collection are operated by the Public Utility Company. The waste management fee collection ratio has not been reported.

The informal waste collection sector operates in the municipality. Waste pickers consist of low-income persons below the poverty line, unemployed people and homeless persons. The sector is not recognized by the authorities, and there are no regulations that deal with this issue. Waste pickers collect waste from solid waste infrastructure and landfills. Waste pickers prefer metal and PET waste; however, the exact quantities of waste collected cannot be found, since there is no official data. The involvement of the informal sector is deemed insignificant. The Municipality of Lipkovo has 1 non-compliant landfill. The recorded number of illegal dumpsites is 8, which is higher than reported in 2015.

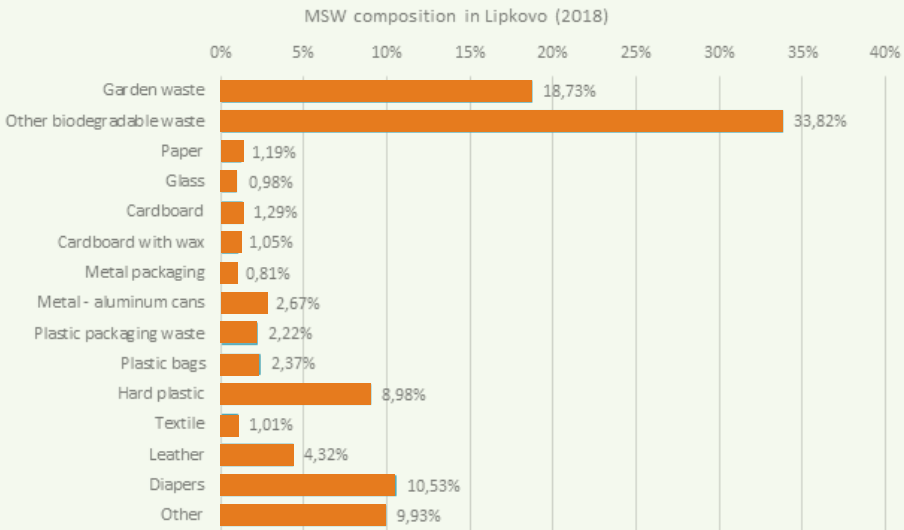


Chart 41. Municipal waste composition in the Municipality of Lipkovo

6.13 Municipality of Soldanesti (Moldova)

A total of 41.200 inhabitants live in the Municipality of Soldanesti. The total surface area is 596 km^2, out of which 11% is urban area accommodating 18% of the population. The rural area makes up the remaining 89%, with 82% of the population living there. The population covered with waste collection services in total has increased since 2015 from 14,4% to 20% in 2018. Waste collection coverage for the urban area has slightly increased to 41,64%, while in the rural area, the coverage has doubled from 2015 and now it is 17,21%.

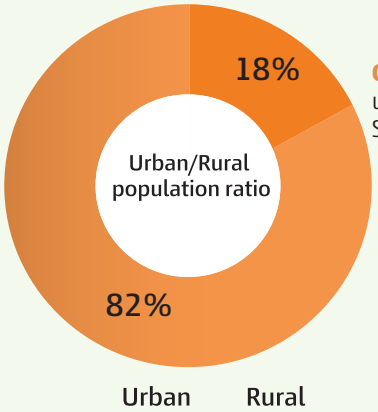


Chart 42. Population in urban vs rural areas in Soldanesti

Municipal solid waste generation per capita has increased by almost 30% up to 0.79kg/day. Only 11,53% of the population is covered by the packaging waste collection service, and the recycling rate is still under 1%. There have been no updated measurements of solid waste composition and "residuals" are still major categories, followed by plastic packaging waste and bags (9,1%) and diapers (8,4%).

The waste management fee is different for urban and rural areas. The fee is 0.70 EUR/month for urban and 0.40 EUR/month for rural areas and it includes transport, collection, and disposal of waste. Public Utility Company is responsible for collecting the bills which are separate from other communal services. The fee collection rate is 97% in rural areas and 98% in urban areas which is about 10% better than in the last reporting period.

The informal waste collection sector operates in the municipality. Waste pickers consist of low-income persons below the poverty line, unemployed people and homeless persons. The sector is not recognized by the authorities, and no regulation deals with the issue. Waste pickers collect waste from solid waste containers and at the landfill, without any permission. The most preferred waste material is metal and PET waste. Official quantities of waste collected by waste pickers are not available. The involvement of the informal sector is deemed low and mostly relegated to individual trade.

There are no sanitary regional landfills and no official data about illegal dumpsites in the municipality. Waste is disposed on 10 non-compliant landfills.

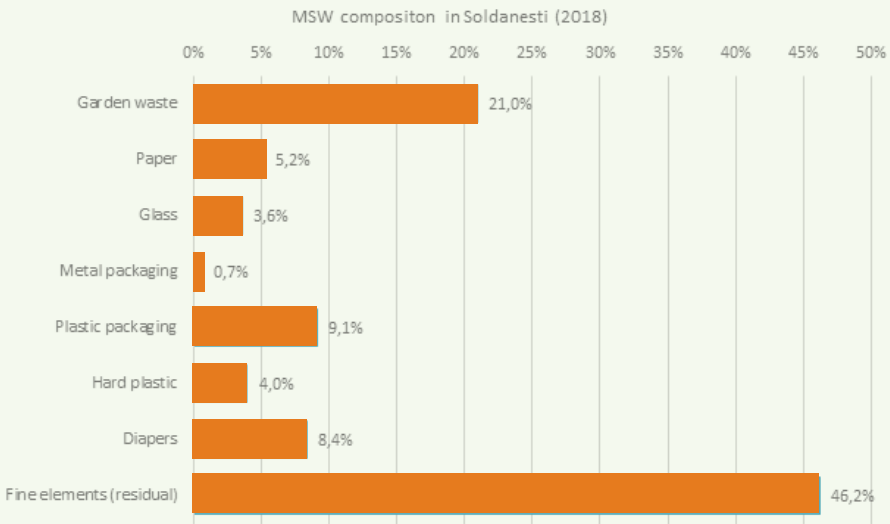


Chart 43. Municipal waste composition in the Municipality of Soldanesti, 2018

6.14 Municipality of Nisporeni (Moldova)

Depopulation is present in the Municipality of Nisporeni. A total of 16.638 inhabitants live in the municipality which is almost 5% less in the last 3 years. The total surface area is 90 km^2, out of which 33% is urban and accommodates 69% of the population. The rural area makes up the remaining 67% where 31% of inhabitants live. The population covered with waste collection services in the urban area is 50%, while in the rural area, the coverage is 19,5%. The average coverage rate for the whole municipality has slightly increased to 41%.

Municipal waste generation per capita records minor enlargement to 0.87 kg/day for households and 0.39 kg/m2 for commercial entities. There is no packaging waste collection service in the municipality and no recycling. The waste composition provided is average for the region since no measurement has been performed within the municipality.

The waste management fee has increased to 0.51 EUR/household/month and it consists of cost for waste collection, transport, and disposal. The cost is the same for both rural and urban areas. The fee is determined as a flat rate, regardless of the amount of waste produced. The bill is separate from other communal services and Public Utility Company is responsible for the collection of the waste management fee. The fee collection rate is around 70% in total, a bit better in urban area 71,2%, while in a rural area it is 68,4%.

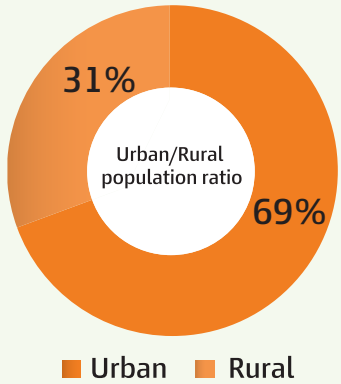


Chart 44. Urban vs rural population in the Municipality of Nisporeni

The informal waste collection sector operates in the municipality but individually and has no significance at all to the municipal waste sector.

There are no sanitary regional landfills but waste is disposed of on one non-compliant landfill. 3 illegal dumpsites have been reported and no landfill for inert waste.

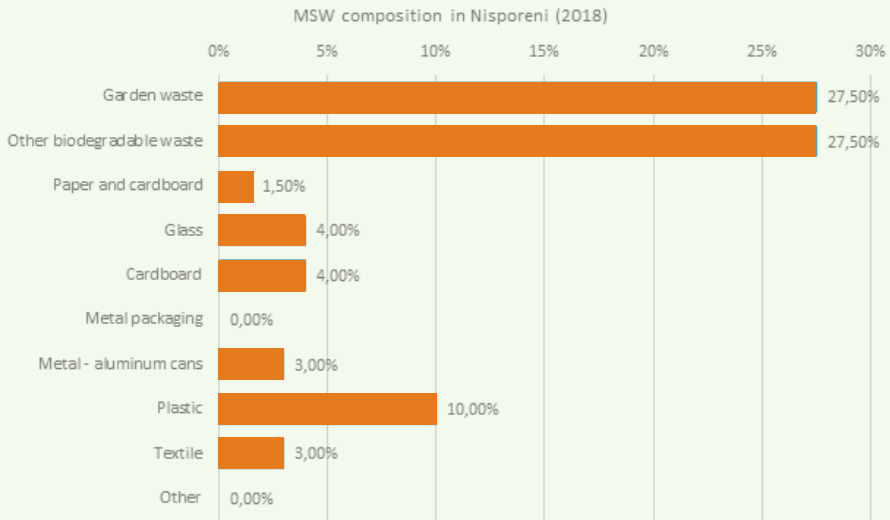


Chart 45. Urban vs rural population in the Municipality of Nisporeni

6.15 Municipality of Bijelo Polje (Montenegro)

A total of 46,051 inhabitants live in the Municipality of Bijelo Polje. The total surface area is 924 km2, out of which 1% is urban with 22% of the population living there. Around 78% of the population is living in rural areas which accounts for 99% of the total territory. Waste collection service in the urban area is still 100% while there is an increase in service coverage in the rural area and it is 30% now which is almost double since the last report. The average coverage rate for the whole municipality is 45% which is 30% higher than in 2015.

Municipal waste generation per capita has insignificantly decreased from 1.61 kg/day in the year 2015 to 1,58 kg/day in the year 2018. Waste is mainly composed of biodegradable waste (37.25%), paper (13.02%), plastic (11.92%) and glass (8.53%). The data provided is obtained from national statistics, presenting the waste composition typical for the region of north Montenegro. The municipality does not keep records of waste composition, nor has it separate waste collection services or any kind of recycling.

The waste management fee is 0.065 EUR/m^2 and it entails costs for waste collection, transport, disposal and cleaning of streets. The bill for solid waste services is separate from other utility bills. The system of payment is uniform for the whole municipality. The entity responsible for waste management fee collection is the Public Utility Company. The average fee collection ratio for the whole municipality is 75%.

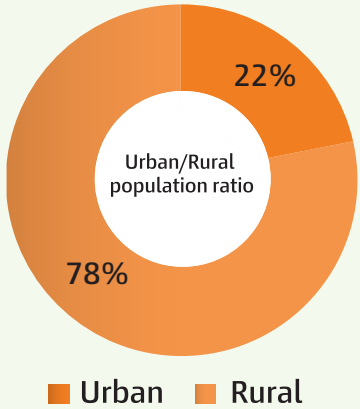


Chart 46. Population in urban vs. rural areas in the Municipality of Bijelo Polje

The informal waste collection sector operates in the municipality. Waste pickers consist of persons with low levels of formal education and unskilled persons. The informal waste pickers are recognized in the new Waste Management Law, which is not yet in force. The Law will prohibit buying off of any kind of waste from unregistered waste collectors (informal sector included). Waste pickers prefer metal and PET waste. The exact quantities of waste collected are not available. The involvement of the informal sector is deemed low.

There are no sanitary regional landfills in the Municipality of Bijelo Polje. Waste is disposed of on 1 non-compliant municipal landfill and 54 officially recorded illegal dumpsites. The improvement in the reduction of illegal dumpsites is visible since there is half of the number reported in 2015.

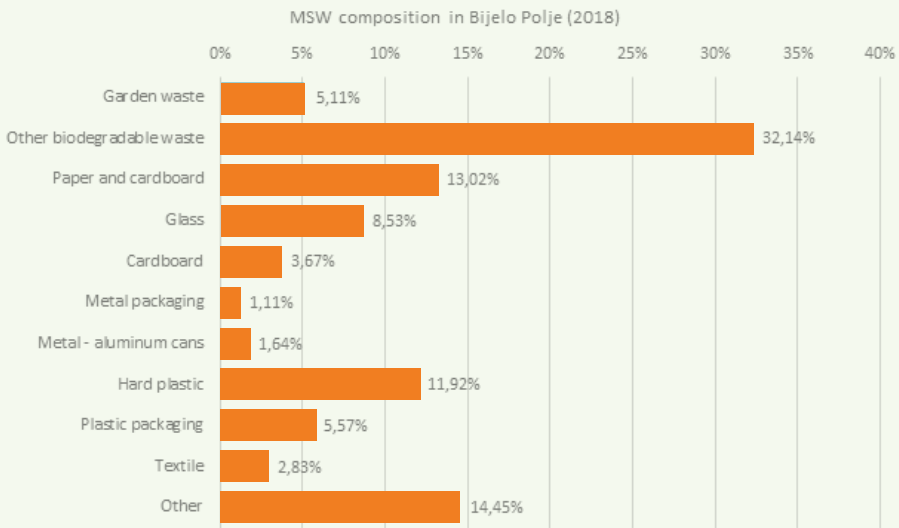


Chart 47. Municipal waste composition in the Municipality of Bijelo Polje

6.16 Municipality of Herceg Novi (Montenegro)

A total of 30,992 inhabitants live in the Municipality of Herceg Novi. 81% of the population is living in 3,6% of the territory with the surface area of 8,5 km2. Around 19% of the population is living in rural areas, which account for 96.4% of the total territory. 100% of the population in the urban area is covered with waste collection services, while approximately 50% is covered in the rural area. The average coverage rate for the whole municipality is 90%.

Municipal solid waste generation per capita increased from 0.99 kg/day in 2014 to 1.07 kg/day in 2015 up to 1,08 kg/day in 2018. The population covered with a packaging waste collection service is 74.21% the same as in 2015, but the recycling rate in the municipality has almost doubled by 17%. Waste is mostly composed of biodegradable waste (47.76%), with other major categories being glass (8%), cardboard packaging (8.07%), paper (6.13%) and plastics in total (14.93%). No changes in waste composition were recorded.

The waste management fee is 0.06 EUR/m2 and it entails costs for waste collection, transport, disposal and cleaning of streets. The bill for solid waste services is separate from other utility bills. The system of payment is uniform for the whole municipality. The entity responsible for waste management fee collection is the Public Utility Company. The average fee collection ratio for the whole municipality is 91%.

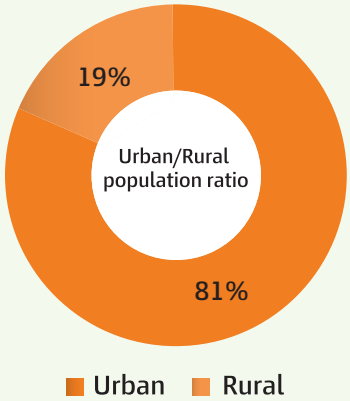


Chart 48. Population in urban vs rural areas in the Municipality of Herceg Novi

The informal waste collection sector operates in the municipality. Waste pickers consist of persons with low levels of formal education and unskilled persons. Informal waste pickers are recognized in the new Waste Management Law, which is not yet in force. The Law will prohibit buying off of any kind of waste from unregistered waste collectors (informal sector included). Waste pickers prefer metal and PET waste. The exact quantities of waste collected are not available. The involvement of the informal sector is deemed low.

There are no sanitary regional landfills in the Municipality of Herceg Novi. Waste is disposed of 1 non-compliant municipal landfill and 8 officially recorded illegal dumpsites.

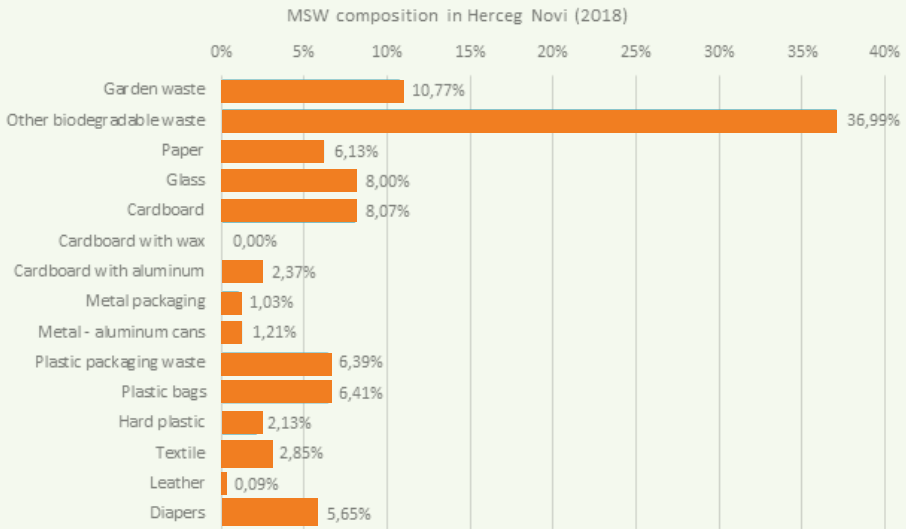


Chart 49. Municipal waste composition in the Municipality of Herceg Novi

6.17 Municipality of Dambovita, City of Târgoviște (Romania)

A total of 93.068 inhabitants live in Dambovita (Târgoviște), almost 8.000 inhabitants less than in 2015. The total surface area is 769 km^2, out of which 85% is urban, with 87% of the population living there. The remaining 13% of the population is living in rural areas, which account for 15% of the total territory. 100% of the population in both urban and rural areas is covered with waste collection services.

The municipal waste generation rate has decreased since the 2015 year, from 1.6 kg/cap/day to 0,8 kg/cap/day. Strong effort has been recognized in packaging waste collection service coverage from 17% in the 2015 year up to 100% this year. Also, the recycling rate has doubled to 30%. The new data has been reported for waste morphology, but still biodegradable waste is dominant (45%), followed by other major categories being cardboard (20%) and garden waste (15%).

The waste management fee is different in urban and rural areas. In urban areas, the fee is 2,5 EUR/month flat rate per capita, and in rural areas, it is 1,5 EUR/month flat fee for each household, regardless of the amount of waste generated and regardless of the number of household members. Companies are charged by a "Pay-as-You-Throw" system, i.e. weight or volume of collected solid waste in kg or m^3 or L. Costs calculated in the fee are waste collection, transport, disposal and street cleaning.

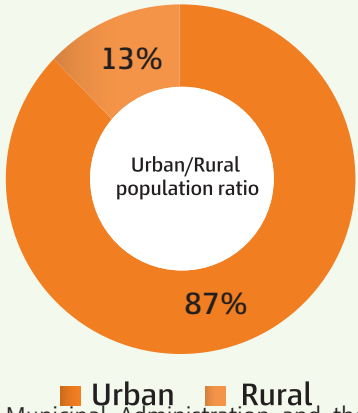


Chart 50. Population in urban vs rural areas in the Municipality Târgoviște

Municipal Administration and the Public Utility Company are both responsible for the waste management fee. The waste management fee collection rate is 100% overall.

The informal sector is not recognized by the local authorities, and it mostly consists of low-income people and persons below the poverty line. Waste pickers prefer metal and PET waste; however, the exact quantities of taken waste cannot be found, since there is no official data. The involvement of the informal sector is insignificant.

Waste from Municipality of Targoviste is disposed to regional sanitary landfill Aninoasa and Titu. According to the obtained data, there are no illegal dumpsites recorded.

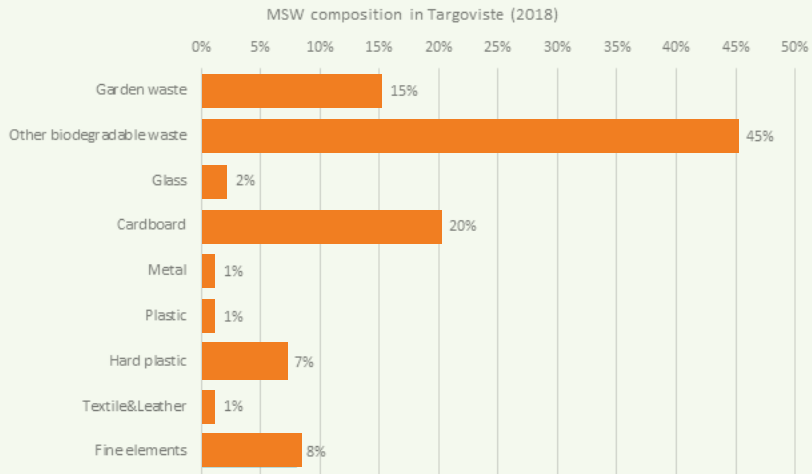


Chart 51. Municipal waste composition in the Municipality of Târgoviște, 2018

6.18 Municipality of Nis, City of Nis (Serbia)

A total of 255.288 inhabitants live in the Municipality of Nis. The total surface area is 597 km^2, out of which 44,7% is urban, with 73% of the population living there. The remaining 27% of the population lives in rural areas, which account for 55,3% of the total territory. 100% of the population in the urban area is covered with waste collection services while in the rural area that percentage is 88,7% while packaging waste collection service is 19%.

Municipal waste generation per capita is 0,56kg/day and recycling rate of 2,1%. Most of the waste is biodegradable or garden waste (49.6%) and fine elements (14.2%). Unlike other municipal solid waste morphology, the City of Nis reported the highest percentage of Textile in their solid waste (22,60%), followed by biodegradable waste 19,48%) and hard plastic (12,69%). The City of Nis was not presented in previous reports and therefore there are no comparing data.

The waste management fee is 0.04 EUR/m2 that entails costs for waste collection, transport, and disposal. The bill has a separate charging of SW services, and there is a uniform system of payment for the whole municipality. Charging the bills, distribution and collection of fees is outsourced to the third party. The waste management fee collection ratio is 97,3%.

The solid waste informal sector operates in the municipality, consisting of persons with low income, unemployed people and women and children. Unlike other municipalities, the informal sector has been recognized by the local government and supported by LG in creating

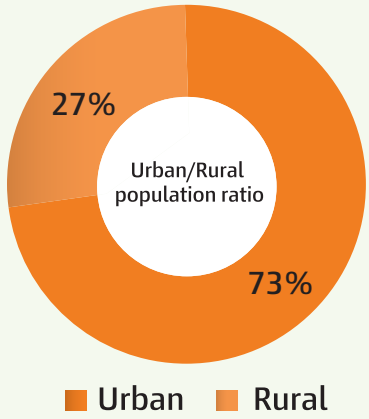


Chart 52. Population in urban vs rural areas in Niš

a database of informal collectors and working with GIZ to formalize their status. The waste pickers are organized in unions and project-related when applicable.

Waste pickers prefer metal and PET waste; however, the exact quantities of taken waste cannot be found, since there is no official data. The involvement of the informal sector is deemed very significantly.

The solid waste from the City of Nis is disposed of at non-compliant landfill and 1 landfill for inert waste. There are 90 illegal dumpsites reported.

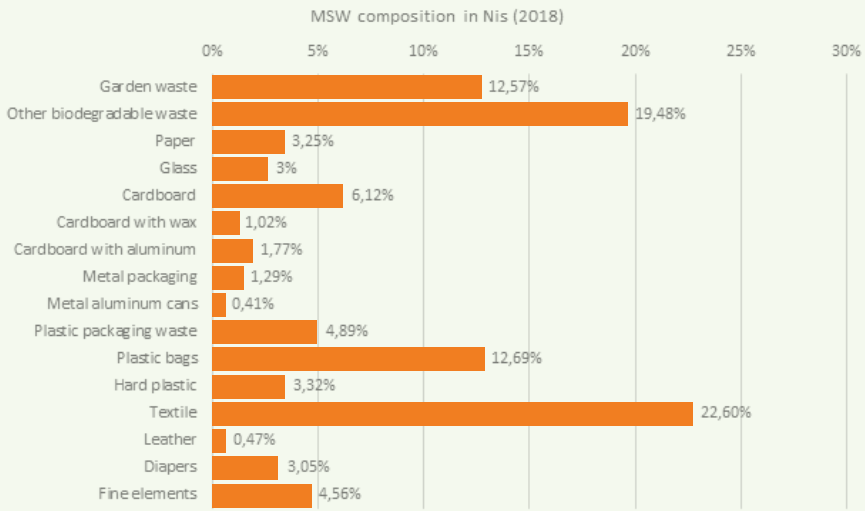


Chart 53. Municipal waste composition in the City of Niš, 2018

6.19 Municipality of Cajetina (Serbia)

A total of 14.745 inhabitants live in the Municipality of Cajetina. The total surface area is 647 km^2, out of which 3,3% is urban, with 42% of the population living there. The remaining 58% of the population lives in rural areas, which account for 96,7% of the total territory. 100% of the population in both urban and rural areas is covered with waste collection services.

Municipal waste generation per capita is 1,35 kg/day. The packaging waste collection service is not implemented and there is no recycling in the municipality. Waste is mainly composed of fine elements and residual (23,85%) followed by biodegradable waste (11,01%) and cardboard with wax (11,01%).

The waste management fee is 0,07 EUR/m3 of household and consists of costs for waste collection, transport, disposal and sweeping of streets. Waste bills are separated from other communal services. The fee is uniform for both urban and rural areas. The entity responsible for waste management fees collection is the Public Utility Company. The overall waste management fee collection ratio has not been reported. The informal waste collection sector is not present in this municipality.

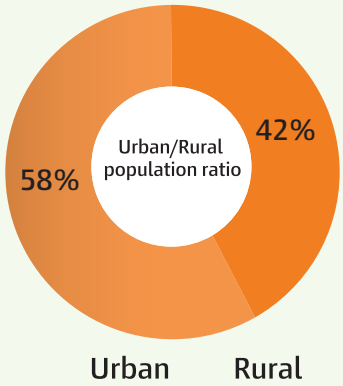


Chart 54. Population in urban vs rural areas in Čajetina

Waste from Municipality of Cajetina is disposed of at the sanitary landfill Duboko and 1 non-compliant landfill. Data on wild dumps is not available. There are 2 landfills for inert waste.

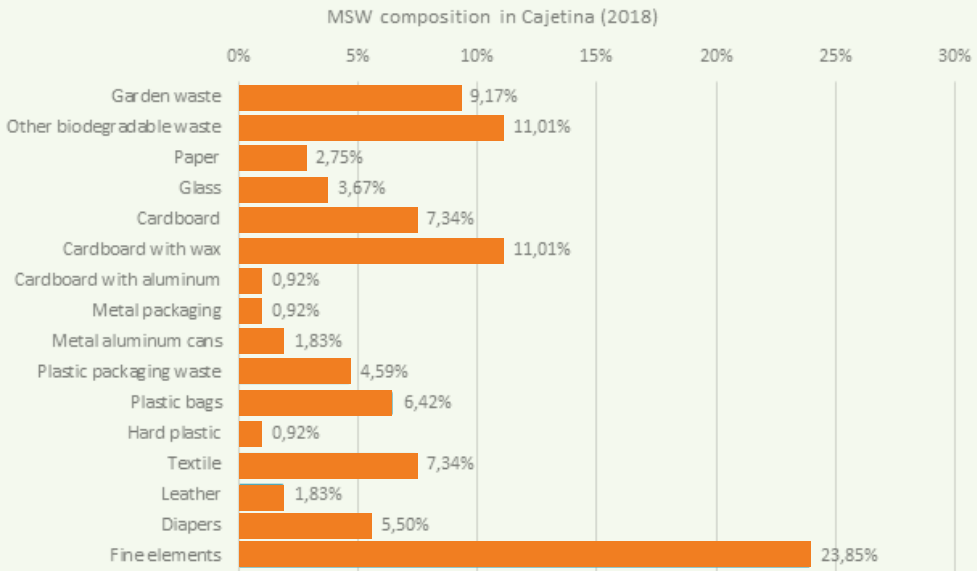


Chart 55. Municipal waste composition in Čajetina, 2018

6.20 Municipality Kartepe in Kocaeli (Turkey)

A total of 118.066 inhabitants live in the Municipality of Kartepe. The total surface area is 269 km2 and is 100% urban area. 100% of the population is covered with waste collection services including packaging waste collection services.

Municipal waste generation per capita increased from 0.83 kg/day in 2015 to 0.96 kg/day in 2018. The recycling rate in Kartepe is reported as 19%, which is 25% higher than in 2015. Waste is mainly composed of biodegradable waste (67,2%) fine elements (12,2%) and plastic packaging (11,35%).

Turkey has a different method of calculating its waste management fee, which is tied to water consumption. Every household must pay "Environmental Cleaning Tax", and in practice, it is identical to the waste management fee in other countries, since this tax is only applicable to households with water consumption bills. The waste fee is calculated as 0.07 EUR per each m3 of water consumed. Other than households, enterprises need to pay regular management fees decided by the municipality. The municipality is responsible for the collection of "waste management fees", and the overall collection rate is around 100%.

The informal waste collection sector operates in the municipality, consisting of persons with low-income level, low level of formal education and unskilled persons, as well as economic immigrants. They pick waste from solid waste containers and bins. The sector is not recognized by the local government authorities. The Turkish law forbids waste collection outside the officially registered companies that are part of the national waste management system. However, municipalities struggle with the enforcement of this law.

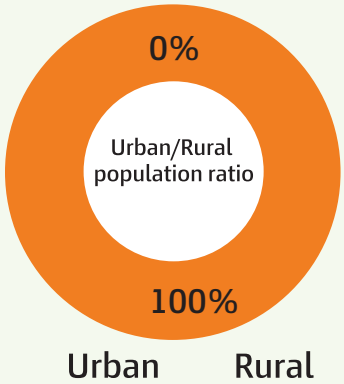


Chart 56. Population in urban vs rural areas in Kartepe

Waste pickers mainly collect paper and PET plastics; however, the exact quantities of waste collected are not available. The involvement of the informal sector is very significant and takes into account the collection of valuable recyclables.

The municipality of Kartepe is disposing of its municipal solid waste at a regional sanitary landfill belonging to the Metropolitan Municipality of Kocaeli. The Municipality has one landfill for inert waste.

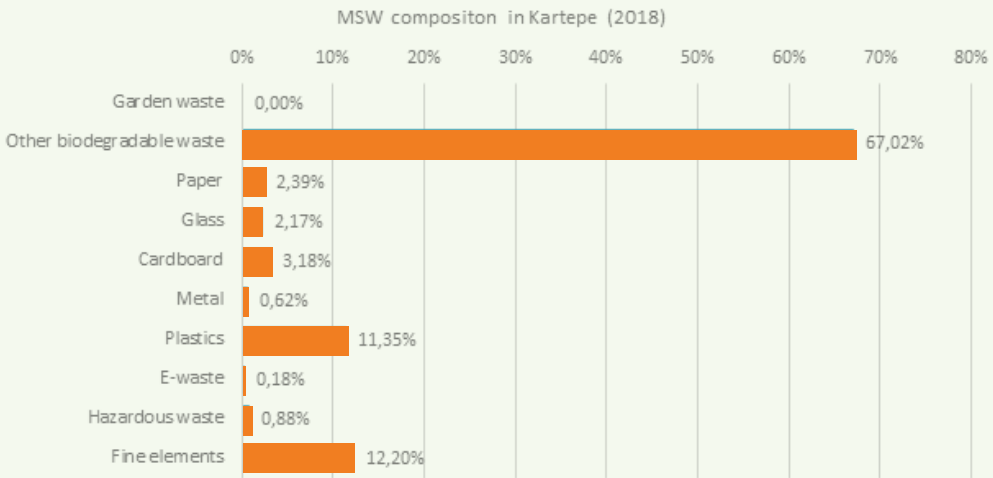


Chart 57. Municipal waste composition in Kartepe Municipality, 2018

6.21 Municipality Uzunkopru in Edirne (Turkey)

A total of 61.485 inhabitants live in the Municipality of Uzunkopru. The total surface area is 1,215 km2, out of which 16% is urban, with 64% of the population living there. The remaining 36% of the population lives in rural areas, which account for 84% of the total territory. The whole municipality is covered with waste collection services and around 64% of the population is covered with packaging waste collection services.

Municipal waste generation per capita keeps the trend of decreasing even though the difference is small, from 1.35 kg/day in 2015 to 1,33 kg/day in 2018. The recycling rate in Uzunkopru is constantly increasing. It is higher for 26% from the last report and makes it up to 52,1%, in 2018. Waste is mainly composed of biodegradable waste (29.8%), fine elements (26.3%) and plastic packaging (10,2%).

Turkey has a different method of calculating its waste management fee, which is tied to water consumption. Every household must pay "Environmental Cleaning Tax", and in practice, it is identical to the waste management fee in other countries, since this tax is only applicable to households with water consumption bills. The waste fee is calculated as 0.20 EUR per each m3 of water consumed which is higher from 0,06 EUR/m3 reported in 2015. Other than households, enterprises need to pay regular management fees decided by the municipality. The municipality is responsible for the collection of "waste management fees", and the overall collection rate is around 55,6 %.

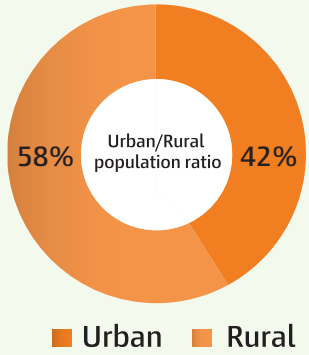


Chart 58. Population in urban vs rural areas in Uzunkopru

The informal waste collection sector operates in the municipality, consisting of persons with low-income level, low level of formal education and unskilled persons as well as unemployed persons. They pick waste from solid waste containers and bins and at the landfill. The sector is not recognized by the local government authorities. The Turkish law forbids waste collection outside the officially registered companies that are part of the national waste management system. However, municipalities struggle with the enforcement of this law.

Waste pickers mainly collect paper and PET plastics; however, the exact quantities of waste collected are not available. The involvement of the informal sector is very significant and takes into account the collection of valuable recyclables.

The municipality of Uzunkopru is disposing of its municipal solid waste at one non-compliant landfill while its new regional landfill is under construction. The Municipality has one landfill for inert waste.

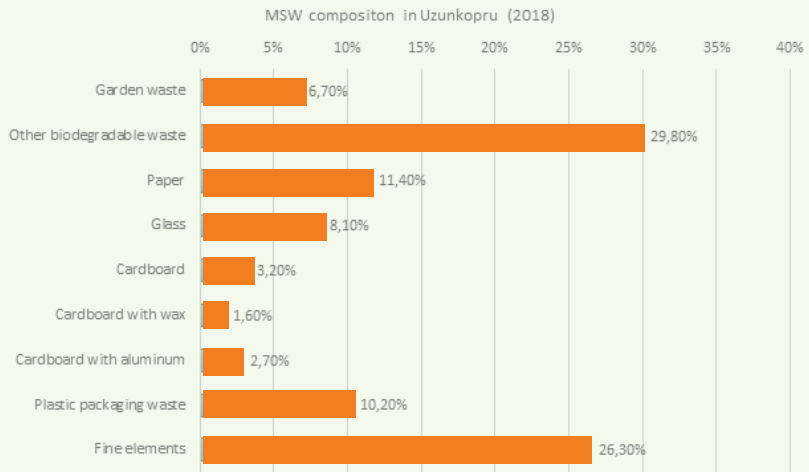


Chart 59. Municipal waste composition in Uzunkopru Municipality, 2018

7. BENCHMARKING OF LOCAL INDICATORS

7.1 Indicator 1: Population number

Benchmarking Report on SWM for 2018 has sample municipalities in the range from 10.000 to 350.000 inhabitants (Chart 59). Although the indicator on the number of inhabitants has no benchmark value it represents the variety of the Region and it is used for calculating other indicators. There are two sample municipalities from each country presented in the Report, except for Romania. The Report aims to follow up trends and target the changes in the same sample municipalities over several years.

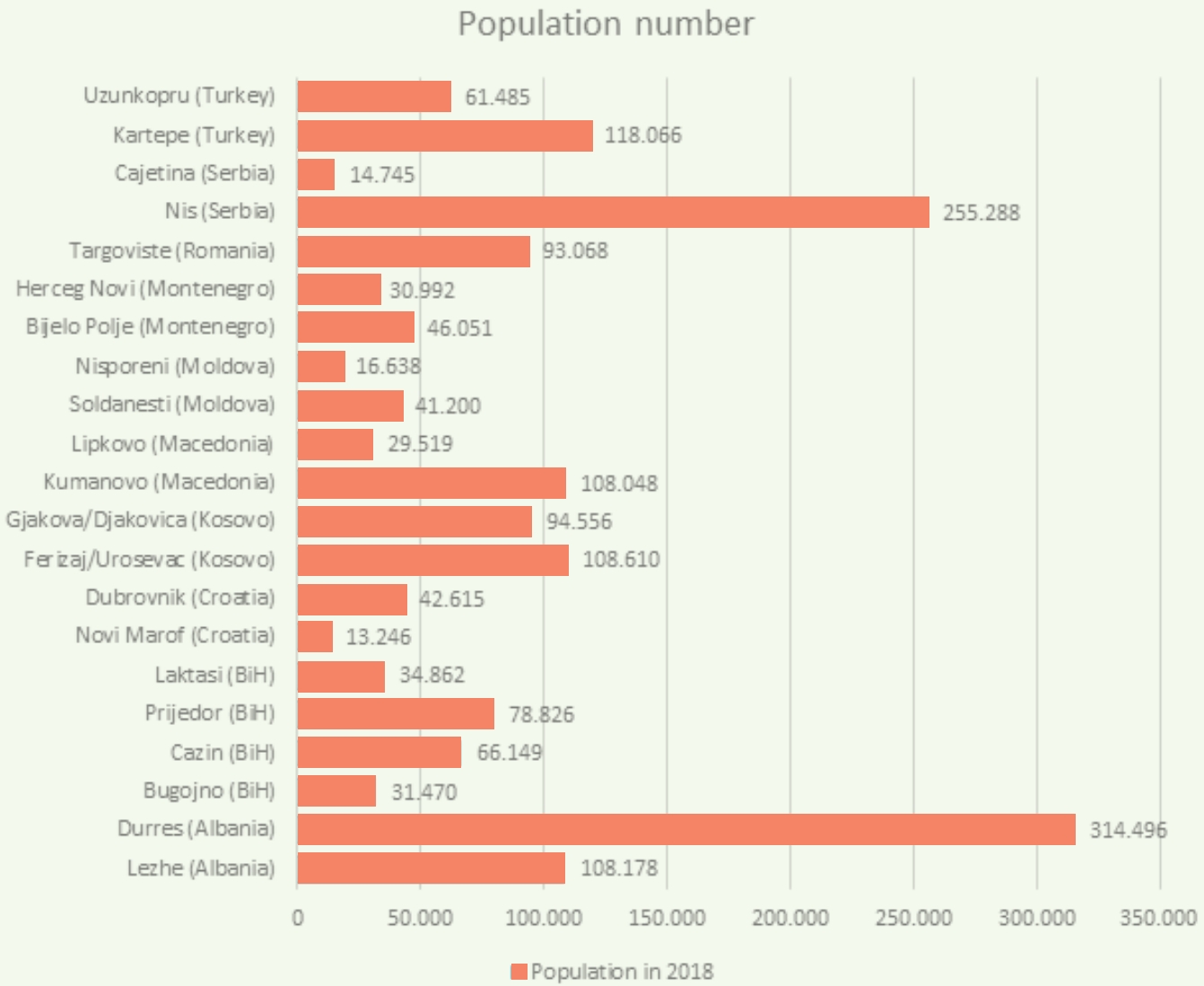


Chart 60. Population number in sample municipalities

7.2 Indicator 2: Urban/Rural ratio

The Urban/Rural ratio indicator provides information on the level of urbanization of areas to be included in SWM services. The information on the type of municipality regarding urbanization is interesting to follow keeping in mind that providing SWM services in rural areas is usually more difficult and more expensive. Even though most of the sample municipalities are dominantly rural, except for Kumanovo, Targoviste, and Kartepe, these areas don't need to be largely populated. Chart 60 provides an urban/rural ratio by the surface of the area, while chart 61 gives insight on the density of the population in these areas.

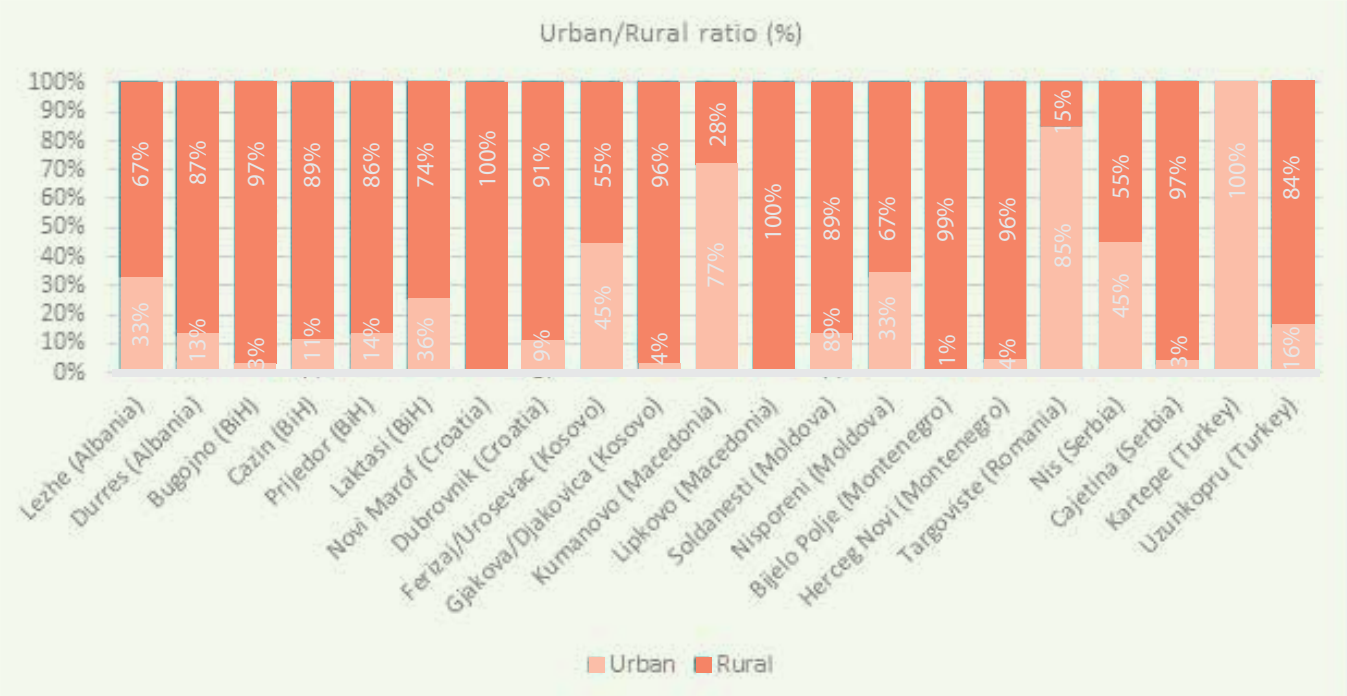


Chart 61. The ratio between rural and urban areas

7.3 Indicators 3 and 4: Ratio between population living in urban and rural areas

One of the criteria defined in the methodology for benchmarking in SWM was this indicator – Ratio between population living in urban areas vs. population living in rural areas. The complexity of establishing and providing SWM services in areas with different levels of urbanization, population density, distance, etc. are reflected in different practices and costs. Therefore, there are two sample municipalities for each country presented in the Report, one with population dominantly living in the urban area and other with population dominantly living in the rural area.

The majority population in Kumanovo, Dubrovnik, Durres, Nisporeni, Târgoviște, and Herceg Novi lives in urban areas, while the majority population in Soldanesti, Cazin, Laktasi, Bijelo Polje, Nis, and Lezhe lives in rural areas. Municipalities with balanced urban and rural populations are Bugojno, Prijedor, Ferizaj/Urosevac, Cajetina, and Uzunkopru. Bijelo Polje is 99% rural with 78% of the population living there. Lipkovo and Novi Marof are municipalities considered to be 100% rural because the entire population lives in the rural area. Kartepe is the only municipality reported to be 100% urban thus its entire population lives in the urban area.

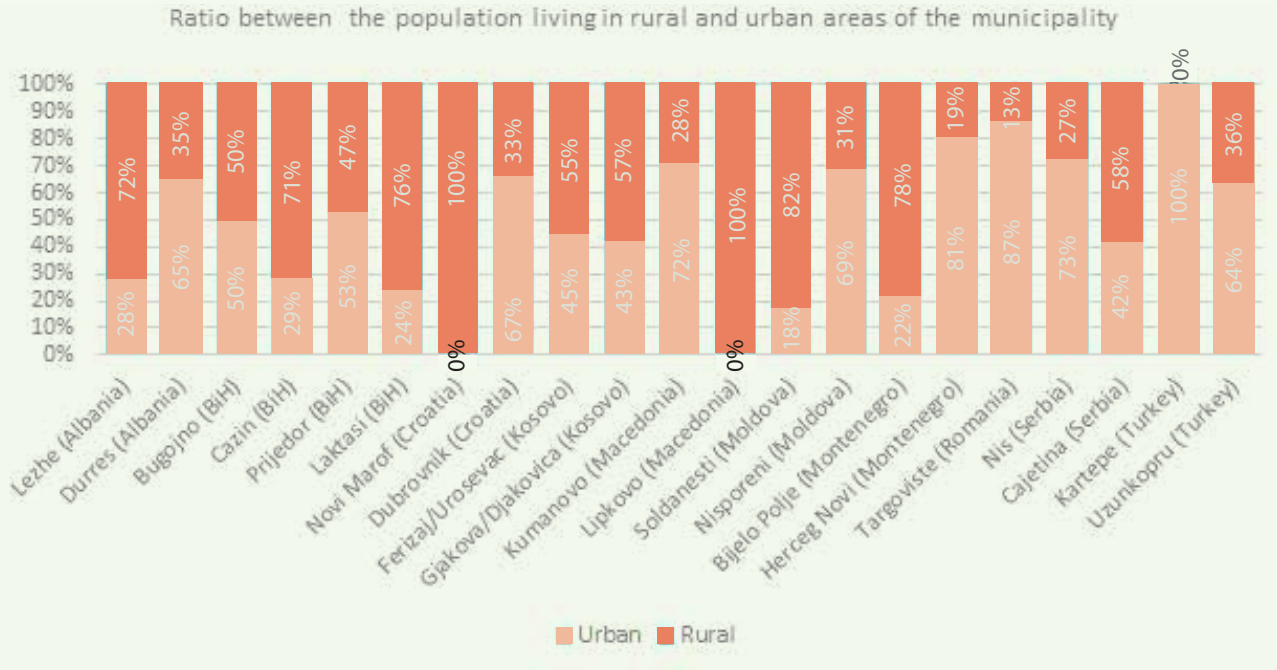


Chart 62. The ratio between the number of population living in rural and urban areas

7.4 Indicator 5: Municipal solid waste generation per capita

When describing SWM services the most important indicator is municipal waste generation per capita. It can be expressed as kilograms per person per year or per day. This indicator is extremely important not just for comparison, it is assumed that the development of economy and municipal waste generation are closely related but also for any kind of planning in the area of solid waste management.

It has been noticed that the majority of sample municipalities have increased waste generation per capita: Bugojno, Laktasi, and Kumanovo with significant increase while Lezhe, Durres, Soldanesti, Nisporeni, Herceg Novi and Kartepe with a slight increase compared to the 2015 year. Other municipalities reported lower waste generation per capita compared to the 2015 year, where Ferizaj/Urosevac has the biggest difference (from 1,15kg/cap/day to 0,83kg/cap/day).

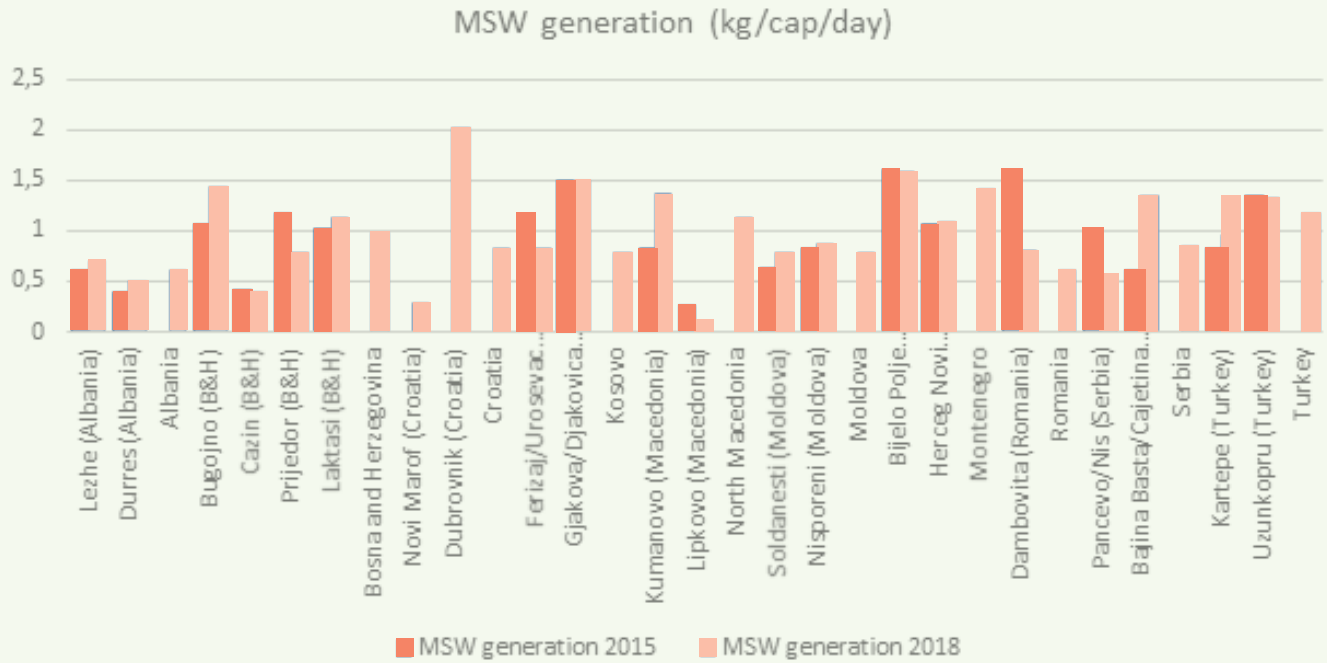


Chart 63. MSW generation in observed municipalities (2015-2018)

Municipalities with lowest waste generation per capita are: Lipkovo (0.10 kg/cap/day), Novi Marof (0,29kg/cap/day), Cazin (0,39 kg/cap/day) Durres (0,5 kg/cap/day), and Nis (0,56 kg/cap/day). Except for Durres and Nis, all other municipalities are mainly rural, with Lipkovo and Novi Marof being 100% rural municipalities. The largest waste production is reported for Dubrovnik (2,01 kg/cap/day), Bijelo Polje (1,58 kg/cap/day) and Bugojno (1,44 kg/cap/day). These are the municipalities with most of their inhabitants living in the urban area except for Bugojno which has population divided equally between urban and rural areas. Even though it was assumed that there is a correlation between population living in the urban area and municipal waste generation per capita it is not the case for all municipalities.

However, since the discrepancies are not large we might consider the trend established, especially when we keep in mind that not all data on municipal waste generation per capita are exact and derived from established methodologies and procedures.

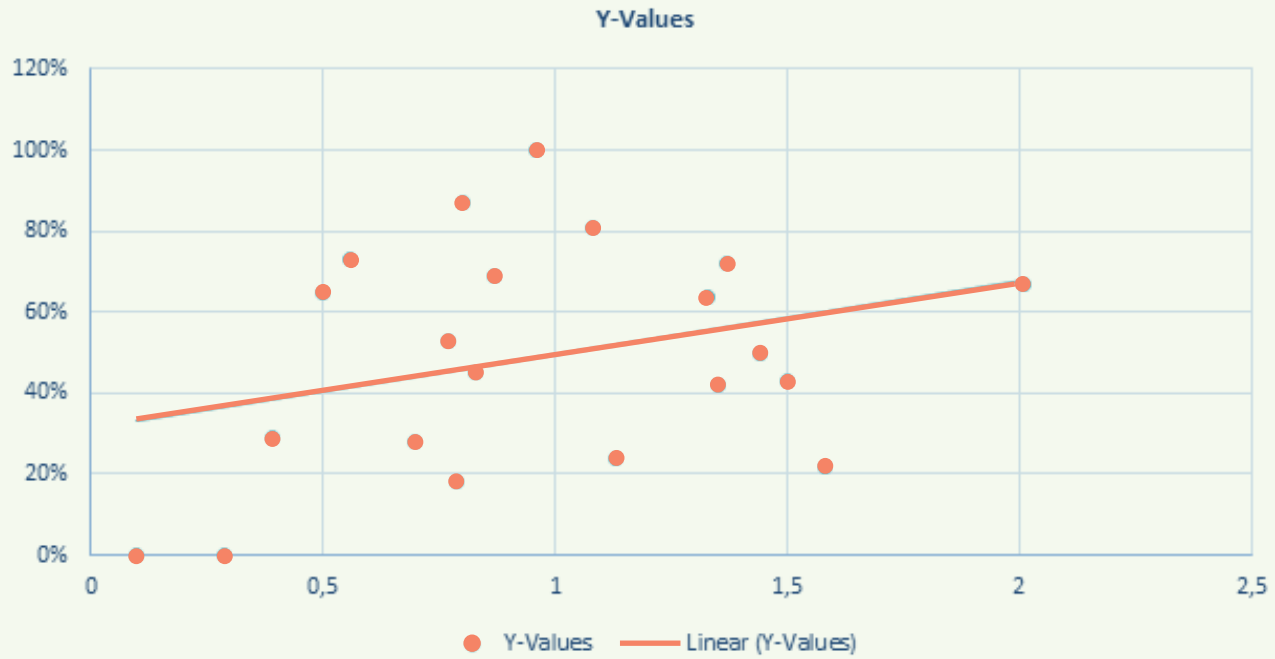


Chart 64. Correlation between urban population and MSW generation per capita

7.5 Indicator 6: Waste composition

The knowledge of waste composition in the municipality is of the importance mostly to decision-makers for planning waste management infrastructure and implementation of different waste management services such as separation at source, recycling, composting, etc. The waste composition indicator represents the share (%) of specific components in the municipal waste stream such as glass, metal, organic material, paper, plastic, etc. According to the NALAS 2015 project "Solid Waste Data Collection in SEE", 16 categories of waste were recognized by the Methodology while there were few more added in the reporting by some municipalities. The data provided for most of the municipalities except for Durres, Laktasi, and Nisporeni. Some data are provided according to the best knowledge of waste management representatives and some according to the average for countries reported in waste management strategies (e.g. Novi Marof, Dubrovnik).

Information on waste composition was not available for the Municipalities of Durres, Laktasi, and Nisporeni. The waste composition indicator for Cazin and Prijedor Municipalities is calculated based on real measurements according to the standard methodology developed in the NALAS Project "Solid Waste Data Collection in SEE".

The garden and other biodegradable waste is the main component of municipal waste with over 50% as expected except for Bugojno. It has been recognized that municipalities that are implementing packaging waste collection services and recycling are keener to report precise figures for recyclables in waste composition. There has not been established any difference between waste composition for municipalities with the predominantly urban or rural population.

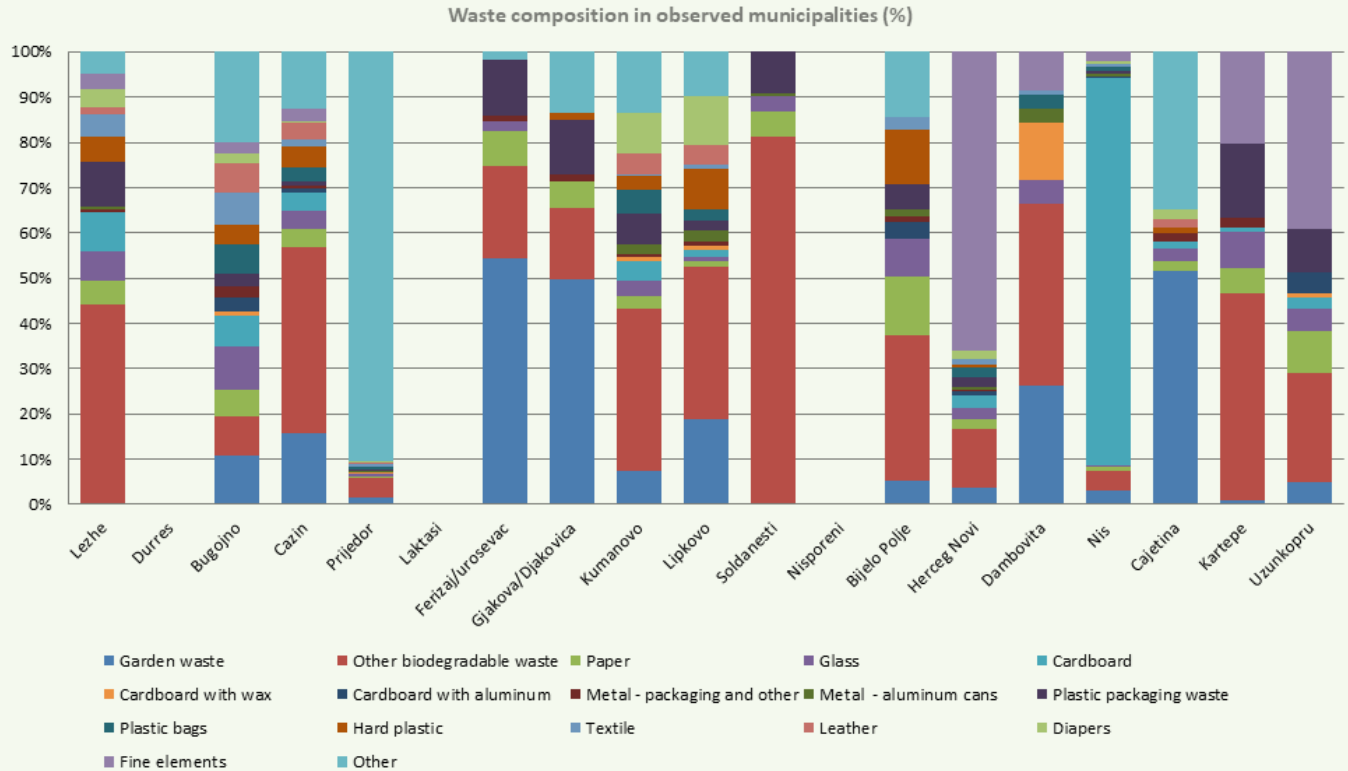


Chart 65. Waste composition of observed municipalities

7.6 Indicator 7: Population covered with municipal solid waste collection services (%)

This indicator represents the % of the population living in the municipality provided with the service of the waste collection either by door-to-door or street container systems. The benchmark value for this indicator is 100%. When the value is less than 100% than it implicates that some amount of waste ends up on illegal dumps and in the environment.

Service coverage has improved since 2015 but still not at a satisfactory level. Now we have 5 municipalities with 100% coverage of their territory and other 5 with coverage over 90%, all out of 21 municipalities. The lowest rate for waste collection coverage is found in Soldanesti and Nisporeni, followed by Bijelo Polje, which has improved since the 2015 report. It is not usual that service coverage decreases in time, but that has been reported for municipalities of Lezhe, Soldanesti, and Nisporeni.

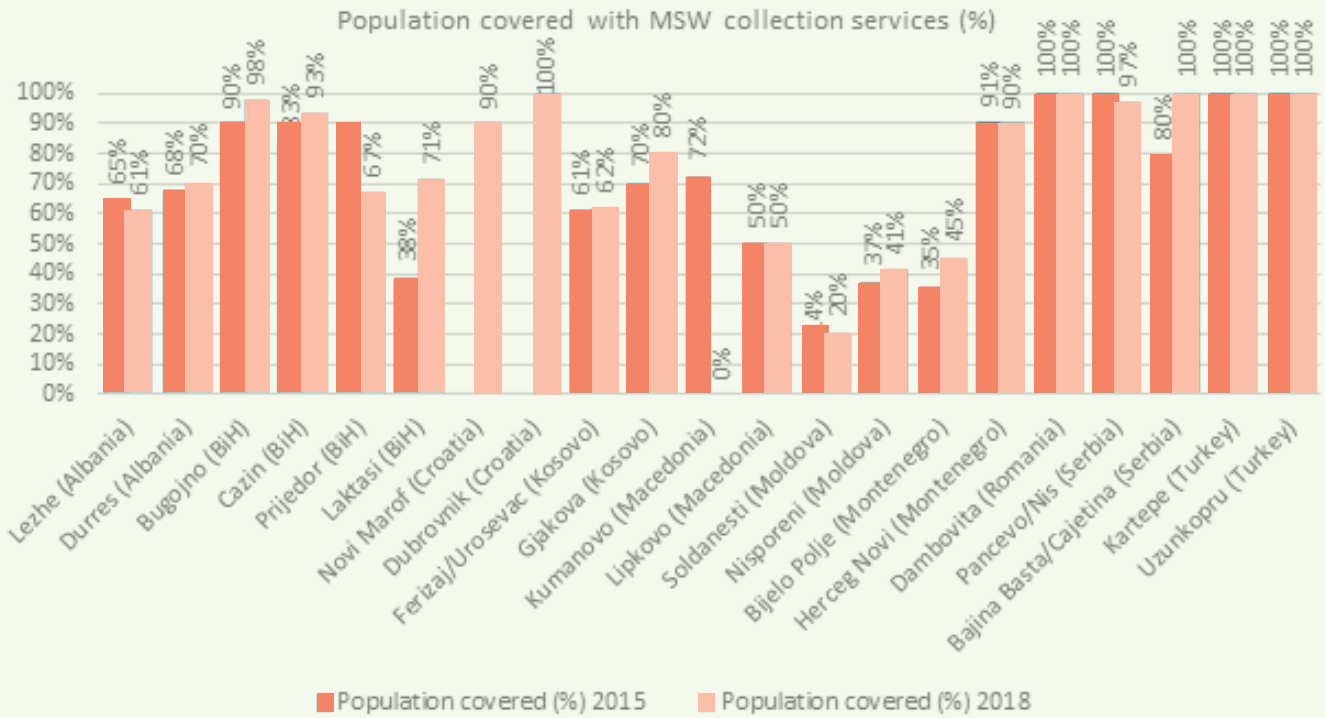


Chart 66. Population covered with service of waste collection in sample municipalities

7.7 Indicator 8: Population covered with municipal solid waste collection services in urban areas

This indicator represents the % of the population living in the urban area of a municipality which is provided with the service of waste collection. This indicator includes households covered by door-to-door collection and households covered by a container collection system. The benchmark value for this indicator is 100%. If the value is less than 100%, waste is not collected and most probably ends up at illegal landfills, exposing people to health risks.

Except for Lipkovo and Novi Marof, which is a 100% rural municipality and therefore not in this chart, all other municipalities succeed to provide full collection service in their urban areas. The least covered are the Municipalities of Nisporeni (50%) and Soldanesti (42%), while all other municipalities have coverage of 90% and more. A total of 13 municipalities have 100% coverage of their urban area. The only inconsistency has been recorded for Durres where service coverage has decreased from 100% to 80%, which is very unusual. All municipalities intend to cover 100% of their urban area with waste collection services.

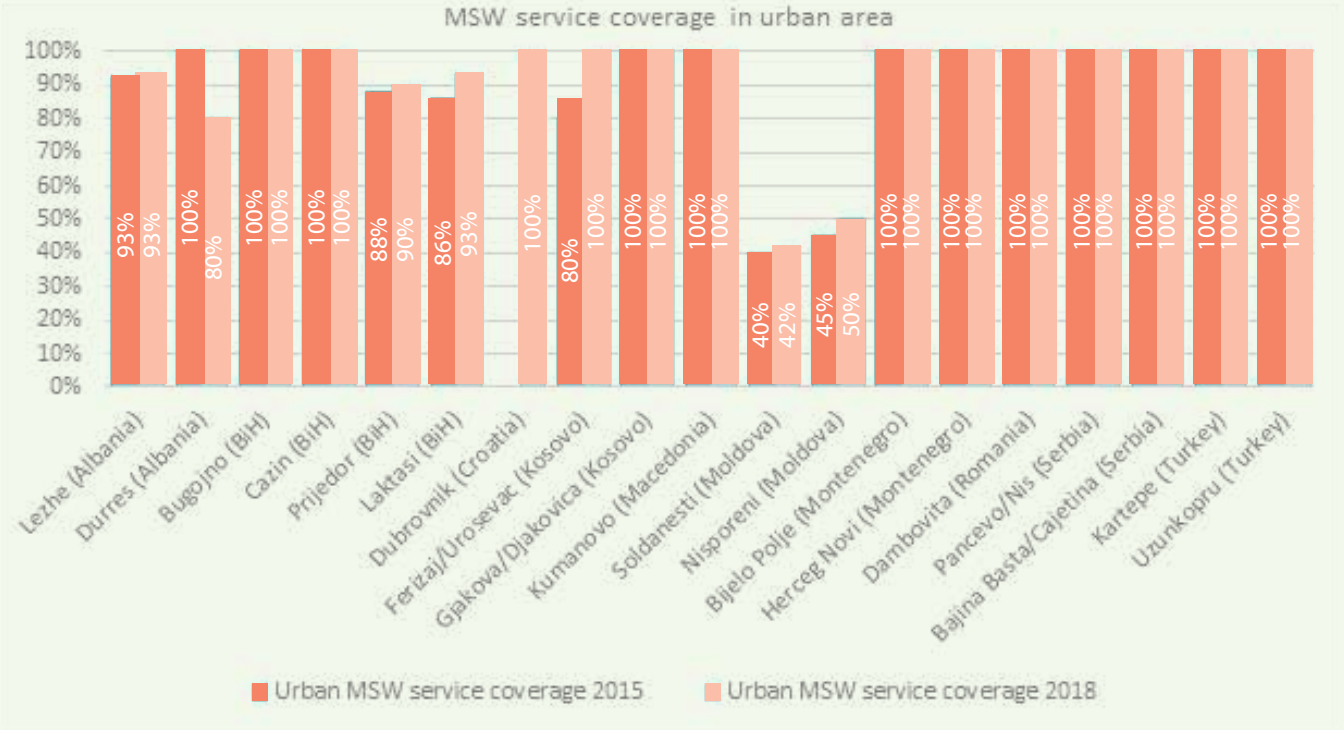


Chart 67. Municipal solid waste service coverage in urban areas of sample municipalities

7.8 Indicator 9: Population covered with MSW collection services in rural areas

This indicator represents the % of the population living in the rural area of a municipality which is provided with the service of waste collection. This indicator includes households covered by door-to-door collection and households covered by a container collection system. The benchmark value for this indicator is 100%. If the value is less than 100%, waste is not collected and most probably ends up at illegal landfills, exposing people to health risks.

All municipalities have shown improvement in broadening waste collection services in rural areas compering to the last report in 2015 but the overall image is still not satisfactory and reflects the fact that still a large amount of uncollected waste ends up in illegal dumps endangering the environment. Municipalities, where most of the population lives in rural areas, are Lezhe, Cazin, Laktasi, Novi Marof, Lipkovo, Soldanesti, and Bijelo Polje. 8 municipalities have reported coverage of 100% or close to it, while the lowest is recorded in Kumanovo (4%), Soldanesti (17%) and Nisporeni (19%). Bijelo Polje has improved since the last report (30%) but it is still unsatisfactory. Municipality of Gjakova/ Djakovica also improved with 60% and Laktasi which has made the greatest improvement from 25% to 74% in this year's report. The Municipality of Kartepe is 100% urban, thus it is not used for benchmarking for this indicator.

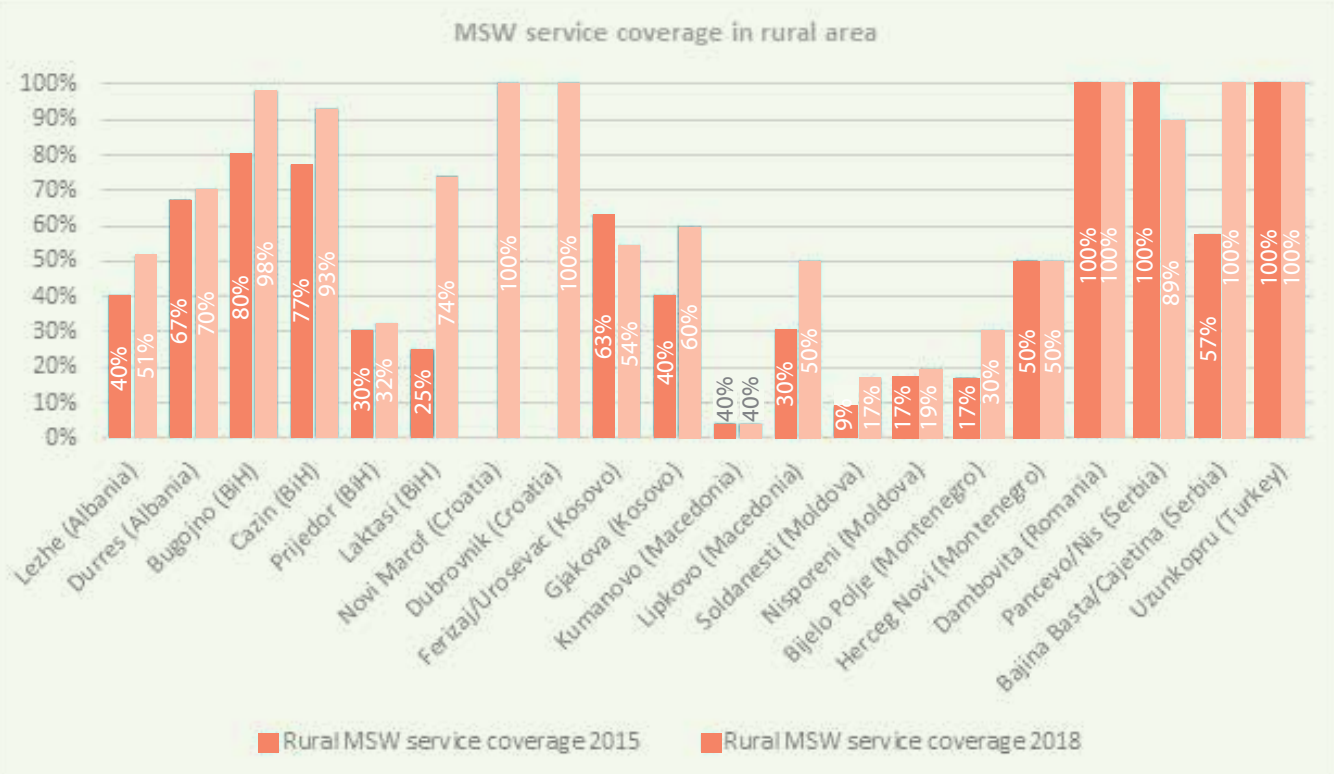


Chart 68. Municipal solid waste service coverage in rural areas of sample municipalities

7.9 Indicator 10: Population covered with packaging waste collection services

This indicator represents the % share of the population covered by a packaging waste collection system. Separation of waste is a critical requirement for sustainable solid waste management systems and one of the first steps in the implementation of the circular economy because it is a precondition for recycling, reuse and resource recovery in treatment units. All waste producers should be covered by a packaging waste collection system. The benchmark value for this indicator is 100%.

The packaging waste collection service remains one of the challenging indicators. There is still a large number of municipalities where that service has not been reported at all. However, there are some very good examples where this service has been introduced since 2015 (e.g. Lezhe and Cazin). Among the municipalities with presented packaging waste service rates, Cazin, Dubrovnik, Targoviste, and Kartepe reported that their entire municipality is covered by a packaging waste collection system. This indicates that mixed waste containers are coupled with packaging waste containers and that all inhabitants can separate waste at its source. Other municipalities are also introducing waste separation at source, where Gjakova/Djakovica is the municipality that advanced most in this sense, with 85% coverage followed by Herceg Novi (74%), Novi Marof (65%), Uzunkorpu and Lezhe with 64% both.

Chart 69. Population in sample municipalities covered with packaging waste collection services

7.10 Indicator 11: Recycling rate

This year's Report on Benchmarking in SWM has been dedicated to Circular Economy and the basis for switching from linear to the circular economy in the waste management sector is the implementation of recycling expressed in the recycling rate. The recycling rate is the percentage of recyclables that are collected and recycled divided by the total number of recyclables generated. That said very poor data on recycling in sample municipalities is showing that the circular economy is still far from implementation in the waste management sector in the SEE.

The only municipalities showing data for recycling rate and therefore deriving part of the waste from final disposal sites are Lezhe, Cazin, Prijedor, Laktasi, Novi Marof, Dubrovnik, Gjakova/Djakovica, Soldanesti, Herceg Novi, Targoviste, Nis, Kartepe and Uzunkorpu, 13 out of 21. Unfortunately, only 6 out of these 13 have reported a significant recycling rate of over 20%. The highest recycling rates have Uzunkorpu 52,10%, Targoviste 30% and Novi Marof, 32,89%. Dubrovnik, Kartepe and Herceg Novi are close to that with20%, 19%, and 17% respectively.

When comparing recycling rates for pilot municipalities with their national recycling rate, significantly, a discrepancy is notable for Kosovo, where there is no recycling rate on national level reported and on the other hand for North Macedonia and Moldova who's representing pilot municipalities do not have any recycling implemented while it is present on national level.

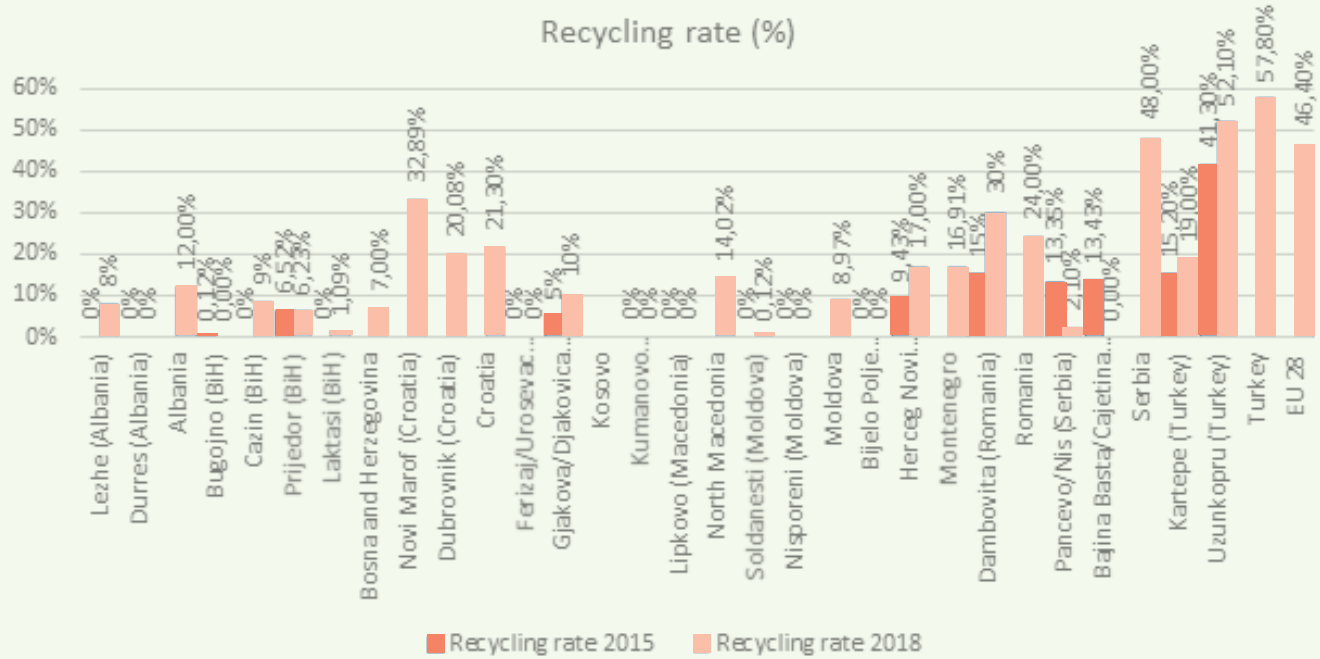


Chart 70. The recycling rate in sample municipalities

7.11 Indicator 12: Waste management fee

The waste management fee indicator has no benchmark value and serves only to give an insight into the overall situation within the region. The indicator consists of data about costs that are calculated in the monthly fee, pricing methods for the waste management service, billing method and waste management fee collection ratio. The main target in the sector is good, cost-covering service accessible to all, but this indicator does not cover all the elements for that calculation, but merely provide a frame of funding.

The most common pricing method is still m^2 of the household regardless of the amount of waste. Some municipalities reported differences in pricing in rural areas where a mostly flat rate is charged (e.g. Bugojno, Kumanovo and Targoviste). The only most precise tariffing method is implemented in Croatian municipalities Novi Marof and Dubrovnik. They have a combination of fix and variable parts of tariff all depending on the quantity of waste and they also reported differences in price for urban and rural households. Unlike the rest of the municipalities, Kartepe and Uzunkorpu base their tariffing method upon the quantity of monthly consumed water, although it is used some part for waste management of all environmental cleaning tax, it is not a waste management fee. Targoviste Municipality is the only example where legal entities (companies) are charged by the "Pay-as-You-Throw" system—weight or volume of collected solid waste in kg or m^3 or L. Kartepe and Targoviste have reported 100% fee collection ratio. Urban areas have a higher collection rate than rural areas.

Municipality	Waste management fee (Urban)	Waste management fees collection ratio
Lezhe (Albania)	2,64 EUR/month	85% urban 35% rural
Durres (Albania)	1.6 EUR/month	45% urban 15% rural
Bugojno (B&H)	0.06 EUR/m^2 3,5 EUR/household/month	85%—total
Cazin (B&H)	4.09 EUR/month	87%—total
Prijedor (B&H)	0.068 EUR/m^2	N/A
Laktasi (B&H)	6 EUR/month	78%—total
Novi Marof (CRO)	3,40 EUR to 13,60 EUR (fixed part) + 0,01 EUR/L (variable part)	90%
Dubrovnik (CRO)	3,40 EUR to 13,60 EUR (fixed part) + 0,02 EUR/L/m^2 (variable part)—urban 3,40 EUR to 13,60 EUR (fixed part) + 0,01 EUR/L/no. of collections (variable part)—rural	98%
Ferizaj/Urosevac (Kosovo)	4.65 EUR/month	88,36%—total
Gjakova/Djakovica (Kosovo)	4.65 EUR/month	100%— urban 60%—rural
Kumanovo (Macedonia)	0.0488 EUR/m^2 – urban 3 EUR/household – rural	N/A
Lipkovo (Macedonia)	2.44 EUR/m^2	N/A

Municipality	Waste management fee (Urban)	Waste management fees collection ratio
Soldanesti (Moldova)	0.70 EUR/m² – urban 0.40 EUR/m² – rural	98%—urban 97%—rural
Nisporeni (Moldova)	0.51 EUR/ household/month	71,2%—urban 68,4%—rural
Bijelo Polje (Montenegro)	0.065 EUR/m²	75%—total
Herceg Novi (Montenegro)	0.06 EUR/m²	91%—total
Târgoviște (Romania)	2,5 EUR/cap/month – urban 1,5 EUR/household/month – rural	100%—total
Nis (Serbia)	0.04 EUR/m²	97,3% -total
Cajetina (Serbia)	0,07 EUR/m²	N/A
Kartepe (Turkey)	0,07 EUR/m³ of water	100%-total
Uzunkopru (Turkey)	0,20 EUR/m³ of water	55,6%—total

Table 21. Waste management fees and collection rate in sample municipalities

7.12 Indicator 13: Informal sector in solid waste management

The "informal sector in solid waste management" refers to individuals, families, and the private sector (micro) enterprises providing waste management services and valorization of waste, whose activities are neither organized, sponsored, financed, contracted, recognized, managed, taxed nor reported upon by the formal solid waste authorities.

The informal sector in solid waste management is present in almost all sample municipalities except for Novi Marof, Dubrovnik and Cajetina. In general, waste pickers are not recognized by the authorities or legal framework. The waste law in Turkey and Montenegro forbid individuals and unofficial organizations outside the waste management system to provide these services. However, municipalities have issues with the enforcement of these regulations.

Informal waste pickers are found in low-income communities with income below the poverty line, among unemployed people and homeless people. The most common type of waste collected by informal waste pickers is metal and PET and paper waste, which is collected from waste bins and directly at landfills and sold to buyers on the waste market. This informal sector is more a social and less an environmental issue in the observed municipalities. Municipalities and public utility companies do not have data on the amount of waste collected by these individuals. However, the general opinion is that their activities are of low significance to municipalities.

Municipality	Recognition of SWM informal sector by government	SWM informal sector social groups	Most desired type of waste for SWM informal sector
Lezhe (Albania)	No	- Low income communities below the poverty line - Persons with low level of formal education - Unemployed people	- Paper - Hard Plastic - Metal - Glass
Durres (Albania)	No	- Low income communities below the poverty line - Unemployed people - Women and children	- Metal - Plastic - Paper
Bugojno (B&H)	No	- Low income communities below the poverty line - Unemployed people - Homeless people	- Metal - PET
Cazin (B&H)	No	- Low income communities below the poverty line - Unemployed people - Homeless people	- Metal - PET
Prijedor (B&H)	No	- Low income communities below the poverty line - Unemployed people	- Metal - PET - Paper
Laktasi (B&H)	No	- Low income communities below the poverty line - Unemployed people	- Metal - PET
Novi Marof (CRO)	No	No observed SWM informal sector	n/a
Dubrovnik (CRO)	No	No observed SWM informal sector	n/a
Ferizaj/Urosevac (Kosovo)	No	- Low income communities below the poverty line - Unemployed people	- Metal - PET
Gjakova/Djakovica (Kosovo)	No	- Low income communities below the poverty line - Unemployed people - Homeless persons	- Metal - Paper - PET
Kumanovo (Macedonia)	No	- Low income communities below the poverty line - Unemployed people - Homeless persons	- Metal - PET
Lipkovo (Macedonia)	No	- Low income communities below the poverty line - Unemployed people - Homeless persons	- Metal - PET
Soldanesti (Moldova)	No	- Low income communities below the poverty line - Unemployed people - Homeless persons	- Metal - PET
Nisporeni (Moldova)	No	- Low income communities below the poverty line - Unemployed people - Homeless persons	- Metal - Plastic - PET
Bijelo Polje (Montenegro)	Yes	- Persons with low level of formal education - Unskilled persons	- Metal - PET
Herceg Novi (Montenegro)	Yes	- Persons with low level of formal education - Unskilled persons	- Metal - PET
Targoviste (Romania)	No	- Low income communities below the poverty line	- Metal - PET
Nis (Serbia)	No	- Persons with low income - Unemployed people - Women and children	- Metal - PET

Municipality	Recognition of SWM informal sector by government	SWM informal sector social groups	Most desired type of waste for SWM informal sector
Cajetina (Serbia)	No	No observed SWM informal sector	n/a
Kartepe (Turkey)	No	- Low income communities with incomes below the poverty line - Persons with low level of formal education and unskilled persons - Economic immigrants	- Paper - PET
Uzunkopru (Turkey)	No	- Low income communities with incomes below the poverty line - Persons with low level of formal education and unskilled persons - Unemployed persons	- Paper - PET

Table 22. The informal sector in solid waste management, in sample municipalities

7.13 Indicator 14: Land disposal sites for solid waste

Struggling with insufficient funding of waste management infrastructure in the SEE region, this indicator provides an improvement in the sector over time. This indicator represents the number of waste disposal sites in the sample municipality. The benchmark target is to have 0 non-compliant municipal landfills, 0 illegal dumpsites and that all waste is disposed at sanitary landfills, while inert waste is disposed of inert waste landfills.

Municipality	Sanitary landfills	Non-compliant municipal landfills	Illegal dumpsites	Inert waste landfills
Lezhe (Albania)	1—Bushat	N/a	N/a	N/a
Durres (Albania)	1—Porto Romano	1	4	N/a
Bugojno (B&H)	0	1 – Dubočine – Talin Gaj	18	N/a
Cazin (B&H)	0	1 – Medžare – Vlaški Do	25	N/a
Prijedor (B&H)	1—Kurevo, still under construction	1	N/a	N/a
Laktasi (B&H)	1 -Ramići – Banja Luka	N/a	7	N/a
Novi Marof (Croatia)	1—Kurjakana	n/a	n/a	n/a
Dubrovnik (Croatia)	0	1—Grabovica	n/a	n/a
Ferizaj/Urosevac (Kosovo)	1 – Gjilan	N/a	44	N/a

Municipality	Sanitary landfills	Non-compliant municipal landfills	Illegal dumpsites	Inert waste landfills
Gjakova/Djakovica (Kosovo)	Only transfer station "Kolonia"	N/a	10	N/a
Kumanovo (Macedonia)	N/a	1	16	N/a
Lipkovo (Macedonia)	N/a	1	8	N/a
Soldanesti (Moldova)	N/a	10	N/a	N/a
Nisporeni (Moldova)	N/a	1	3	N/a
Bijelo Polje (Montenegro)	N/a	1	54	N/a
Herceg Novi (Montenegro)	N/a	1	8	N/a
Targoviste (Romania)	2 – Aninoasa, Titu	0	0	0
Nis (Serbia)	n/a	1	90	1
Cajetina (Serbia)	1 – Duboko	1	N/a	2
Kartepe (Turkey)	1—Kocaeli	0	0	0
Uzunkopru (Turkey)	Under construction	1	0	0

Table 23. Landfill data in observed municipalities

Unfortunately, there is not much improvement in the region regarding this indicator. Only Municipality of Laktasi now disposes their waste to regional sanitary landfill which is a new effort since 2015. All together 9 municipalities out of 21 dispose of their waste on sanitary landfills. Others dispose of waste on non-compliant municipal landfills. There are no illegal dumps in the municipalities that reported 100% coverage with waste collection services (e.g. Dubrovnik, Targoviste, Bajina Basta, Kartepe and Uzunkopru). However Bugojno, Nis and Cazin have coverage with collection service over 93% but still have a notably large number of illegal dumps. On the other and it is not unusual to have illegal dumpsites formed mainly by inhabitants that are not covered with the waste collection service. Landfills for inert waste are reported for only 2 municipalities.

NALAS

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