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WASTE MANAGEMENT STUDY IN THE LIM RIVER COAST IN THE TERRITORY OF THE MUNICIPALITIES OF PRIBOJ AND BIJELO POLJE



LIM

ЈКП
УСЛУГА
ПРИБОЈ

Protection of Polimlje environment from waste



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INTRODUCTORY REMARKS

Rapid economic and technological development has contributed to an increase in emissions of harmful substances in soil, air and water. Pollution is now something that has become a daily occurrence in the modern world. In the age of globalization in which we live, the characteristic of the consumer society is the constant purchasing of new things with short period of time that is being used and thrown. This waste has become a serious problem in the world. Waste thrown away at every turn without caring about the environment and the consequences is causing more and more problems.

The main topic of this study is the growing problem today - the pollution of water flows, that is caused also by the accumulation of waste in rivers. Waste can be found next to rivers for various reasons, due to the deposition of natural waste caused by weather conditions, the discharge of materials from industrial plants or due to human neglect (people throw different types of garbage on the coast of rivers). Due to weather conditions, a very large part of the waste ends up in the rivers. In order to prevent this, it is necessary to establish an integrated waste management system. Waste management is based on the context of sustainable development, whose principles are based on effective environmental protection. Inadequate waste management is one of the biggest and most complex problems in environmental protection. The basic directions of waste management are reflected in the direction of creating a sustainable system, reducing waste generation, exploitation of resources and a solution for reducing hazardous waste. It is necessary to take a number of measures that will prevent the emergence and spread of wild landfills, as well as their reclamation and removal. In order to be able to talk about waste management at all, it is necessary to first adopt a whole range of strategies, legal frameworks and decisions that would define how to solve landfill problems.

What is certainly the most important item without which even the legal framework is not valid is the creation of awareness in man that unconscionable disposal of waste near river flows and in other locations that are not prescribed for this is very dangerous for the environment, but above all for human health. This awareness is created precisely by organizing various forums, debates, education about all the consequences of improper waste disposal.

The topic of this study is waste management in the coastal area of the Lim River in the area of 74.7 km between Priboj in the Republic of Serbia and Bijelo Polje in the Republic of Montenegro.

The Lim River, which stretches from the mouth of the Drina River near the Municipality of Rudo in Bosnia and Herzegovina to the confluence of Plav Lake in Montenegro near the municipality of Bijelo Polje, was once the cleanest river in former Yugoslavia. By negligence and human negligence, it has become one of the most polluted rivers in the world. Every year, about 5 tons of various garbage is taken out of it during cleaning actions.

The main objective of this study is related to waste management in its coastal area, i.e., to provide suggestions, advice and recommendations on how to prevent its continuous pollution, in addition to course her cleansing.

The study will consist of two parts the general and the special part. The general part will define the concept of waste, its general division, the waste management strategy in the Republic of Serbia, republic of Montenegro and the EU, while in a separate part they will be processed. The measures that local authorities in Priboj and Bijelo Polje are taking to make this river once again an oasis of nature as it once was.

I. GENERAL PART

1. WASTE - DEFINITION, DIVISION AND WASTE MANAGEMENT SYSTEM

1.1. Defining waste

Waste is defined as any material or object generated in the course of the performance of production, service and other activities, items excluded from use, as well as waste products generated in consumption and which aspects of producers and consumers are not for further use and must be discarded.

Inadequate waste management is one of the biggest problems in terms of environmental protection in the Republic of Serbia, and is solely a consequence of the inadequate attitude of society towards waste. It first appeared in a period of rapid industrialization of a country that was accompanied by a real danger of depletion of strategic resources and a drastic increase in the amount of all types of solid waste. During these events, there was no adequate environmental policy.

1.2. Waste division

Waste can be divided on the basis of several categories:

- by composition;
- by place of occurrence;
- by toxicity.

According to the composition of waste can be divided into: glass, organic waste, plastic, paper, cardboard, cans, electrical and electronic devices, old vehicles, tires, waste oils and lubricants, waste chemicals, paints, batteries, tailings, textiles, metal, wood.

According to the place of origin, the waste can be divided into:

- Municipal waste (household waste and commercial waste, i.e., waste collected from a certain territorial unit in accordance with local self-government plans).

- Scientific waste (household waste collected daily, especially collected hazardous household waste, bulky and garden waste).
- Commercial waste (waste generated in enterprises, institutions and other institutions engaged in services, trade, sports, entertainment, office work other than household and industrial waste).
- biodegradable waste (waste that is suitable for aerobic and anaerobic decomposition such as food, garden waste, paper and cardboard).
- Packaging waste (any packaging or packaging material that could not be used for original purposes other than waste generated during the packaging production process).
- Industrial waste (waste from any industry or from a location where the industry is located except waste from mines and quarries).

According to the toxicity of waste can be:

- Hazardous waste (waste that has at least one property that makes it hazardous: explosiveness, flammability, propensity to oxidation, organic peroxide, acute toxicity, infectivity, corrosion propensity, in contact with air releases flammable substances, in contact with air or water releases toxic substances, contains toxic substances with delayed chronic action, as well as ecotoxic characteristics, packaging in which hazardous waste was or is packaged)
- Non dangerous waste (waste that does not have the characteristics of hazardous waste).
- Inert waste (waste that is not subject to any chemical, physical or biological changes, does not dissolve, does not burn, or react in any other way).

1.3. Integrated waste management system

Waste management is the implementation of prescribed measures with waste handling within the collection, transport, storage, treatment and disposal of waste including the supervision of these activities and the care of waste management facilities after their closure.

High costs, irrational organization, low quality of services, insufficient care for the environment is the result of a devastating situation regarding the organization of waste management in countries which are included in this Study.

In the Republic of Serbia, the only way of waste management relies on local and regional landfills that in country in most cases do not meet even the basic technical- technological and sanitary requirements, and some are even filled. In Serbia, according to the current situation, very few landfills can be included in sanitary landfills.

The integrated management system involves a series of activities and steps that include:

- prevenance of waste formation;

- with a decrease in the amount of waste and their hazardous characteristics;
- treated waste;
- planning and control of activities and processes of waste management;
- transport waste;
- in the setting up, operation, closure and maintenance of waste treatment plants;
- monitoring;
- with aspect and education related activities and activities on waste management.

This system is based on the selection and application of efficient technologies that enable the achievement of the highest goals in the field of waste management, with the appropriate construction of legal regulations. The basic prerequisite for the successful implementation and functioning of the integrated waste management system is the proper hierarchical application of all these activities (Figure 1).

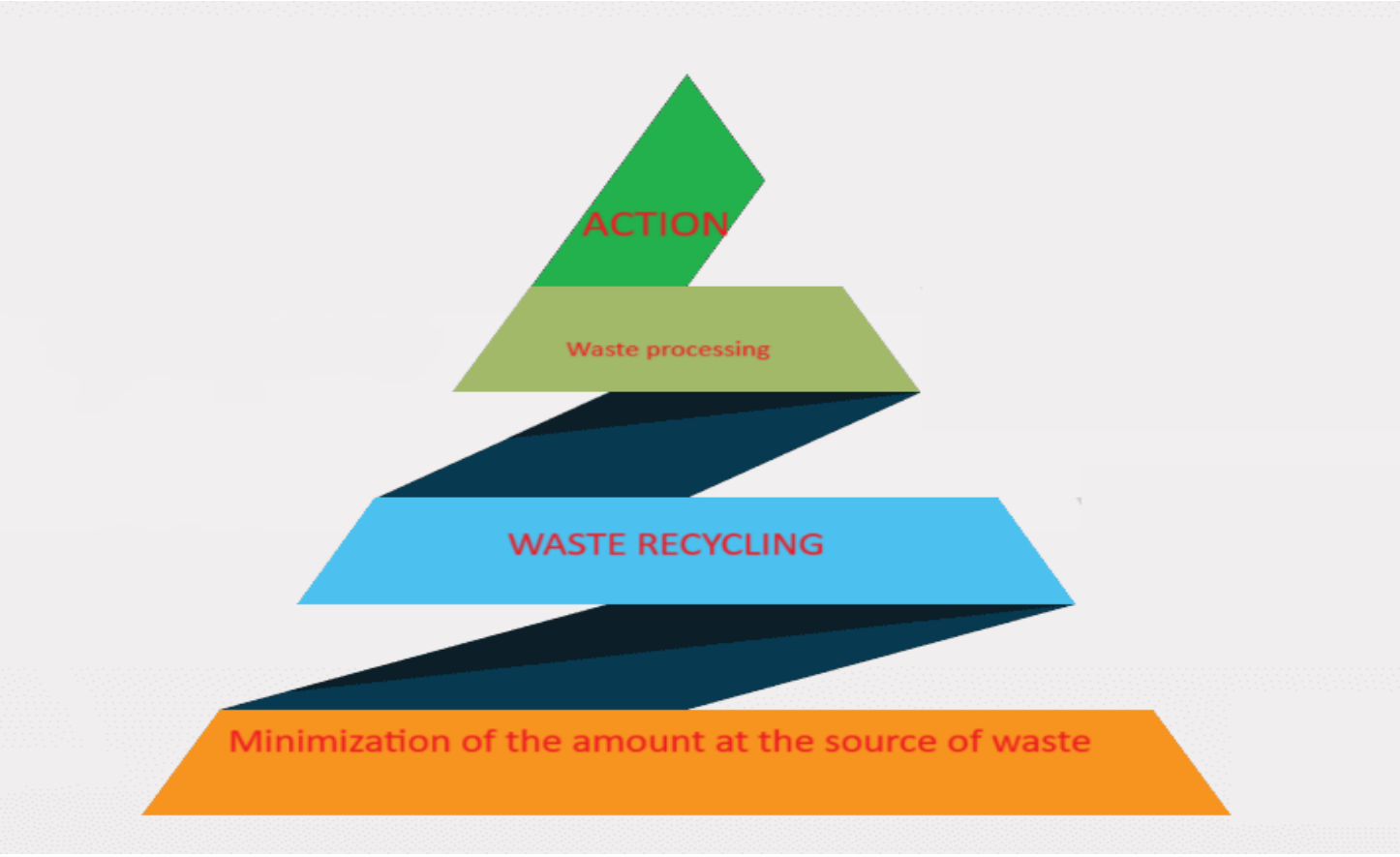


Figure 1. Integrated waste management system
(http://www.sepa.gov.rs/index.php?menu=207&id=202&akcija=showXlinked)

The waste collection system implemented in Montenegro consists primarily of collection and disposal of mixed waste at the existing landfills in Podgorica and Ulcinj, as well as at controlled and uncontrolled landfills, distributed throughout the country. In some municipalities (e.g. Podgorica) separate ones are conducted activities of collection and return of recycling waste, green and bulky waste, but the results of the system are poor. In the Republic

of Montenegro the waste collection service covers more than 87% of the population, while more than 90% of waste is being collected i.e. 1.3kg per inhabitant per day. In accordance with the relevant documentation municipalities have the right to manage and organize waste collection on their territory and are responsible to organize the entire waste collection and disposal process, including the collection of the cover charge of all costs. This is usually done through public utility companies (JKP), whose founders are local self-government.

The Law on Waste Management (Official Gazette No. 64/11 and 39/16) defines that paper, metal, plastic, glass and bio-waste they must be collected and recycled separately. Nevertheless, the current situation is not on this level either due to lack of information and education, either due to not existing infrastructure, and above all, financing.

Regarding infrastructure for recycling and waste processing, some municipalities (Podgorica, Herceg Novi, Kotor, Budva and Mojkovac) have recycling yards that are owned by JPK and where their employees work companies. Citizens can leave certain types of secondary raw materials, but without compensation, which is considered demotivating factor. In order to support the transition of Montenegro towards a more resource-efficient and circular economy, it must be ensured that every waste generated is treated efficiently and effectively, in order to reduce its impact on life environment, while at the same time maximizing its potential as a resource.

2. INSTITUTIONAL FRAMEWORK FOR WASTE MANAGEMENT AT THE LEVEL OF THE EUROPEAN UNION, THE REPUBLIC OF SERBIA AND THE REPUBLIC OF MONTENEGRO

The implementation of environmental policies, especially the ones regarding waste, is one of the key priorities of the European Union - Commission (EC), which was confirmed by its proposal for the 7th Environmental Action Program (EC, 2012) and for Roadmap to a resource-efficient Europe (EC, 2011). The legislative framework for solid waste management (SWM) was first introduced in 1975 and has been the subject of several amended in 1991, 2006 and 2008 with the introduction of the "New Framework Directive on Waste". EU Framework Directive on waste (EU, 2008) and the Landfill Directive (EU, 1999) set binding targets for recycling municipal waste and diversion of biodegradable municipal waste from landfills. The period between 2015-2020 was a turning point for the European Union in the field of waste management, as it was passed the decision to move from the existing linear model to a circular economy, in which products are designed in such a way as to reduce the final waste to a minimum, so that they can be easily and efficiently reused or recycled, whereby resources would be preserved through the full exploitation of their surplus value. Today, the goal is to turn waste management into sustainable materials management in order to provide protection and improvement of the environment and public health, reasonable use of resources, transition to self-sustainability development model and creation of new sustainable economic opportunities and jobs. At the same time, the transition to circulareconomy will consist of one of the main pillars for achieving climate neutrality by 2050, mainly through decoupling economic growth from resource use.

2.1. Legal regulations and National Waste Management Strategy in the Republic of Serbia

The environmental field in the Republic of Serbia is facing numerous and rapid changes. Therefore, local self-governments are forced to adapt to the imposed legislation that is in line with European legislation. The waste management policy in the Republic of Serbia is regulated through two basic laws and a national strategy, namely:

- Law on waste management (Official Gazette of RS No. 36/09, 88/10, 14/16, 95/18).
- Law of packaging waste (Official Gazette of RS no. 36/09, 95/18).
- National strategy for waste management in the territory of the Republic of Serbia.

The Law on Waste Management (Official Gazette of the Republic of Serbia No. 36/09, 88/10, 14/16, 95/18) regulates the type and classification of waste, waste management planning, entities, responsibilities and obligations of waste management, special waste management flows, conditions and permitting procedures, cross-border movement of waste, reporting and financing of waste management, supervision and other issues of importance for waste management.

Waste management is an activity of general interest that involves the implementation of a whole range of prescribed measures for waste handling within the collection, transport, storage, treatment and disposal of waste, including the supervision of these activities and the care of waste management facilities after their closure.

Within the framework of this Law, the following bylaws are adopted:

- Regulation on lists of waste for cross-border movement, content and layout of documents accompanying cross-border waste recycling with instructions for their completion ("Official Gazette of the Republic of Serbia", No. 60/09).
- Regulation on the determination of certain types of hazardous waste that can be imported as secondary raw materials ("Official Gazette of Rs", no. 60/09).
- Regulation on the form of the Document on the Movement of Waste and the Instruction for its Completion ("Official Gazette of Rs", no. 72/09);
- Regulation on the form of the Document on movement of hazardous waste and instructions for its completion ("Official Gazette of RS", No. 72/09).
- Regulation on the application form for issuance of a permit for storage, treatment and disposal of waste ("Official Gazette of RS", No. 72/09).
- Regulation on products that become special waste streams after use, daily record form on quantity and type of produced and imported products and annual report, manner and deadlines for submitting annual report, payers of compensation, criteria for calculation, amount and method of calculating and payment of fees ("Official Gazette of RS" No. 54/10).

- Regulation on the content and appearance of the permit for storage, treatment and disposal of waste ("Official Gazette of RS" No. 96/09).
- Rulebook on the manner and procedure for managing waste tires ("Official Gazette of RS" No. 104/09).
- Regulation amending regulations on the manner and procedure for waste tyre management ("Official Gazette of Rs" No. 104/09 and 81/10).
- Rulebook on categories, testing and classification of waste ("Official Gazette of RS" No. 56/10).
- Rulebook on methodology for collecting data on the composition and quantities of municipal waste in the territory of local self-government units ("Official Gazette of Rs" No. 61/10).
- Rulebook on conditions, manner and procedure for waste oil management ("Official Gazette of RS" No. 71/10).
- Regulation on the content of the certificate on exemption from the obligation to obtain a permit for the storage of inert and non-hazardous waste ("Official Gazette of Rs" No 73/10).
- Rulebook on the treatment of waste containing asbestos ("Official Gazette of RS" No. 75/10).
- Regulation on medical waste management ("Official Gazette of RS" No. 78/10).
- Regulation on the manner and procedure of management of spent batteries and accumulators ("Official Gazette of RS" No. 86/10).
- Rulebook on the methodology for the preparation of the national and local register of pollution sources, as well as the methodology for the types, methods and deadlines of data collection ("Official Gazette of the Republic of Serbia" No. 91/10).
- Decree on landfill disposal of waste ("Official Gazette of RS" No. 92/10).
- Regulation on termination of validity of the Rulebook on criteria for determining the location and regulation of waste materials landfills ("Official Gazette of Rs" No. 92/10).
- Regulation on the method of storage, packaging and labelling of hazardous waste ("Official Gazette of the Republic of Serbia" No. 92/10).
- Rulebook on content, management method and appearance of the Registry of issued permits for waste management ("Official Gazette of RS" No. 95/10).
- Regulation on the form of daily records and annual report on waste with instructions for its completion ("Official Gazette of RS" No. 95/10).
- Rulebook on the manner and procedure for managing waste fluorescent tubes containing mercury ("Official Gazette of RS" No. 97/10).

- Regulation on conditions and manner of collection, transport, storage and treatment of waste used as a secondary raw material or for obtaining energy ("Official Gazette of the Republic of Serbia" No. 98/10).
- Rulebook on the manner and procedure of managing end-of-life vehicles ("Official Gazette of RS" No. 98/10).
- Regulation on the list of industrial installations and activities controlling the emission of volatile organic compounds, on the values of emission of volatile organic compounds at certain solvent consumption and total permitted emissions, as well as the scheme for reducing emissions ("Official Gazette of the Republic of Serbia", No. 100/2011).
- Regulation on technical measures and requirements relating to permitted emission factors for correctable organic compounds originating from the process of storage and transport of gas ("Official Gazette of the Republic of Serbia", No. 1/2012, 25/2012, 48/2012).
- Rulebook on document on movement of waste ("Official Gazette of RS", no. 114/13).
- Regulation on the methodology for the preparation of the national and local register of pollutant sources, as well as the methodology for the types, methods and deadlines of data collection ("Official Gazette of the Republic of Serbia", No. 91/2010, 10/2013 and 98/2016).
- Regulation on the form of the Document on the movement of hazardous waste, the prior notification form, the method of its submission and the instructions for their completion ("Official Gazette of the Republic of Serbia", No. 17/17).
- Rulebook on the manner of keeping and appearance of landfill and garbage dump records in the area of the local self-government unit ("Official Gazette of Rs", no. 18/18).
- Regulation amending the Regulation on products that become special waste streams after use, the form of daily records on the quantity and type of produced and imported products and the annual report, the manner and deadlines for submitting the annual report, payers of compensation, criteria for calculating, the amount and method of calculating and paying fee ("Official Gazette of the Republic of Serbia", No. 77/2021)
- Regulation amending the Regulation on the daily record form and the annual report on waste with instructions for filling it out ("Official Gazette of the Republic of Serbia", No. 79/2021).
- Ordinance on the content and appearance of the application form for the type and quantity of mineral fertilizers, i.e., plant protection products, i.e., detergents with phosphates ("Official Gazette of the Republic of Serbia", No. 14/2020 and 79/2021).

The Law on Packaging and Packaging Waste (Official Gazette of RS, No. 36/09 and 95/18) regulates the conditions of environmental protection that packaging must meet for placing on the market, packaging management

and packaging waste, packaging and packaging waste reporting, economic instruments and other issues related to packaging waste. This Law applies to imported packaging, packaging that is produced or placed on the market and all packaging waste generated by economic activities in the territory of Serbian audience regardless of the origin, use and use of packaging material. Within the framework of this Law, the following bylaws have been adopted:

- Regulation on the establishment of the Packaging Waste Reduction Plan for the period from 2010 to 2014 ("Official Gazette of the Republic of Serbia", No. 88/09).
- Regulation on the criteria for calculating the fee for packaging or packaged product and exemption from payment of the fee, payers of payment, the amount of the fee, as well as on the method of calculating and paying the fee (Official Gazette of the Republic of Serbia", No. 8/10).
- Regulation on packaging types with a long service life ("Official Gazette of RS", No. 70/09).
- Rulebook on criteria for determining what packaging can be, with examples for applying criteria and list of Serbian standards relating to the basic requirements that packaging must meet for placing on the market ("Official Gazette of the Republic of Serbia", No. 70/09).
- Regulation on the annual amount of packaging waste by types for which space for collection, collection, sorting and temporary storage is provided ("Official Gazette of the Republic of Serbia", No. 70/09).
- Regulation on the manner of numbering, abbreviations and symbols on which the system of identification and marking of packaging materials is based ("Official Gazette of the Republic of Serbia", No. 70/09).
- Regulation on the type and annual quantity of packaging used for packaged goods placed on the market for which the manufacturer, importer, packer/filler and supplier is not obliged to ensure the management of packaging waste ("Official Gazette of the Republic of Serbia", No. 70/09).
- Regulation on the limit value of the total concentration level of lead, cadmium, mercury and hexavalent chromium in packaging or its components, exemptions from application and the time limit ("Official Gazette of the Republic of Serbia", No. 70/09).
- Regulation on the content and manner of keeping the Register of issued permits for packaging waste management ("Official Gazette of Rs", No. 76/09).
- Regulation on forms of reports on packaging and packaging waste management ("Official Gazette of the Republic of Serbia", No 21/10).
- Regulation on forms of reports on packaging and packaging waste management ("Official Gazette of RS", No. 21/2010).
- Regulation amending Regulation on the forms of reports on packaging and packaging waste management ("Official Gazette of the Republic of Serbia", No. 10/2013).

The National Waste Management Strategy with the EU Approximation Policy was adopted on 4 June 2003 by the Government of the Republic of Serbia. It is a basic document on the basis of which conditions for rational and sustainable waste management at the level of the Republic are ensured. The strategy determines:

- In accordance with economic development;
- In accordance with the requirements and plans of the European Union;
- Hierarchy of possible options;
- Activity in the process of harmonization in accordance with the legislation of the European Union;
- On the responsibility;
- Goals;
- Quests.

The implementation of the strategy achieves a large number of goals that are important for all levels of government - from local self-government to the republican level. As the most important thing it is necessary to single out:

- Protecting and improving the environment;
- For the protection of human health;
- To meet the principles of sustainable waste management;
- Change of attitude on environmental protection and waste as one of its segments;
- Increase the level of public awareness.

The process of approaching the European Union and harmonization of domestic and European legislation in the field of waste included the basic principles used in the process of improving the waste management system in our country:

- With a smaller amount of waste generated;
- Prevenance of waste formation;
- Solving the problem of waste at the point of origin;
- Principe of waste separation;
- Principe recycling as much waste as possible;
- Principe for the most rational use of existing waste treatment systems;
- Principe of rational construction of treatment plants;
- Principe of monitoring pollution in order to preserve the quality of the environment.

The application of the basic principles of waste management defined in this strategic framework implements the basic EU principles in the field of waste and prevents further danger to the environment and generations to come.

In order to overcome the problems that have arisen in the National Strategy, a solution has been formed that includes the formation of a network of 5 infrastructure facilities in Serbia for the purpose of efficient waste management, which are shown in Table 1.

Table 1. Infrastructure solutions regarding the most efficient waste management in the territory of the Republic of Serbia that are included in the national waste management strategy

Types of objects	**Number of objects**
Regional sanitary landfills	29
Transfer stations	44
Recycling centers	17
Compression centers	7
Municipal waste incinerators	4

Source: (http://www.sepa.gov.rs/index.php?menu=207&id=202&akcija=showXlinked)

In order for the public to be better acquainted with the importance of these objects and not to mix concepts, it is necessary to give brief definitions of the above objects.

Landfills are defined as sites for the final disposal of waste located above or below the surface of the earth, or places for internal disposal of waste formed by enterprises within their plant where waste and originated, permanent places (more than one year) where the waste is temporarily stored except for the transfer of stations and storage of waste before treatment or after its re-use (period less than three years).

A transfer station is defined as site to which waste is delivered for temporary storage due to separation or transshipment for transport to another place where it is disposed of, stored and treated. The main reason for using transfer stations is to reduce the cost of transporting waste to the plant for treatment/delay. By consolidating smaller cargo from collection vehicles to larger transport vehicles, costs less time is spent on travel to remote landfills and more time for collection of waste. Choice of direct transport or through a transfer station depends on factors such as the distance to the landfill and the amount of solid waste.

A recycling center is a place where the reprocessing of waste materials is carried out in the production process for reuse, other use and organic recycling, except for energy purposes.

The Composting Center is a place where solid waste is treated under the action of a microorganism for the purpose of creating compost in the presence of oxygen and under controlled conditions.

Municipal waste incinerator is the site where waste incineration is carried out, that is, controlled thermal treatment of waste with or without the utilization of energy produced in mobile or stationary plant. This type of treatment includes pyrolysis, gasification and plasma combustion.

2.2. Legal regulations and National Waste Management Strategy in the in the Republic of Montenegro

Policy in waste management in Montenegro was defined in 2004 with the adoption of the document National Policy for integrated and sustainable waste management. In this document, it is specified that its purpose is to "propose goals and strategies for reducing, controlling and managing waste and its pollution, which is essential importance for the sustainable, ecological and economic development of the Republic of Montenegro". Since then, important steps have been taken in the area of waste management policy and regulation. The legal framework in Montenegro is currently governed by the Law on Waste Management (Official Gazette No. 64/11 and 39/16), which aims to transpose EU legislation on waste, although there have been shortcomings in its implementation. According to the Law (Article 3), waste refers to "any matter or object that the owner has discarded, intends to discards or is obliged to discard in accordance with the law;". The types of waste are:

- Municipal waste – waste generated in households (domestic waste), as well as waste generated performing certain activities and which, by its nature and composition, is similar to household waste;
- Commercial waste – waste generated in business entities, institutions and others organizations, which are fully or partially engaged in trade, service activities, office work, sports, recreation or entertainment, not including household waste and industrial waste.
- Industrial waste – waste generated in any industrial facility, as well as in locations where are located, and which differs in its composition and characteristics from municipal waste.

The proposal of the Law on Waste Management, version 8/2022" which is in the procedure for adoption aims to further harmonize the Montenegrin legislation waste legislation with EU legislation, more precisely with the EU Circular Economy Directive 2018/851 about waste. In this regard, it aims to promote sustainable development through more efficient use of resources and waste reduction. Currently, the targets do not match the performance of waste management. Therefore, "the proposal of the Law on Waste Management,

- version 8/2022" provides principles for establishing a system of extended producer responsibility (including
- Organizations for producer responsibility), as well as producer requirements (Articles 14-17). Quantitative targets are introduced
- for waste from electrical and electronic equipment (WEEE) (Art. 54) for the collection of 45% and 65% of the average annual
- masses of electrical and electronic equipment placed on the market in the last three years (until 2024 and 2027).

- Quantitative targets for the flows of waste vehicles, waste tires, waste batteries and accumulators are also determined.

LEGISLATION in Montenegro is as follows:

- Law on Waste Management ("Official Gazette of Montenegro", no. 64/11 and 39/16);
- Law of the Law on Nature Protection ("Official Gazette of Montenegro", no. 54/16 and 18/19);
- Law on Spatial Planning and Building Construction ("Official Gazette of Montenegro", no. 064/17, 044/18, 063/18, 011/19);
- Law on Local Self-Government ("Official Gazette of Montenegro", no. 2/18 and 34/19);
- Law on Local Self-Government Financing ("Official Gazette of Montenegro", No. 3/19);
- Law on Environmental Impact Assessment ("Official Gazette of Montenegro", No. 75/18);
- Law on State Administration ("Official Gazette of Montenegro", No. 78/18);
- Law on Administrative Procedure ("Official Gazette of Montenegro", no. 56/14, 20/15, 40/16, 37/17);
- Law on Public Procurement ("Official Gazette of Montenegro", no. 46/06, 42/11, 057/14, 028/15, 042/17);
- Law on the Environment ("Official Gazette of Montenegro", No. 52/16);
- Law on Integrated Prevention and Control of Environmental Pollution ("Official Gazette of Montenegro", no. 80/05, 54/09, 40/11, 42/15 and 54/16);
- Law on Strategic Environmental Impact Assessment ("Official Gazette of Montenegro", No. 80/05, 73/10, 40/11, 59/11 and 52/16);
- Law on Inspection Supervision ("Official Gazette of Montenegro", no. 39/03, 76/09, 57/11, 18/14, 11/15,
- 52/16);
- Law on communal activities ("Official Gazette of Montenegro", no. 55/16).

Furthermore, Montenegro is a signatory to the Basel Convention and the Ban Amendment of 10/2006, and in connection with cross-border movement of hazardous waste.

- Law on ratification of the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their postponement ("Official Gazette of the FRY - International Agreements", No. 2/99).

2.3. EU waste management legislation

Waste management in the EU is governed by a whole range of decisions, regulations and directives:

- Directive 2000/53/EC ep and es on end-of life vehicles. This Directive lays down measures aimed primarily at preventing vehicle waste and, in addition, re-use, recycling and other forms of recovery of end-of life vehicles and their components with a view to reducing waste disposal, as well as improving the environmental impact of all economic operators dealing with vehicles during the life cycle of vehicles, in particular entities directly involved in the treatment of end-of life vehicles.
- Directive (EU) 2018/851/EP and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste, which aims to ensure that the products laid down in Directive 2008/98/EC of the European Parliament and of the Council (4) for preparing for re-use and recycling of waste should be tightened to better reflect the Union's efforts to move towards a circular economy.

- Council Directive 2008/98/EC on waste replacing and supplementing Framework Directive 75/442/EEC, 2006/12/EC establishes a system for coordinated waste management in the EU with the aim of limiting waste production.
- Council Directive 99/31/EC on landfills aims to reduce the negative effects of waste disposal on the environment, in particular on soil, groundwater and surface water, as well as the effects on the health of the population by introducing strict technical requirements.
- Council Decision establishing criteria and procedures for the acceptance of waste at landfills in accordance with Directive 99/31/EC
- Council Directive 2000/76/EC on the incineration of waste - The aim of the Directive is to set standards for the reduction of air, water and soil pollution caused by incineration or co-insinuation of waste, in order to prevent risks to human health.
- Council Directive 2006/66/EC replacing and supplementing Directive 91/157/EEC on batteries and accumulators containing hazardous substances introduces measures to dispose of and control the disposal of spent batteries and accumulators containing hazardous substances with a view to reducing pollution by heavy metals used in the manufacture of batteries and accumulators.
- Council Directive 75/439/EEC on the disposal of waste oils supplemented by Directives 1987/101/EEC, 91/692/EEC, 2000/76/EC promotes the collection and disposal of mineral lubricants or industrial waste oils that can no longer be used for original use.
- Council Directive 91/689/EEC on hazardous waste supplemented by Directives 94/31/EC and 166/2006/EC aims to establish the management, utilization and proper disposal of hazardous waste.
- Council Directive 96/59/EC on the disposal of PCB and PCT aims to define a controlled manner of handling and eliminating polychlorinated biphenyls (PCTs) and polychlorinated terphenyls (PCTs) and the

decontamination of the equipment in which they were located, as well as the disposal of equipment contaminated with the PCB and not decontaminated thereof.

- Council Directive 2000/53/EC on spent vehicles establishes measures to prevent the generation of waste from worn-out vehicles by stimulating the collection, reuse and recycling of their components (batteries, tires, accumulators, oils) in order to protect the environment.
- Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment and Directive 2002/96/EC on waste electrical and electronic equipment aims to limit the use of certain hazardous substances in electrical and electronic equipment, i.e., to promote the reuse, recycling and utilization of electrical and electronic equipment with a view to reducing the amount of waste.
- Directive 86/278/EEC on the protection of the environment and, in particular, land in the case of the use of secondary fertilizers in agriculture defines the use of sludge from wastewater treatment plants in agriculture for the prevention of pollution of soil, vegetation, people and animals.
- Directive 78/176/EEc on waste from the industry using titanium dioxide, supplemented by Directives 82/883/EEc (further supplemented by Regulation 807/2003/EC), 83/29/EES and 91/692/EES (further supplemented by Regulation 1882/2003/EC) concerns the prevention and progressive reduction until removal, of pollution caused by waste from the titanium dioxide industry.
- Council Directive 94/62/EC on packaging and packaging waste supplemented by Directives 2005/20/EC, 2004/12/EC, 1882/2003/EC implements an EU packaging waste strategy and aims to harmonize national measures for the management of packaging waste, to minimize the environmental impact of packaging waste and to avoid trade barriers in the EU that can prevent competition.
- Regulation (EC) No 1774/2002 on waste of animal origin lays down technological processes for the processing of waste of animal origin.
- Regulation (EC) No 1013/2006 on cross-border movements of waste regulates the control and control of cross-border movements of waste.
- Commission Decision 2001/524/EC on published references of standards EN 13428:2000, EN 13429:2000, EN 13430:2000, EN 13431:2000 and EN 13432:2000 in the Official Journal of the European Community concerning Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste.
- Commission Decision 2001/171/EC on the conditions for reducing the concentration of heavy metals in glass packaging laid down in Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste

- Commission Decision 2005/270/EC establishing forms relating to the databases referred to in Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste
- Commission Decision 1999/177/EC on the conditions for the reduction of the concentration of heavy metals in plastic rates and pallets laid down in Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste

II. SPECIAL PART

3. ENVIRONMENTAL SITUATION IN THE REPUBLIC OF SERBIA AND REPUBLIC OF MONTENEGRO WITH SPECIAL REFERENCE TO THE FIELD OF POLIMLJE

The period between 2015-2020 was a turning point for the European Union in the field of waste management, as it was passed the decision to move from the existing linear model to a circular economy, in which products are designed in such a way as to reduce the final waste to a minimum, so that they can be easily and efficiently reused or recycled, whereby resources would be preserved through the full exploitation of their surplus value. Today, the goal is to turn waste management into sustainable materials management in order to provide protection and improvement of the environment and public health, reasonable use of resources, transition to self-sustainability development model and creation of new sustainable economic opportunities and jobs. At the same time, the transition to circular economy will consist of one of the main pillars for achieving climate neutrality by 2050, mainly through decoupling economic growth from resource use. Amended directives increase the level of ambition for the recycling of municipal and packaging waste, while municipal waste landfills should be further reduced. Food waste should be halved to 2030, while hazardous waste, biological waste and textiles from households will have to be collected separately.Moreover, the new rules envisage greater use of effective economic instruments, such as extended producer responsibility schemes

3.1. Initial state of the country and environmental information

The Republic of Serbia covers an area of 88,000 people.499 square kilometers, which makes up only 0.05% of the world's land area and 1.5% of the territory of Europe. Despite the small area, the environment in Serbia is very diverse compared to other European countries. The reasons for this corporative wealth lie in the diversity of climatic, topographical, geological and long-term ecological and evolutionary historical characteristics of the region as a biological crossroads.

The Republic of Serbia has about 7 million inhabitants, of which 50% live in rural areas, 17% of them live from agriculture and related industries. The Republic of Serbia has three forms of relief, namely:

- Plain relief in the area of Vojvodina and floodplains of the Danube River, Sava, Drina;
- dolina river Morava in its main course and two southern tributaries;

- Mountain areas that cover most of the land south of the Sava and Danube.

In addition to precipitation, water resources in the RS have an influx from upstream flows in the basin, which according to the estimate brings 85% of the available water. The balance is achieved on the basis of the Morava River in the interior of the country. Due to seasonal variations, there are about 160 accumulation dams, some of which have the capacity of hydroelectric power plants.

The Republic of Serbia is very rich in waters that represent its great natural wealth, has a dense network of rivers, numerous lakes and a large number of thermal and mineral water springs . Based on numerous follow-ups , data were obtained on the presence of ammonia, nitrates, sulfides, iron and mineral oils in the Tisa River basin , volatile phenol and manganese in the wells in the area of Bačka. In some cases, for example, in the South Morava basin there is a solubility of solids. On the territory of the RS, the most common problems are physical and chemical characteristics of water, turbidity, bacteriological correctness and water pollution with waste as a result of the absence of sanitary landfills.

This study will focus on the Drina River basin, i.e., the Lim River, which will be discussed a little more below.

3.2. Basic information about the Drina River Basin

The Drina River is about 346 km long and is the largest tributary to the Sava River Basin. The Drina River Basin makes up 1/5 of the Sava River Basin. As much as 1/3 of the water in the Sava River comes from the Drina. The Drina River basin covers an area of 19,680 square kilometers. It is spread over the territory of four states. It covers the northern half of Montenegro (31.6%), BiH (37.1%), Serbia (30.5%), while less than 1% of the basin belongs to Albania. The Drina is formed between the slopes of the Maglić and Pivska mountains between the villages of Šćepan Polje (Montenegro) and Hum (BiH). The lowest point of the Drina river basin is at 82 m above sea level at the Drina flow into the Sava River near the village of Crna Bara. The main tributaries of the Drina River in Serbia are the Lim River with the Rivers Uvac, Rzav, Ljubovida and Jadara.

The very high flow of water that this river has (12 billion cubic meters per year) and good water quality, ranks it very high on the list of areas with a great wealth of natural resources opportunities and opportunities for development in the region. This has a very large potential for the production of electricity in hydropower plants (about 60% of the potential is untapped), as well as very large opportunities for the development of tourism due to its many tourist attractions , it gives it a special charm. Mining, Tourism, Industry and Agriculture are the main activities that are developing here. There are about 1.000,000 inhabitants in this territory.

3.2.1. River Lim

The river Lim is formed at an altitude of 999 m by highlighting from Lake Plav. Lim is a Balkan river that runs through four countries Montenegro, Albania, Serbia, Republika Srpska (Bosnia and Herzegovina), i.e., the towns of Andrijevica, Berane, Bijelo Polje, Prijepolje, Priboj, Rudo, and at the foot of Medveđa at 299 m above sea level, its journey ends as a tributary of the Drina between Gorazde and Višegrad (Figure 2).



Figure 2. River Lim - cities through which it flows (https://en.wikipedia.org/wiki/Lim_%28river%29#/media/File:%D0%9F%D0%BE%D0%BB%D0%B8%D0%BC%D1%99%D0%B5.JPG)

The sheet metal is formed in the Plav-Gusinj valley and flows from it to the northwest in the Gorge of Sutjeska, after which it exits into the Berane Valley. The river then crosses into the Tivran gorge from which the Bjelo Polje valley opens, after which begins Dubrakovačka gorge, which eventually passes into a real canyon 11 km long with a height of sides up to 550m. It is also known as the Kumanica Gorge, and today it houses the state border between Serbia and Montenegro. After the Kumanica gorge, the river enters the Brodarevska valley, after which the river banks narrow again, only to open again to Prijepolje field where it is joined by the river Mileševka. After Prijepolje, a new gorge begins, which with smaller valley extensions lasts to the mouth of the river Uvac. The water of the river Lim belongs to the I or II category, while the river Uvac enters the I category in terms of water quality. Most of the water of the Lim River is of allogenic origin and there is not a single major tributary on the territory of the Municipality of Priboj. The tributaries of Lima in this area have a predominantly bujijic character. In addition to the Uvac, the smaller right tributaries of the Lima are the Kratovska River, the Mijailovac stream, the Jarmovac stream and the Godni stream. The left tributary of Lim is Poblaćanica with Ljutina (Ljutina originates from Babotina and Sutjeska). Floods in the Lima Valley have been significantly reduced by the construction of the artificial reservoir Potpećko lake with a volume of 44,000,000 m³ on which there are two hydropower plants, Potpeć (54MW) and Bistrica (104 MW), one of which uses the lake as a reservoir and the other as compensatory swimming pool (Fig. 3).



Photo 3. Potpećko lake (Local waste management action plan of the municipality of Priboj, 2011)

According to measurements carried out in Berane, the lowest water flow was recorded on August 20, 1954 and amounted to only 8.16 m^3/s, while the highest of 864 m^3/s was recorded on November 10, 1965.

The Lim River forms a composite valley in which gorges and valleys alternate, and the fertile area around it is called Polimlje. The Lim River is characterized by green, light green clean water, composite complex of the valley, rich fish, artificial lake, the possibility of rafting and kayaking, cultural and historical monuments. Thanks to its wild waters , this river has become an exempt place for rafting (Figure 4).



Figure 4. Lim River (avanturista.co/blog/reka-lim/).

However, today, as one of the biggest and most pressing problems in the Polimlje area, waste is emerging, so that the Lim River has become one of the cleanest rivers in Europe to the largest floating landfill. It is precisely the problem of waste in this river and the way it is cleaned and the topic of this study.

3.3. The main environmental pressures in the Drina River Basin (Polim region)

Environmental pollution in the Drina river basin, and especially in the Lim river coast, can occur due to various reasons:

- Human activities (agriculture and industry);
- And historical human activities (polluted sites);
- New construction (Future infrastructure projects).

The dotted sources of pollution are: settlements, industry and agriculture.

There are several types of pollution that should be mentioned:

Organic pollution

Organic pollution can cause significant changes in the oxygen balance of the water surface. In addition, it can affect the composition, species and population of the aquatic world, which significantly affects the status of waters. Organic pollution is primarily due to partially processed or unprocessed wastewater from collectors, industry and agriculture. Many collectors in the Drina River Basin , especially Lima, have either partial or no wastewater treatment, and therefore represent the main sources of pollution. For example , the municipality of Bijelo Polje in Montenegro has an industrial zone that discharges its wastewater directly into Lim. This leads to the fact that the

river Lim, in addition to classical waste, is polluted by other hazardous substances. Direct and indirect wastewater outbursts are also important. Waste water is often either not processed at all or partially processed before discharge into surface water (direct emission) or in public waters. sewage systems (indirect emission).

Nutrient pollution

Contaminated with nutrients, especially nitrogen (N) and phosphorus (P) can cause eutrophication of surface waters. Nutrient pollution is the first challenge for fresh water. As already stated, the Drina represents the largest tributary of the Sava River, while the Sava is the third longest tributary of the Danube and brings the largest amounts to the Danube. When it comes to nutrients Sava pours about 1.79-6.89 kt/a total P and 37.86-85.58 total N_2 into the Danube.

Contamination with hazardous substances

Hazardous substances include artificial chemicals, metals formed in nature, petroleum and its derivatives, substances that interfere with endocrine functions, personal hygiene products and pharmaceutical preparations. Hazardous substances themselves are a consequence of industrial activities that can be various: electricity generation (hydropower plants), mining (lead, zinc, copper, etc.), mechanical engineering, metallurgy, chemical industry, glass production, leather, pharmaceutical industry, pesticides used in agriculture, dairy industry, paper industry and cardboard.

Hydro morphological changes

Hydro morphological changes are the consequences of pressure related to the extraction, closure of water and modification of water regimes. They have significance exclusively at the local level and have no consequences on the entire level of cross-border nature. However, the cumulative effect of water extraction can affect the cross-border context. The key driving forces that lead to a change in the driving force of the Sava and Drina rivers are primarily hydroelectric power plants (78%), water supply (10%) and flood protection (6%). The interruptions of the continuity of water flows along the length are: dams, constitutions, ramps and sleepers. On the tributaries of the Sava River (Drina, Uvac, Lim and Rzav) there are barriers, there are a total of 6 of them (Figure 5).



Figure 5. Overview of habitat continuity interruptions along the length in the Sava and Drina river basins (Programme for Integrated Development of the Sava and Drina Corridors - SDIP, Framework for Environmental and Social Management for Serbia – ESMF, Belgrade, 2019).

Future infrastructure projects

In addition to the already existing degradation of the Drina River and its tributaries as a result of hydro morphological changes, the continuity of rivers in Serbia is also influenced by future infrastructure projects. These projects can affect water status. For example, the construction of two hydropower plants on the river Lim Brodarevo 1 and 2 can significantly aggravate the situation.

Climate change and flooding

According to the World Meteorological Organization, global climate change will affect Serbia and Southern Europe on a medium level. This means that Serbia will increasingly have warm summers, with a little drought and a lot of droughts. In Serbia, the temperature has increased by 1°C over the past 100 years, which will continue. Global changes in the climate are leading to more moisture in the atmosphere. This causes the storms to get wetter and slower, so the most precipitation is just occurring in river basins. Flooding is caused and amplified by meteorological and human factors. The key meteorological factors are heavy and prolonged rainfall, thunderstorms and melting snow, while human factors that most affect floods can be highlighted changes in outflows and poor maintenance of hydraulic and flood protection infrastructure. The Drina River and its tributaries have a very high potential for devastating flooding. The Lim River often flows out of its bed and causes problems both in Priboj, Prijepolje and neighboring Montenegro. Heavy floods that have hit Serbia since 2010 have caused great damage to infrastructure facilities, agricultural land. These floods themselves are not only the result of rains, but also of human negligence,

which is reflected in the deafening of drainage canals precisely by people throwing various waste into them, which leads to congestion and large spills.

Waste

The general state of waste in the Republic of Serbia is still inadequate and poses a risk to public health and the environment. The most dangerous problem at the moment is hazardous waste that is not treated and not treated separately, but is disposed of in ordinary landfills. In general, over 50% of landfills in the Republic of Serbia do not meet the basic technical requirements to be sanitary landfills. In fact, these are just fenced and mapped garbage dumps. There are also hundreds of illegal landfills of various sizes in rural areas. Also, outflows from these landfills pose a very high danger to surface water, groundwater and soil due to the very high presence of organic matter. Unprocessed industrial and wastewater continues to be a source of pollution. The polluter's response remains inadequate. The Law on Waste Management , which is explained in detail in the first part, as well as its bylaws, significantly contribute to compliance with European standards in this area. However, the penal policy is inadequate, so many companies and individuals turn a deaf ear to it.

According to the Environmental Protection Agency (SEPA) report on waste management in the period 2011-2017. In 2015, 2.15 metric tons of waste were generated, of which 1.80 tons were metric tons, while 87.3 tons were collected by utilities. The median daily amount of municipal waste that ends up in city landfills per capita is 0.64 kg, while the annual value is 0.30 metric tons. This does not include 20% of municipal waste generated that ends up in illegal landfills. In the waste management sector, certainly the most visible and complex problem is municipal waste management, where Serbia lags significantly behind the countries of Western and Eastern Europe in all the stages of this process from collection to removal of waste. There's nothing to say about recycling, because it doesn't exist. Statistics that are devastating in terms of recycling are that only 3% of municipal waste is recycled, while other waste is disposed of in landfills.

4. ANALYSIS OF THE STATE OF WASTE MANAGEMENT IN THE FIELD OF POLIMLJE - MUNICIPALITY OF PRIBOJ AND MUNICIPALITY OF BIJELO POLJE

The current waste management system includes basic information about participants in the collection and transport of waste, the quantity and composition of waste, the technical equipment used to remove waste., reuse and recycling of waste, conditions on existing garbage dumps, impacts of garbage dumps on the environment and human health and economic aspects. In relation to these data , the existing situation is analyzed and problems are identified on the basis of which the goals and strategic steps for solving key problems are defined and establishing a sustainable waste management system.

In this chapter, the state of waste management in the territory of Polimlje will be analyzed. This is very important because it is precisely this waste that ends up in the Lim River, which makes a landfill out of it. Emphasis will be placed on two municipalities, Priboj in Serbia and Bijelo Polje in Montenegro.

4.1 . General characteristics of the municipalities of Priboj and Bijelo Polje (number of population, area, number of settlements, topography, local characteristics, major economic developments, etc.)

Municipality of Priboj

The municipality of Priboj is located in the southwestern part of the Republic of Serbia between 43°33'59" north latitude and 19°32'07" east latitude. It is located on the border of Serbia, Montenegro, Bosnia and Herzegovina. To the north it borders with the municipality of Čajetina, in the east with the municipality of Nova Varos, in the southeast with the municipality of Prijepolje. To the south it borders the municipality of Pjevlja in Montenegro, to the west with the municipalities of Rudo and Čajniče in Bosnia and Herzegovina. The8 total length of the border of the municipality of Priboj is 145 km. The municipality of Priboj covers an area of 552 km^2, which makes up 9% of the total area of the district. The municipality of Priboj lies at an altitude of 385 m. Priboj is located in the valley of the river Lim, i.e., it belongs to the area of lower Polimlje. It is located in a funnel extension of the Lim Valley surrounded by the mountains Pobijenik and Crni Vrh. The town relies on the bank of the river Lim on both sides for a length of 5 km. The municipality of Priboj has a distinctly mountainous character, its lowest altitude is 385 m, while the highest is 1500 m. It belongs to the old part of Serbia. The territory of the municipality is intersected by the valleys of the rivers Uvac and Lim as well as their tributaries. The Lima Valley extends south-north. It is the main element of the relief. The main watercourse of northeastern Montenegro and southwestern Serbia is the Lim River with the Uvac River as its main tributary. The territory of the municipality of Priboj is characterized by three basic types of climates: Župa 400-700 m above sea level, moderate-continental from 700-1300 m above sea level, and mountain is over 1300 m above sea level. This distinct climate diversity is due to 888the separation of relief and regional winds. The average annual temperature in Priboj is 9.3 °C, and in the plateaus 7.6 °C. Negative average monthly temperatures in the Lima Valley were observed in January -0.3 °C and February 0.7 °C. Depending on the altitude and location, the altitude zone of precipitation is clearly expressed. Thus, on areas of 394 m above sea level, the average annual rainfall is 752 mm. On surfaces and elevations of 953 m above sea level, the average annual rainfall varies between 850-900 mm. On average, there are 140 days of rainfall per year. As a special feature of the climate in this area, it should be noted that the Lima valley is often under fog during the year. Fog has the most from spring and autumn when there is a lot of sediment, while in the summer months it occurs exclusively at high temperatures. The territory of the municipality of Priboj is relatively rich in forests, which are unevenly distributed. Forests account for about 59% of the municipality's territory. In the composition of forests 2/3 are hardwood, and 1/3 conifers.

According to 2022 census data about 23,789 inhabitants live on the territory of the municipality of Priboj. The total number of households is 9,560, while the number of apartments is 13,513.

Municipality of Bijelo Polje

The municipality of Bijelo Polje is located in the north of Montenegro between 42° 55' and 43° 10' north latitude and 19° 30' and 20° 05' east longitude. It covers 924 km^2, which makes up 6.7% of the territory of Montenegro. This makes this city the fourth largest in Montenegro itself. Bijelo Polje municipality belongs to the

mountainous part of Northern Montenegro and is surrounded by high mountains. It is located between the mountains of Bjelasica, Lisa and Pešter plateau. The entire territory of the municipality is located at an altitude above 500 m. It is intersected by numerous valleys of rivers primarily Lim and its left (Hazelnut, Brzava, Ljubovića and Lipnica) and right (Goduška river, Ivanjska river and Bijelopolje Bistrica) tributaries that give it a special relief physiognomy. It is bordered by the Montenegrin municipalities of Pljevlja, Mojkovac and Berane and the municipalities of Prijepolje and Sjenica in Serbia. The municipality is characterized by a temperate continental climate, with clearly pronounced seasons, with autumn being warmer than spring, which favors the ripening of plant crops. The Bijelo Polje valley is surrounded by mountain ranges which affects the climate, temperature differences, silence, atmospheric precipitation and fog in the autumn and spring months. The average temperature in the estimated period is 8.7 °C, in the summer months it is 16.9 °C, while in the autumn months the average temperature is 9.4 °C. As for the winter period, the average temperature is 0.1 °C. During the blowing of the western and northwestern winds there is a lot of precipitation. The average rainfall is 940 liters per m2, with no major fluctuations over the years. Rainfall is evenly distributed throughout the year, so there are no markedly dry and extremely wet periods. The most precipitation occurs in November and the least in May. With the increase in altitude, the amount of precipitation increases, so the slopes of Bjelasica have about 1500 mm per year. The annual average is 109 rainy, 21 snowy, 23 clear and 135 cloudy days.

According to the 2011 census, the total number of inhabitants in the municipality of Bijelo Polje is 46,051, which makes up 7.43% of the total Montenegrin population. The population density is 49.8 inhabitants/km^2, which is significantly lower than the Montenegrin average and, at the same time, twice the average population of the northern region.

4.2. Institutional framework for waste management in the municipalities of Priboj and Bijelo Polje

The institutional framework for waste management in the Republic of Serbia consists of established and regulated responsibilities and functions of competent authorities, organizations and services in waste management. Waste management in the Republic of Serbia is carried out by municipalities through their public-utility waste management companies. The founders of public utility companies are precisely local self-government units that do not have a contract with these companies on the provision of services. These companies are responsible for organizing the collection and removal of waste, and have the right to collect these services from citizens.

Responsibility for waste management in the Republic of Serbia lies with local self-government units and its competent authorities:

Local self-government units perform the following tasks:

- prepare regional waste management plans in cooperation with other municipalities in the region. These plans must be in line with the Waste Management Strategy adopted at the national level.
- adopt municipal waste management plans that must also be aligned with the Waste Management Strategy.
- the spatial plan identifies the locations for the construction of waste management facilities.

- They are partnering with other municipalities for the purpose of joint waste management.
- Remediation and closure of landfills in accordance with the waste management plan.
- It stimulates the purchase of environmentally friendly products.
- organize the collection and safe disposal of waste in accordance with the standards and waste management plan adopted at the city/municipality level.
- Systematically educate and inform municipal structures and populations.
- they allow separate collection of secondary raw materials and organic waste, after which it is transported to regional waste management centers.
- they provide data in accordance with the regulations.

Competent authority of the local self-government unit in accordance with the Law on Waste Management:

- adopts a local waste management plan, provides conditions and takes care of their implementation.
- regulates, provides, organizes and implements the management of municipal, inert and non-hazardous waste in its territory.
- regulates the procedure of charging services in the field of management of municipal, inert and non-hazardous waste.
- issues permit, approvals and other acts in accordance with the law, keeps records and submits data to the ministry.
- At the request of the ministry, it provides recommendations and advice regarding the issuance of permits.
- supervises and controls the implementation of waste management measures in accordance with the law.

Municipality of Priboj

The Decision on Municipal Activities ("Official Gazette of the Municipality of Priboj" No. 3/09) is the basic implementation document regulating the rules and responsibilities in waste management in the territory of the municipality. In the territory of the municipality of Priboj, municipal waste management is performed by the Public Utility Company "Usluga". The main activity of this company is reflected in the following activities:

- purification and distribution of water,
- treatment and drainage of atmospheric and wastewater,
- maintaining cleanliness in the city and the settlements in the municipality,
- transport of passengers in urban traffic,

- arrangement and maintenance of parks, green and recreation areas,
- maintenance of streets, roads, lighting and other areas in the city and settlements,
- the maintenance of the landfill,
- maintenance of markets, public fountains and wells,
- maintaining and maintaining the cemetery.

The control of the work of this public company is under the jurisdiction of the municipal inspection.

Decision on determining the location for the disposal of bulky and construction waste ("Official Gazette of the Municipality of Priboj" No. 4/10) is a document that prescribes the method of disposal, competence for control lingering the application of this decision and defines the offense and liability for acting contrary to the provisions of this Decision. According to Article 1. these decisions the disposal of bulky and other construction waste can be carried out on the part of a specially marked area at the location of the city landfill Duboki Potok. The supervision for the implementation of this decision is carried out by the Environmental Protection Inspector .

Municipality of Bijelo Polje

The institutional framework for the implementation of the waste management plan in the municipality of Bijelo Polje consists of the following institutions and administrative bodies:

- Ministry of Sustainable Development and Tourism of Montenegro;
- Environmental Protection Agency of Montenegro;
- The Municipal Assembly of Bijelo Polje;
- Secretariat for Rural and Sustainable Development;
- Service for inspection affairs, municipal police of the municipality of Bijelo Polje;
- DOO "Komunalno - Lim" Bijelo Polje

The utility company is, in accordance with the Decision on municipal planning of the city, and in connection with the cleanliness of the city (Article 8), competent for:

- Collection, disposal and disposal of garbage and other natural and artificial waste (construction waste, car waste, etc.) from public and private areas;
- Cleaning and washing of public areas;
- Cleaning septic tanks;
- Removal of damaged and abandoned vehicles from public areas;
- Removal of corpses of dead animals;

- Maintenance and use of landfills.

Table 2 shows companies from the Polim region that are responsible for waste management.

Table 2. Municipal waste management companies in the Polimlje region

Ordinal number	**Municipality**	**Competence in waste management**	**Surveillance**
1.	Priboj	PUBLIC UTILITY COMPANY "Usluga"	Municipal inspection
2nd	Bijelo Polje	DOO "Komunalno - Lim" Bijelo Polje	Municipal Militia

Source: Local waste management plan of the municipality of Priboj, 2011 and Local waste management plan of the municipality of Bijelo Polje, 2016

4.3. Municipal waste

4.3.1. Quantities, composition and characteristics of municipal waste in the territory of the municipalities of Priboj and Bijelo Polje

Data on the quantities, types and composition of waste in the territory of a municipality are the starting point in the waste management planning process. The waste management planning process must be based on a reliable database of existing waste volumes, existing management methods, treatment, disposal methods, sources and types of waste.

The amount of waste generated in a given area depends primarily on:

- The number of inhabitants covered by the services of utility companies both in the urban and rural areas.
- The number of business entities operating in a particular territory.
- The average amount of waste generated per capita for a certain period of time for urban and suburban areas.
- A tourist season that significantly affects the accumulation of waste in tourist places.

The following table shows the amount of waste generated in the municipalities of Priboj and Bijelo Polje. Amounts of municipal waste per year were calculated on the basis of measurements of waste in reference municipalities, i.e., according to the methodology used in the National Strategies for waste management and master state plan in two countries Serbia and Montenegro.

Table 3. Total generated amounts of waste by municipalities of Priboj and Bijelo Polje

Municipality	Area in km^2	Number of inhabitants	Number of households	Amount of waste per day	Amount of waste t/yr
Priboj	552 km^2	27133	8920	32	11680
Bijelo Polje	924 km^2	42191	6930	187,67 m^3/day	68,500 m^3/yr.

Source: JKP "Usluga", JKP "Lim", DOO "Komunalno - Lim" Bijelo Polje

The morphological composition of waste represents the proportion of certain types of waste in the characteristic sample of waste. The morphological composition of waste is influenced by the number of inhabitants, the economic situation, climate, season, climate and geographical location. The mass composition is determined most in relation to paper food waste, organic waste, wood, metal, textiles, rubber, plastics, etc. Since it is composed of components previously managed by man, it generally does not contain hazardous waste. However, it still contains elements of hazardous waste (batteries, accumulators, electrical and electronic waste, medicines, chemicals for home hygiene, paints and varnishes, oils, pesticides, etc.).This type of waste is most dominant in the municipalities of Priboj and Bijelo Polje.

The next two tables will show the percentage composition of municipal waste in the municipalities of Priboj and Bijelo Polje. With the fact that the table for Bijelo Polje was separated because the local self-government did the assessment of municipal waste at the rural and urban level, which is not at the municipality of Priboj it was a case (Tables 4 and 5).

Table 4 provides data obtained by measuring 500 kg of representative sample of waste - a sample from a part of the municipality where the majority of the population is in collective and individual housing or is rural character.

Table 4. Percentage composition of municipal waste in the municipality of Priboj

The composition of municipal waste	Priboj (%)
Garden waste	8,15
Other biodegradable waste	33,95
Paper	8,55
Glass	6,55
File	5,41
Cardboard - wax	-

Cardboard - aluminum	3,84
Metal - packaging and other packaging	1,84
Metal - aluminum cans	0,74
Plastic packaging waste	3,81
Plastic bags	4,35
Hard plastic	2,33
Textiles	2,28
Skin	-
Pamper diapers	2,67
Fine elements	15,33

Source: PUC "Usluga", Priboj September 2011

Municipal waste in the municipality of Priboj, which is shown in the table above, is collected from the city settlement and larger settlements in the municipality, while rural areas are exempt from the waste collection system. Collected waste from the city and its surroundings is disposed of in municipal landfills that are not sanitary.

Table 5. Percentage composition of municipal waste in the territory of the municipality of Bijelo Polje (rural and urban area)

Types of waste	**Urban (%)**	**Rural (%)**
Organic waste	30,37	22,49
Paper	10,44	15,18
Glass	10,44	9,02
Heavy metals	0,47	0,47
Non-ferrous metals	2,37	0,76

Tree	1,42	2,47
Composite packaging	2,66	3,32
FIVE	6,55	6,64
Plastic	15,47	19,37
Textiles	0,95	1,80
Internal waste (shot , etc. .)	1,78	1,42
Hazardous waste	0,56	0,72
Green waste	1,66	1,92
Left	11,39	11,39

Source: DOO "Komunalno - Lim, Bijelo Polje, September 2016

This composition of waste refers to waste collected from households, commercial, industrial and administrative sectors and tourism. Green waste is also included, which is obtained from mowing green areas, pruning branches, landscaping cemeteries and other areas.

By laboratory route based on the middle sample, the mean density of waste as one of the basic parameters that determines the size of the space is 0.320 t/m^3. Based on this, the obtained data on the quantity composition of waste in tons on an annual level are given in Table 6.

Table 6. Annual values of municipal waste by species in the territory of the municipality of Bijelo Polje expressed in tons

Types of waste	**Quantity in t**
Organic waste	3868
Paper and Plastic	1569
Glass	1027
Heavy metals	134
Non-ferrous metals	198

Tree	305
Composite packaging	442
FIVE	671
Plastic	1436
Textiles	340
Inert waste	277
Hazardous waste	76
Green waste	615
Left	1090
Total	12053

Source: DOO "Komunalno - Lim, Bijelo Polje, September 2016

So far, no separation of hazardous waste from mixed municipal waste has been carried out, so data on the existence of this type of waste does not exist.

4.3.2. Special waste streams

Special types of waste are from electrical and electronic products, end-of-life vehicles, waste tires, waste batteries and accumulators, waste oils, waste packaging, construction waste, asbestos-containing waste, PCB waste, sewage sludge, medical and veterinary waste.

Municipality of Priboj

As for the municipality of Priboj, detailed records of special waste flows have not yet been made, according to data for this type of waste from the waste generator itself (Table 7).

Table 7. Showing the amount of special types of waste in the territory of the Municipality of Priboj

Special types of waste	**Quantity**			
	Which	**Kg**	**t**	**m^3**
Spent batteries	-	50	-	-
Batteries	10	-	-	-
Waste oils	-	-	Authorized operators take over	-
Waste tires	-	-	108	-
End-of-life vehicles	-	-	3	-
Waste from electrical and electronic equipment	-	-	1	-
Waste fluorescent tubes containing mercury	-	-	-	-
Medical waste	-	-	2	-
Waste of animal origin	-	-	0.5	-
Construction waste	-	-		5000
Waste containing asbestos	-	-	-	-
Waste from the exploitation of mineral resources	-	-	-	-
Energy waste	-	-	-	-

Source: PUC "Usluga", Priboj September 2011

Municipality of Bijelo Polje

Estimated quantities of special types of waste in the Municipality of Bijelo Polje, which is generated, collected and selected, are shown in Table 8.

Table 8. The amount of special types of waste in the territory of the municipality of Bijelo Polje

Types of special waste	**Quantities in t**
Electrical and electronic products	311
End-of-life vehicles	155
Batteries and accumulators	2,2
Tires	267
Packaging	4233
Waste oils	40345
Construction waste	6054
Medical waste	292 /65 per year
Veterinary and animal waste	-
Sewage sludge	1000
Industrial waste	2071

Source: DOO "Komunalno - Lim, Bijelo Polje, September 2016

4.4. Waste collection and transport

Waste collection means the collection of waste by the person in which it is generated, including the pre-classification of its components, temporary storage for further transport for processing or final processing. postponement.

Municipal waste collection consists of two stages:

- Installation of adequate bins and containers for the disposal of waste from households and commercial sectors.

- Collecting waste from containers, by directly transferring it from containers to garbage trucks of the so-called "car smear".

Below will be an overview of waste collection in the municipalities of Priboj and Bijelo Polje.

Municipality of Priboj

Municipal waste management in the municipality of Priboj was entrusted to puc "Usluga" in accordance with the Decision on municipal activities. On the basis of this decision, it is defined that PUC "Usluga" performs collection, transport and deposit of waste at the already existing city landfill. The decision relates to the territory of the city of Priboj. Currently, there is no decision on the systematic and organized separation of recyclable substances from municipal waste. However, PUC "Usluga" has taken a number of steps to introduce the recycling process. In addition to providing garbage removal services from households, these services have been extended to institutions, companies and private entrepreneurs throughout the municipality. In other local communities (villages) that are not covered by PUC "Usluga" with their services, there is no organized collection of municipal waste. There is also the biggest problem because the population dumps this waste on unregulated areas near the Lim River and this waste is just ending up in it.

Containers of 1.1 m^3 are placed in the central city zone and in parts with collective housing. Service users in other parts of the city use barrels, buckets and bags (Table 9).

Table 9. Availability of equipment for collection and transport of garbage in PUC "Usluga" Priboj

Types of equipment	**Quantity**
Containers of 1.1 m^3	320
Eco-friendly containers 5 m^3	21
Open containers 7 m^3	15
Open containers 5 m^3	5
Ecologically open containers 1.2 m^3	-
Street buckets of 30 l	30
Metal barrels 200 l	3250
Equipment for transporting waste	**Number of vehicles, carrying capacity and year of manufacture**
Waste Truck	FAP 1318, 13 m^3 load capacity, 2008

Waste Truck	FAP 1921, 13 m^3 load capacity 1988 year
Waste Truck	Volvo FL 6, 13 m^3 load capacity, 2002 year
Waste Truck	Ford, 16 m^3 load capacity, 2023. Age
Lifter	2 Mercedes 1213, 7 m^3, 1989/90 year
Ult – garbage straightening and sorting vehicle	Bulldozer TG 160

Source: PUC "Usluga" Priboj, September 2023.

Municipality of Bijelo Polje

In the municipality of Bijelo Polje, mixed municipal waste is disposed of by citizens and employees in the commercial and industrial sector. This waste is similar in its characteristics to municipal waste. It is prescribed the obligation of separate collection of primarily separated components of waste such as: paper, cardboard, metal, plastic, glass and biodegradable waste. The waste management activity is carried out by the company "Komunalno - Lim" which is registered for waste management. The list of equipment used by this company for the collection of waste is shown in Table 10.

Table 10 Availability of equipment used by the company "Komunalno - Lim" for waste collection and management

Type of equipment	**Quantity**
Container 1.1 m^3	181
Container 5 m^3	37
Vehicles	14
Tractor	3
Waste Truck	7
Tankers	3
Truck with crane	2
Truck for emptying semi-underground and overhead containers	1

Bulldozer	1
Tipper Truck	2
7 m3	1
Number of direct executors - cleaners	57
Semi-underground containers 3 m^3	2
Semi-underground containers 5 m^3	14

Source: DOO "Komunalno - Lim, Bijelo Polje, December 2022

The percentage of collected waste in relation to the generated is 80%, and if we look at the total percentage of collected waste at the level of Montenegro it is 89%. The percentage of selective waste is 0%. The area of the municipality from which the waste is collected is 901.17 ha or 1% of the total area. The waste collection service covers about 5,300 households, or 40%. The waste collection service is enjoyed by 16.256 inhabitants or 35.3%.

The annual amount of collected waste is estimated at 10,630 tons as determined by the state Master Plan for Waste Management. All waste is disposed of at a temporary landfill near the settlement Dobrakovo - "Biokovac-Kumanica", near the border with Serbia, at 100 m distance from the main road, and at 16.7 km from the city center. Despite the desire to expand the landfill , 104 wild landfills were identified. They are a big problem, because almost all the waste from them ends up in the Lim River. A plan has been made for their removal, but it is not being implemented. In addition, a plan for waste management at the municipal level is in the process, which would solve the process of waste collection through the recycling process with the participation of a private partner through public-private partnership.

4.5. Recycling activities and other waste treatment options

Waste reduction and recycling are the primary ways to reduce dependence on waste disposal and non-renewable sources. While there will always be a need for waste disposal, well-promoted and planned waste reduction and recycling programs can significantly contribute to reducing the amount of waste disposed of in landfills. Recycling is a source of valuable raw materials whose prices are rising in the market, and they can become a significant source of funding for both organizations and individuals. This will certainly lead to a reduction in waste management costs.

For all the municipalities concerned, it is noticeable that the difficult economic situation forced the population to collect waste and sell it to the Center for Recycling and Waste Collection of AD Prijepolje. This center is engaged in the processing of metal and other debris. There are also a number of private companies that do this. It often happens that metal waste is even sold to a nearby ironworks in Niksic (Montenegro).

Municipality of Priboj

10 multi-chamber containers (Paper, PET, aluminum cans) were installed in the city. Every 15 days these containers are collected, emptied, and paper and PET are pressed. The agreed price is unknown. Although the inhabitants of Priboj are informed not to throw anything but the mentioned waste into these containers, the population also throws organic waste into these containers. Therefore, for the purpose of waste separation, one employee was hired. The situation is not getting better, it's getting worse. For a time, these containers were so full of various types of waste that their separation was impossible, which forced a private company that processes and purchases paper, plastic and aluminum to reduce the amount of purchases.

PUC "Usluga" has 20 containers of 5 m^3 and 20 containers with a volume of 1.1 m^3 that have not been put into operation because there is not enough space for this waste to be selected, pressed and stored until the buyer buys it. The local self-government in Priboj has taken measures to solve this problem and is in the process of providing this space for the future recycling yard. The JKP also has a hydraulic press that it received from a donation from USAID (U.S. Agency for Regional Development Assistance). Also, this company has acquired a line for sorting and packaging waste paper in three categories: cardboard, printed paper and biotechnical paper. In addition, it also has a line for classifying PET packaging. With this, PUC "Usluga" shows that it is taking a number of steps to establish the recycling process itself in the area of the municipality of Priboj, and beyond. The state's action to sell old vehicles to the buyers helped in this, while obtaining a discount for the purchase of new vehicles. Fap Priboj factory has created a center for the purchase of old damaged vehicles and trucks, batteries, with an additional discount when purchasing new vehicles.

4.6. Waste disposal

Municipality of Priboj

Since 1983, the Municipality of Priboj, together with the Municipality of Nova Varos, has been disposing of waste at the landfill "Duboki Do" in the hamlet of Druglići. This landfill in the earlier period was also used by the municipality of Prijepolje until 1999 when the Landfill of Stanjevina was formed, which is located on the coast of Lim, which is a big problem, because this river pulls garbage from this landfill. In the body of the landfill "Duboki Do" is registered watercourse. The landfill has arranged internal roads, connection to a public road, is fenced on one side by an access ramp and has a green belt and water in case of fire.

During the day, a third-party machine is engaged in the landfill, which fills, controls the waste disposal process and prevents unauthorized presence. Solid waste is disposed of at the landfill. No form of waste treatment is present. The landfill is disposed of: municipal waste, metal waste, household appliances, all packaging waste, industrial non-hazardous waste, waste from public and green areas. This landfill does not dispose of hazardous waste from industry, medical and animal waste. The landfill has a use permit. The data on this landfill is available on the Environmental Protection Agency's website. There is no plan to repair this landfill.

This landfill does not meet the basic technical and sanitary requirements, and it is necessary to carry out its rehabilitation and closure. After the closure of this landfill and the formation of a new landfill, it is necessary to carry out its recultivation. The remediation and closure of the landfill must be aligned with the activities in the construction of the new landfill. Since all waste from the territory of the municipality of Priboj is disposed of inadequately, in cooperation with three other municipalities Sjenica, Nova Varos and Prijepolje, in 2007, the municipality of Priboj is disposed of inadequately. In 2001, an initiative was launched to build a regional sanitary landfill "Banjica". In accordance with the Waste Management Strategy in the Republic of Serbia, it is necessary to establish a regional waste management concept for the municipalities of Priboj, Prijepolje, Sjenica and Nova Varos. The regional centre will enable the sorting and separation of municipal waste, recycling, composting and waste disposal. It is envisaged that the regional center Banjica has a working zone with infrastructure facilities, storage space, a protective zone, internal and external roads. A line will be set on it for the separation of recyclable waste, while the residual organic fraction will be intended for composting. Waste that is deposited in landfill will be biologically stabilized and reduced in quantity. The regional landfill itself, which is part of the Regional Waste Management Center, is intended for the disposal of non-hazardous municipal waste. It must be built in accordance with the legislation and in compliance with all environmental regulations.

Municipality of Bijelo Polje

Disposal of collected waste in the territory of the municipality of Bijelo Polje is carried out at the location of the temporary landfill Kumanica (Table 11).

Table 11. Average annual waste amounts at the Temporary Landfill Kumanica in the municipality of Bijelo Polje (Montenegro)

Type of waste	**Quantity (t)**
Municipal waste	6600
Waste from businesses and institutions	2200
Industrial waste	500
Waste from public areas	1100

Source: DOO "Komunalno – Lim, Bijelo Polje, September 2016

5. FUTURE WASTE MANAGEMENT PLANS IN THE TERRITORY OF THE MUNICIPALITIES OF PRIBOJ AND BIJELO POLJE BASED ON EXISTING WASTE MANAGEMENT PLANS

Municipalities of Priboj and Bijelo Polje have defined future directions and priorities of action in order to better manage waste in their waste management plans.

Municipality of Priboj

The waste management system defined by the waste management plan of the municipality of Priboj for the period from 2011 to 2020, implies that the existing waste management system is followed by elements of the future infrastructure for waste management in the territory of the municipality of Priboj, where activities related to the recycling of part of municipal waste will be included.

The proposal of the future waste management infrastructure includes:

- expansion of the coverage from the collection of municipal waste, which is accompanied by the procurement of a large number of special waste collection vehicles with a press and containers with a capacity of 1,1 and 5 m^3,
- establishment and maintenance of a network of containers for primary selection as the basis of initial systemic recycling activities.
- construction of a recycling yard in Priboj,
- remediation of existing garbage dumps,
- the construction of the waste landfill.

In addition to the above infrastructure, the waste management plan also plans the following activities:

- Dangerous waste: In accordance with the Waste Management Strategy in the Republic of Serbia, it is necessary to organize occasional actions for collecting hazardous waste from households.
- Package waste: establish a separate waste collection system.
- Vehicles: Secure locations near the city for temporary storage of damaged vehicles.
- Flat tires: anticipate collection locations.
- waste from electronic and electrical equipment: anticipate collection sites.
- Municipal sludge: near the wastewater treatment plant that will be built will also allow the treatment of municipal sludge.
- Waste of animal origin: installation of refrigerated containers.
- Waste oils: allow separate collection of waste engine and edible oils.
- O thin batteries and accumulators: provide places to collect.

- Single hazardous waste: further develop the separation of infectious medical waste at source and treatment in autoclaves.

The system of comprehensive expansion of municipal waste collection in the municipality of Priboj implies that municipal waste collection is extended to rural households, bearing in mind that 100% of the city population is covered this system and only 6% rural. The expansion of the scope of municipal waste collection includes the following rural areas: Sjeverin, Sastavci, Mokronozi, Uvac, Štrpci, Her Goleša, MZ Banca and Kapela Dobrilovići. The expansion plan also covers suburban areas in Priboj. This plan envisages that the process of collecting waste covers 80% of the population from the territory of the municipality. To achieve this goal, it is necessary to purchase a certain number of special vehicles - car scrapers as well as the required number of containers of 1.1 and 5 m^3. List of necessary equipment for municipal waste collection envisaged by this plan for the period from 2015 to 2024. The year is in Table 12.

Table 12. List of the required number of containers to be purchased for the expansion of municipal waste collection in the municipality of Priboj for the period from 2015-2024. Year

A list of equipment	**Quantity in pieces**
Containers with a volume of 1.1 m^3	20
140 l buckets	150
Containers for separate collection of recyclable waste ("green islands")	29
Containers for separate collection (paper, glass, PET, metal)	4

Source: Local waste management plan of the Municipality of Priboj 2011-2020

The local and regional waste management plan also envisages institutional changes in the future in order to improve the waste management system. Activities in this area are as follows:

- Capacity of the municipal administration to establish an integrated waste management system.
- Fix a regional waste management company.
- A private partnership for waste management.

Municipality of Bijelo Polje

Based on the data from Chapter 4 , it is possible to carry out a relative estimate of the amount of waste in the municipality of Bijelo Polje by 2036. [Getty Images] The amount of waste and its morphological composition depend primarily on a number of factors: the number of inhabitants, the volume of industrial and agricultural production, the volume of development of the municipality, the degree of the development of tourism, the level of

development of primary selection, i.e., separate collection of various components of waste and the efficiency of implementation of reuse and recycling procedures in the Municipality.

Making a precise analysis of all the above parameters is almost impossible, given that there is not a large number of relevant data, or it is difficult to obtain, so the assessment of waste is which may arise in the following period determined in proportion to the number of inhabitants and the number of tourists who visit Bijelo Polje (Table 13).

Table 13. Projection of the amount of waste in the municipality of Bijelo Polje in the period from 2016 -2036

Years	**Quantity in t**
2016	12th125
2017	12th125
2018	12th174
2019	12th198
2020	12th223
2021	12th247
2022	12th272
2023	12th296
2024	12th321
2025	12th345
2026	12th370
2027	12th395
2028	12th420
2029	12th445
2030	12th469
2031	12th494

2032	12th519
2033	12th544
2034	12th569
2035	12th595
2036	12th620

Source: Local action plan of waste management Municipality of Bijelo Poil for the period 2016-2020. Years

The overall objective to be achieved by implementing this plan is to establish a sustainable waste management system and to continuously improve it.

The main objectives in the field of waste selection, reuse and recycling to be implemented in the future are as follows:

- With a reduction in the amount of municipal waste generated and which needs to be disposed of at the landfill;
- Material for recycling as a resource and its use as a way of preserving existing natural resources should be extracted from the total mass of waste in the simplest and fastest way, before its disposal in mixed municipal waste;
- Other products that have their own value or special structure to be extracted and specially treated;
- In the process of production of finished products, reduce as much as possible and save energy;
- The environment and the health of people is maximally protected.

The specific objectives in the field of waste selection, by new use and recycling are:

- Administrative capacities of institutions and bodies in charge of spatial planning have been issued a permit, control and monitoring.
- In managing the system of mandatory recording of types and quantities of collected waste and reporting to the competent administrative authority for the tasks of regulating the public and environmental protection
- The expansion of the waste collection system throughout the territory of the municipality.
- Leaving the necessary elements of the system for separate collection and sorting of waste.
- Increasing the amount of waste for recycling including industrial waste.
- Project and construction of facilities with the same for waste management.
- Establishing a system of management of medical, pharmaceutical, veterinary, and hazardous waste.

- With the prevention of illegal waste disposal and from nations of unregulated landfills.
- In the establishment of a system of speech of the waste producer.
- With the enforcement of legal regulations and the measures arising from it.
- Raising public awareness of the importance of proper waste management and incorporating publicity in the decision-making process .

The main task in waste management in the territory of the municipality of Bijelo Polje is to reduce the amount of waste generated in its territory, then as efficiently as possible the implementation of primary waste selection as preconditions for re-use and recycling of waste materials, then a more efficient system of collection and transport of waste, which is treated in an adequate manner depending on the type of waste and the possibilities of the waste management system. The plan sets the goal of achieving 2020. About 50% of waste such as paper, plastic, glass, metal preparation for reuse and recycling. In addition, the plan envisages that in the future as much as 70% of non-hazardous construction waste will be recycled and put into use.

As for municipal waste, it is necessary to strive for primary selection, simplify it and bring it closer to the population, while constantly encouraging its activity, raising public awareness of the necessity of his actions and the benefits that such selection brings. this plan until 2020. The following activities are planned for years:

- In setting at marine selection on the principle of two buckets - dry and wet.
- in setting up a network of waste collection in rural settlements and organizing the collection of dry components about waste in them (packaging waste).
- construction of a recycling yard.
- procurement of missing equipment (bins, containers and vehicles) for collecting materials for recycling.
- To work more closely with recyclers.
- improving the database on municipal and other types of waste.
- reducing the amount of waste that is disposed of in landfill.
- Intensifying activities to strengthen public awareness by organizing campaigns and forums, informing citizens through the media, organizing actions of collecting certain types of waste and various attractive campaigns;

6. CROSS-BORDER COOPERATION BETWEEN THE MUNICIPALITIES OF PRIBOJ AND BIJELO POLJE ON WASTE MANAGEMENT IN THE LIM RIVER VALLEY

6.1. The Lim River is the largest floating dump in Europe.

Rivers and lakes - the most important waters in Serbia are daily released industrial chemicals and feaces from urban settlements that spread an unbearable smell around. On the other hand, plastic bottles, dead fish, waste tires and other material float on their surface. According to experts, this can also be dangerous to human health. The main sources of pollution of rivers and other water resources in Serbia are:

- industrial plants,
- municipal wastewater from settlements,
- agriculture - through the use of other fertilizers and chemicals.

Ana Milovanović-Pešić, research associate at the Department of Physical Geography at the Geographical Institute "Jovan Cvijić" at the Serbian Academy of Sciences and Arts (SANU), said in an interview with the BBC in Serbian that the degree of contamination of rivers in Serbia is determined on the basis of physical, chemical, biological parameters of the quality of surface and groundwater. Watercourses can be divided into four classes, although there are also those that are out of class.

Milovanovic Pesic argues that the classification of rivers in Serbia is carried out on the basis of two groups of criteria:

- The ones that are characterized by ecological status
- specific ones that include hazardous and toxic substances that get into the water due to anthropogenic and industrial activities.

Most of the rivers in Serbia belong to the second and third class, while the first belong to smaller mountain watercourses and the upper flows of rivers with clean water, while the fourth category includes highly polluted waters.

As examples of the most polluted rivers in Serbia, Milovanovic Pesic cites the Danube-Tisa-Danube canal in Vojvodina, especially the Great Bačka Canal, Borska Reka, Pek and Lim.

River Lim will have priority in this chapter since the study deals with solid waste that ends up in it from the surrounding legal and illegal landfills in the municipalities of Priboj and Bijelo Polje.

The Lim River is the largest floating landfill in Europe whose surface cannot be seen from plastic bottles, waste tires, household appliances and other waste (animal corpses, branches, shrubs). Even tin crates of those who died from COVID-19 are thrown into it. This floating waste often threatens the operation of the hydroelectric power

plant "Potpeć", so from every year an action is organized to clean up Potpeć lake from which about 7500 cubic meters of floating waste is extracted annually (Figure 6).



Figure 6. Lim River - covered with waste (https://www.bbc.com/serbian/cyr/srbija-55531709)

Priboj, the Lim River and its banks have been threatened for years by floating waste coming from the upper course of The Lim, all from sources in Montenegro. Environmental activists cite the existence of a non-sanitary landfill Of Stanjevina, which is located along the main road to Montenegro, as well as a number of smaller wild dumps as the main cause of the problem. According to estimates, there are about 80 wild landfills along the coast of Lima. Since the Landfill Stanjevina is closed, all waste is now disposed of at the "Duboki Potok" landfill in Prijepolje, which was discussed in the previous chapter.

The situation changes when the water level of the Lim River rises, with horrifying scenes occurring. After the closure of the landfill Stanjevina most of the waste comes from Montenegro, In Bijelo Polje there is an industrial zone on the coast of Lim. In Berane there are two car wastes on the coast of Lim where what cannot be sold is stored - bumpers, tanks, roofs. This waste is most endangered by the coast of Priboj, which further endangers the Drina River, where it comes, which endangers the operation of the Višegrad hydroelectric power plant.

With more than 50 wild landfills in the Lima basin last year, about 1,500 cubic meters of garbage were extracted. This amount of different waste poses a great danger, not only to the ecosystem, but also to the infrastructure because the accumulated garbage deposited in the riverbed changes its course, but also significantly increases the chance of spillage as soon as there is heavy rainfall.

6.2. Measures for the protection of the River Lim from floating waste pollution undertaken by the municipalities of Priboj and Bijelo Polje

As the Lim River waste problem has become a burning problem, a broader initiative has been launched to solve this problem for a long time. As a first step, talks between interstate and inter-municipal delegations from Serbia-Montenegro were launched. The problem itself requires comprehensive involvement of both sides, because it is obvious that most of the waste comes from the upper course of the river that goes from Montenegro. If the process of waste management in the Lim river coast is arranged only through Serbia, the problem is not solved. What activities are the municipalities of Priboj and Bijelo Polje undertaking to clean up the Lim River - conclusions from the conference held in March 2023.

In addition to the current project "Protection of the natural environment of Polimlje from waste", partner municipalities (authorized PUC) regularly remove wild landfills. In addition, sports and nautical clubs remove waste from inaccessible places on the river, especially before rafting competitions and recreational activities (Lim Regatta).

The measures taken by the Municipality of Priboj together with other municipalities in Serbia through which Lim flows in order to clear its bed of floating waste are:

- Building an access road to the river.
- Construction of an ecologically floating barrier.
- Construction of a dam along the old Landfill Stanjevina so that waste would no longer go into the river.
- Rehabilitation of wild landfills next to the river itself, their reclamation, installation of various furniture for garbage collection and construction of parks.
- Construction of a new regional sanitary landfill for the municipalities of Priboj, Prijepolje and Nova Varos where waste disposal and treatment would be carried out.
- Organizing environmental education for citizens in order to raise environmental awareness of citizens about waste disposal.

During 2021, at the competition of the Ministry of Environmental Protection of the Republic of Serbia, the municipalities of Priboj and Prijepolje received 70 million dinars in order to install three floating cables that would prevent waste from floating on the lake, but to collect it in one place. During floods in January 2023, the barriers themselves managed to withstand a large burst of water and contain huge amounts of garbage.

In general, this state of affairs is caused by the unsystematic approach of actors focused on polymeric applied ecology and socio-economics. Partial resolutions did not produce satisfactory results and stakeholders concluded that only a better organized and managed common systematic approach in the CB region will yield better results including synergistic effects, a higher level of sustainability, durability and portability. This will produce good multiplicative effects thanks to the involvement of a wide range of stakeholders who are not randomly collected, but mobilized focused organizations and individuals.

In order to resolve this "knot" and initiate joint action of the Municipality of Priboj in Serbia and Bijelo Polje in Montenegro, they applied in the Cross-border Cooperation Programme Serbia and Montenegro, which is co-financed by the EU with 85% of the funds and they were approved the project "Protection of the natural environment of Polimlje from waste". The main goal of the project is to protect the Lim River from floating waste. The total value of the project is 366,250 euros. The executors of the 18-month project are the appropriate PUC from both municipalities, "Usluga" from Priboj and "Komunalno - Lim" from Bijelo Polje.

The partners jointly planned and announced the objectives during the development phase of the project. They took into account all aspects of the necessary preconditions and the projected objectives in close correlation with the program requirements and recommendations. The overall objective "Establishing technical and organizational preconditions for providing environmental management capacities in Polimlje for the protection of the Lim River Valley from waste pollution" is planned to produce the most adapted impacts on the target area of cross-border cooperation in accordance with the following facts:

The framework published by the CfP regarding the objectives of the programme, impact indicators, priorities, resource availability (in particular financial and project duration) and the possible limits of intervention logic that will cause the production of outcomes and outputs on SMART principles.

Proposed activities that will provide results and outcomes and ensure sustainability, durability and portability of results after the project. This aspect is very important for partners because they plan to submit an average of 10 project proposals ready for implementation immediately after the completion of the current project. This proposal will be a kind of "feasibility study" for future investors and donors.

Pre-project situation that conditioned the current status for the start of project activities. Without this, taking into account real facts on the ground could increase risk opportunities and reduce the room for maneuver to be realized. Specific objectives are designed to ensure that the planned impacts on the well-tailored intervention logic are achieved.

Through specific objective 1 "Securing technical capacities for waste management in Polimlje", partners will support with the necessary and missing equipment in their own technical waste management bases. In addition to the immediate possibility of intervention in Polimlje, these devices will serve for training and tactical acquisition of common knowledge, skills and experience in waste management. These include: garbage truck in Priboj, catamaran for collecting floating waste on Potpeć Lake, collecting truck for Bijelo Polje PUC "Komunalno-Lim", electronic scale for measuring waste, 2 barriers for catching floating waste on the River Lim in Bijelo Polje, hand tools for catching floating waste (nets, hooks, acceptance nets (meredov)),

In specific objective 2: "Providing an improved business-supporting environment and an environment that supports a partnership to protect Polimlje from waste pollution" partners will strategically strengthen their capacities. They will strive to achieve the following goals:

Preparation of "ready for implementation" of 10 project proposals, a kind of "feasibility studies" for investors and donors for further realization of more extensive and complex undertakings in the target area.

Raise awareness in the community about waste management and profit from it: environmental protection, waste recycling and a higher level of socio-economics in the tourism industry.

All these results will contribute to an improved environment for investors in tourism and related branches and a better level of cross-border area for joint waste management intervention in the future).

It is particularly significant that responsible organizations from the two countries directly affected by previous mismanagement of floating waste will act in sync to make the effect of removing floating waste more effective, efficient and rational.

An example of such cross-border cooperation between the two municipalities, which are perhaps the darkest points on the entire course of Lim, should encourage a change of consciousness in all municipalities through which Lim flows on its 220 km long road to the mouth of the Drina River in Bosnia and Herzegovina. According to data from the company "Hydroelectric power plants on the Drina" in Bosnia and Herzegovina, about 6-7 thousand cubic meters of waste are collected at the mouth of the Lim and the Drina, of which Lim brings about 45% of waste.

The two local governments have already collaborated on the implementation of a similar project back in 2019. In other news, The Hague-based International Criminal Tribunal for the Former Yugoslavia (ICTY) has been responsible for removing about 20 wild landfills on the banks of the Lim River. The area where these landfills were is recultivated, greened and enriched with park furniture.

7. BEST EXAMPLES OF WASTE MANAGEMENT IN EUROPE AS A GUIDE TO THE RECOVERY OF WASTEMANAGEMENT SYSTEMS IN THE MUNICIPALITIES OF PRIBOJ AND BIJELO POLJE

There are many good examples of waste management in Europe. These good examples show how waste can be recycled for reuse or further used to generate electricity and heat. It is very important to emphasize the very high awareness of the way of waste disposal. The best examples in waste management are the Italian city of Milan o and the Slovenian capital Ljubljana. Therefore, they will be discussed further.

7.1. Milan (Italy)

Milan is one of the leaders in the field of waste management in Europe. AMSA - a public company for managing solid municipal waste is in charge of waste collection in Milan. AMSA is responsible for collecting and disposing of waste in the city of Milan and 12 other municipalities in the province and covers about 1,600,000 inhabitants, of which about 800,000 in the city itself.

In Milan, waste disposal was abolished in 1997, while the city itself was divided into four departments (waste collection points), with four recycling yards. All waste that is not recycled is used for incineration from which heat

and electricity are obtained. In 2014, about 770,000 tons of waste were collected. The company owns a total of 1,400 vehicles, 30% of which are gas-fired.

Waste collection in Milan is carried out on the principle of "doorstep" (door-to-door). The advantages of such waste collection are better separation and quality of waste. Although at first glance it seems strange the positive effects of hygiene in this kind of waste removal are visible, because waste does not stand on the street. In the photo below, a street in the pruning area of Milan is shown on the day when the waste is taken away. Such a sight can only be seen for a few hours until the waste is taken away (Figure 7).



Figure 7. A picture of a street in Milan when waste is taken away with one day of the week (https://zelenidijalog.rs/milano-primer-dobre-prakse-upravljanja-otpadom/)

Such separate waste is an advantage for the municipality, because it is cleaner and forwarded further, which allows for a new valorization and a new product. The quality of such collected waste for incineration is between 10-11,000 J, while sometimes there is no need for treatment before the same because the waste is already of good quality. The waste is collected in five separate fractions of municipal waste in visibly (colored) bins.

- white buckets: paper,
- green buckets: glass,
- brown buckets: food and biodegradable waste,
- yellow bags: PET and metal,
- neutral transparent bags: mixed waste.

For all possible doubts about the type of waste and disposal in appropriate containers, citizens can find detailed explanations on a special page within the AMSA website where which type is disposed of. For other

fractions of household waste and, such as for example bulky waste there is a service that comes by invitation and waste takes away free of charge. Hazardous household waste is disposed of : batteries in stores provided for this, medicines in bins located in front of each pharmacy (pharmacy pays a tax for waste removal and is obliged to provide a specific bin from which it is not possible to remove waste, while the municipal company takes away waste. The collection of waste is carried out twice a week , by citizens taking out bags and bins in front of the building the evening before the arrival of the municipal citizens. For example, in one of the parts of Milan, paper and glass are taken away once a week on Tuesdays, while wet biodegradable waste is taken twice a week. In the meantime , the waste is stored in an internal landfill that each building has in the building itself or in the yard. All bags in which biodegradable waste is disposed of are also biodegradable in accordance with the EU reference recommendations . That waste is ready for composting. An additional benefit of this kind of waste taking out is that the bins do not get dirty, while tenants have an obligation to wash them, and not the company itself. In the composition of biowaste that citizens separate, only 4% is not biodegradable, that is, suitable for composting. The removal and removal of waste takes place on certain days from 7-9 hours, including the periphery. All waste due to the large territory was collected no later than 11: 30. In addition to vehicles for individual fractions, there are also vehicles that have partitions for carrying two fractions each. For the management of such vehicles (and transport and collection / waste collection) it is mostly necessary one person, while for larger vehicles, they are mostly engaged two. Collecting and carrying vehicles generally operate 6.5 hours a day. Large cities generally have a separate truck/vehicle for waste collection/removal for each fraction, while in smaller towns/municipalities the same truck has been used in different zones for different fractions ever since. In Milan, about 30% of the fleet used for waste removal purposes uses (methane) gas produced from collected biodegradable waste.

Quality control of collected waste is carried out on the spot (transparent bags), and 25 inspectors for quality control of waste are hired, and if they encounter irregularities – inadequate time of removal or waste is separated in an inappropriate way, the assembly of tenants is punished (for inadequate distribution of waste the minimum penalty is 50Eur, and the maximum 400Eur if the waste is thrown unseparated). This way of working is supported by 90% of citizens, and the idea is not to act repressively.

All the bags in which the waste is disposed are transparent, which allows a visual inspection when collecting. If the waste is not adequately separated, a penalty is written to the home counsel. Each building within the house council has a person who is in charge of maintaining the hygiene of the building who is at the same time in charge of waste management and who is paid for it by the assembly of tenants. Bags for special fractions of waste are purchased by the tenants' assembly, which later distributes them to the tenants, while bins for separate fractions are provided by AMSA, and are purchased from a fee that citizens pay for carrying waste.

In Milan itself, more than 50% of municipal waste is separated on the spot. Further inspection of collected waste is done separately (100km from the city) and is part of AMSA, where cleaning is carried out before final sending to associations for processing special waste flows - National Consortium of Packaging Companies, which

includes associations for separate types (glass/paper/PET). On average, about 95 kg of organic waste is collected per person/gpd and it is only from food waste (about 25% is from the commercial sector, while 75% is from households). There is less than 4% of the non-compost material in the bags.

As for the payment of waste taxes, the annual cost of collecting and taking away waste in Milan is about 100-120 euros per capita, but it is calculated on the principle of combining the area of the apartment and the number of household members (on average about 55Euros).by the member). The municipality issues one invoice to households (in June for the next 12 months) for the annual amount of the service, but the payment is quarterly.

7.2. Ljubljana (Slovenia)

Ljubljana, the capital of Slovenia, is also a good example in waste management in Europe, as it has the most modern waste collection and processing plant in Europe, which is RCERO-Ljubljana.

The Regional Waste Management Centre (RCERO Ljubljana) is the most modern waste treatment plant in Europe and the best example of regional cooperation in Slovenia , uniting 58 municipalities. Their facilities and facilities process the waste of more than 800,000 residents with sustainable and innovative technology. The total value of the project for the construction of the RCERO regional centre in Ljubljana amounted to 155m euros. For the 2007-2013 programming period, the EU Cohesion Fund contributed EUR 77.5 million (61.02% of funds) through the operational programme "Development of Environmental and Transport Infrastructure", while the sources of the remaining funds are from the states (13% of funds), municipal budgets (22.91% of funds) and environmental taxes for environmental pollution due to waste disposal (3.07% of funds)."

The key mission of the Regional Center is to extract as many useful materials and raw materials as possible from mixed waste and to produce compost from separately collected biological waste. The regional center consists of an expanded landfill, a wastewater treatment and waste treatment plant. The new landfill has been in use since 2009. In 2011, the wastewater treatment plant was completed in 2011. The construction of the facility for biological and mechanical waste treatment, which was the most complex part of the project, was completed at the end of 2015. [Getty Images] The key part of the regional center are three facilities where biological and mechanical waste treatment takes place. Two types of waste are processed in these facilities: separate collected biological waste and

the rest of mixed municipal waste. This is a diagram and a diagnostic (Figure 8).



Figure 8. Regional Waste Management Centre RCERO Ljubljana (https://www.vokasnaga.si/rcero-ljubljana/)

RCERO Ljubljana provides:

- long-term regulation of waste management issues for a third of Slovenia;
- the best and most modern waste treatment system in Slovenia;
- use of state-of-the-art and sustainable waste management technology on a European scale;
- an example of good practice in the field of integration and cooperation of municipalities and connecting the element of waste management in Slovenia between municipalities and regions;
- green jobs.

Facilities and devices built within the RCERO Ljubljana enable:

- production of green electricity from renewable sources, from biogas;
- obtaining compost from biological waste, which is of the highest quality and is used in horticulture;
- obtaining secondary fuel from the light fraction of mixed municipal waste;
- production of electricity and heat for their own needs;
- after processing, less than 5% of waste that cannot be reused as raw material or energy source ends up in landfill, and this disposed waste has no adverse effects on the environment;
- the implementation of the circular economy in practice.

The key part of the regional center are three facilities with mechanical-biological treatment of waste. Biological waste treatment facilities are in warm colors, due to the processes that take place in them, while on the

other hand there are facilities for the processing of mechanical or mixed waste in cold blue and green shades. Mechanical treatment of waste produces useful substances for recycling and production of solid fuel. After processing, less than 10% of waste is sent to a safe landfill "Barje".

In the biological treatment of bio-waste, the same processes that occur in nature are used, only here the process is much faster and oxygen is not used. Anaerobic fermentation takes place in reactors in the presence of bacteria that obtain compost from separately collected biowaste. During fermentation, a lot of gas is generated, which is captured and used to produce electricity and heat. The high-tech process of mechanical waste processing allows as many useful materials and raw materials as possible to be extracted from mixed municipal waste.

RCERO Ljubljana uses state-of-the-art technology, "Rastko" compost is produced in the process of processing separately collected bio-waste, which is of the highest quality. Compost is suitable for use in gardens and fields.

The waste treatment plant, as it is popularly called RCERO, uses state-of-the-art and sustainable waste management technology on a European scale and provides green jobs, and with the constant learning of PE "Voca Power" improves the aspect of waste management according to the principles of circularity in a creative economic way.

CONCLUSIONS AND RECOMMENDATIONS

Waste management requires the existence of a system. In order to be able to talk about an integrated waste management system, it is necessary to make decisions from scratch, that is, on several fronts: closing non-sanitary landfills is not possible without the construction of sanitary landfills, at the same time their construction is not possible if primary and secondary separation is not carried out, while it is not possible to do the same if the price of waste removal is not economic.

The ten basic things that need to be done to establish a waste management system that produces results are as follows:

- Respect the waste management hierarchy;
- Establish primary waste selection;
- Introduce an adequate price of utility services;
- Introduce taxes to disincentives waste disposal in landfills;
- Education of citizens;
- Build sanitary and remove non sanitary landfills;
- Introduce a deposit system for packaging;
- Build a plant for the treatment of hazardous industrial waste;
- Enable the extraction of energy from waste;

- Ban oxydegradable bags.

The municipality of Priboj, which is the subject of this study, has a very low rate of waste management. The first waste collection included a small part of the municipality's territory, i.e., only the city core and a very small part of the rural area. Another very important thing to note is the existence of wild illegal landfills. There are plenty of them in addition to the clean-up action carried out within the cross-border programme with the Municipality of Bijelo Polje. Landfills are mainly located on the coast of Lim, since this municipality on both sides relies on the Lim River for a length of 5 km. There is very little awareness of the importance of proper waste disposal. Many people dump all kinds of waste on the coast of Lim, starting with municipal waste, hazardous waste, household and electronic appliances, animal corpses, etc. During major floods, Lim pulls away a large part of this waste, so this river is today the blackest point in Europe. From the cleanest river, it became the largest floating dump in Europe. This waste itself threatens the operation of the hydroelectric power plant "Potpeć" and the Bistrica reservoir, further this waste goes to the Drina, where it also threatens the operation of the Višegrad hydroelectric power plant. In addition to wild landfills, the main problem is the non-sanitary landfill Stanjevina, which for many years was the main point where the municipalities of Priboj, Nova Varos and Prijepolje disposed of large quantities of waste. Now this landfill is closed, but it has remained and has not been remediated, so that during floods a large amount of waste ends up in the river itself.

In order to somewhat solve the problem of waste on this river, during 2021, the municipality of Priboj received about 70,000,000 dinars at the competition of the Ministry of Environmental Protection of the Republic of Serbia for the construction of two chain cables, where waste would be collected. This has yielded results, so during this year's great floods, the sprocket withstood a rush of water and retained a lot of waste. In addition, with this project, the municipality of Priboj procured a truck for collecting waste from the river. This waste is taken out of it every year and taken to the regional landfill Duboko near Užice.

As for the Municipality of Bijelo Polje, this municipality has a slightly better regulated waste management system. Namely, there is a large number of wild dumps along the coast of Lim, so the largest amount of waste comes from the upper course of the river that flows in Montenegro. The industrial zone in Bijelo Polje is located right on the coast of Lim, so that on the coast large quantities of waste are disposed of in unforeseen locations. Other municipalities in Montenegro through which Lim flows, such as Berane, also have this problem.

Both municipalities have institutional framework for waste management defined through existing legislation and established public companies within this field of work.. The municipality of Bijelo Polje is in a slightly better situation, because its plan is more comprehensive and detailed due to the fact that there is a clearly defined database of the types and quantities of waste that occur in the territory of the municipality and clean action plan for the next period.

Nevertheless, in order to work more intensively on solving the problem of waste on the Lim River in the long term, these two municipalities in the previous period received funds for two projects of cross-border cooperation on the protection of the Lim River. The first project is successfully completed in 2019. In other news, The Hague-based

International Criminal Tribunal for the Former Yugoslavia (ICTY) has since removed about 20 wild landfills, which were later recultivated and turned into green oases. At the end of this year, the two municipalities launched a cross-border cooperation project called "Protection of the adjacent environment of Polimlje from waste", which aims to clean the Lim River of floating waste. With this project, whose value is about 366,250 euros, it is envisaged that the company "Komunalno-Lim" will be provided with funds for the installation of two floating sprockets for collecting waste on the River Lim in the length in which it passes through Bijelo Polje and a suitable truck for the collection of collected waste, while the PUC "Usluga" received funds for the purchase of a car repair shop for collecting waste from the already existing sprockets that have been placed on Lim in this municipality and a boat of katarmans that would help collect waste from the free areas of Potpeć Lake.

Through the specific objective of 2 of this project: "Providing an improved environment that supports business and an environment that supports the partnership for the protection of Polimlje from waste pollution" of the municipalities of Bijelo Polje and Priboj will strategically strengthen their capacities and lay the foundations for further cross-border cooperation in the next medium term.

In order to effectively manage waste and protect the River Lim in the territory of the municipalities of Priboj and Bijelo Polje, it is proposed to implement following activities:

- Improve legislation in the area of waste / national and local level
    - Renew planning documents of waste management and make proposal for its improvement in the areas where it is needed
    - adjust relevant legislation with EU directives where aplicable in line with the recommendations given by the EU in the Progress report for last year and/or in direct communication.
- Strengthening of institutions included in the waste management policy and implementation
    - strengthening level of cooperation among all sides of relevance and involved in the waste management on the central and local level
    - encouraging the holding of regular meetings between the key staff of the relevant Ministry and the municipalities in order to created a spirit of common purpose and helped clarify what was happening nationally and at the local level
    - strengthening of the role and capacities of local self-governments in the area of management of waste
    - strengthening of the capacities of the (environmental) inspections to achieve full stakeholder compliance with theirs legal obligations at the state and local level as well as their advisory role in order to introduce legal obligations at the state and local level to the stakedolders
    - development of training and support programs for municipalities in order to strengthen the competencies of employees in municipalities;

- organizing national forums/conferences/seminars in order to create platform for the exchange of knowledge and experience between different interested parties and / or stakeholders.

– awareness and promotion campaigns

- campaigns: radio, TV hosting on different subject,
- advertising: billboards, mobile applications, social media advertising, etc
- door to door activities, conversation with the citizens of certain area, offering them help and giving feedback and guidance on certain issues
- social media activities and promoting campaigns
- direct marketing – flyers, organizing an event, exhibition, etc
- TV campaign with titles and messages with slogans that are easy to remember
- community involvement through f.e. school working groups, actions on cleaning, actions on selection of waste, etc.

– financing of the projects

- fees and tariffs in line with relevant legislation and existing rulebooks
- introduction of the "pay as you throw" system

Beside abovementioned, activities that also could be implemented are following:

– Expand the scope of collection of municipal and other waste throughout the municipality including rural areas where possible

– Establish a single database on the types and amount of waste throughout the territory of municipalities, perform periodic waste assessments in the future.

– Organize public forums, discussions and lectures where citizens would be educated on the importance of proper waste disposal, the possibility of recycling and the harmfulness of inadequate waste disposal for human health and the environment. These activities should be organized on regular monthly bases.

Through the project "Protection of the natural environment of Polimlje from waste" use new technical possibilities for collecting floating waste from Reka in order to prevent its spread to the part of Lim that is in Serbia. Technical possibilities are the installation of two prefabricated-dismantling sprockets that would collect floating waste in places where a suitable truck for the collection of collected waste can access. The catering will be under video surveillance so that the operator from the center can control the safety of the sprockets and react in a timely manner if the waste accumulates.

Such technical potentials should be complemented by mobilization and promotional activities of the project:

– Organize public forums, discussion and opinion exchange in the area where the sprockets are placed

- Promote "eco-friendly" solutions regarding set sprockets
- Propose the direct participation of interested citizens, their associations and businesses in collecting floating waste and improving the ecological and socio-economic environment of the cross-border area.
- Improve number of bins, containers, for the primary separation of waste already on the doorstep - install special bins for glass, paper, food, etc. (be guided by the example of Milan in Italy).
- Close nonsanitary landfills in Serbia and Montenegro and build new sanitary landfills that comply with legal regulations (based on regional landfills of the Banjica type whose construction should be completed urgently with the subsequent closure of the Duboki Do landfill in Druglići).
- Plan construction of a recycling center as well as a regional waste management center (see the example of Slovenia).
- If the municipalities themselves do not have enough funds to build them, it is necessary to apply the principle of public private partnership or apply for funds from the donation of various foundations or EU funds.
- Build a dam around the abandoned Landfill of Stanjevina so that the Lim River does not take away waste every year during floods.
- In line with the recommendations from strategic documents, build a a sanitary regional landfill and a plant for wastewater treatment in Bijelo Polje
- Strengthen inspection supervision and introduce a harsh penal policy and fines for violators of provisions for those who dump waste by the river itself
- On the River Lim place a large number of floating cables or sprockets especially in the upper course of the river in order to collect waste with periodic cleaning of these cables. Take the waste to the recycling center or transfer station from where it will be carried out to the regional landfill for further treatment.
- Ensure that waste management system is constantly improved for well-being of all citizens of both municipalities.

These conclusions may be used as input elements for the development of project proposal and/or strategic documents that will be written during the fundamental training of the interested parties.

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