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**ENVIRONMENT IN CROSS-BORDER REGION
BETWEEN THE MUNICIPALITIES
OF KYUSTENDIL AND LEBANE**



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I INTRODUCTION

In the last few decades, there has been an increasing effort to raise the quality of life through the sustainable development of all social spheres. There is a need for integrated economic, technological, social, and cultural development in line with the need to protect and improve the environment. This type of concept promotes the rational exploitation of natural resources, where it is important to control the burden on the environment. Besides, it is necessary to change the style of production and consumption and to improve the environment with an integrated approach.

Environmental protection as an area of administrative activity was introduced in Serbia by the 1990 Constitution, through a provision concerning the human right to a healthy environment, and primarily through the enactment of the Environmental Protection Law in 1991. This was part of the huge success of the multi-year effort of the professional and general public, to establish a binding systemic approach within this area. One of the national priorities in achieving sustainable development in Serbia concerns the protection and improvement of the environment and the rational use of natural resources. This means integrating and harmonizing the objectives and measures of all sectoral policies, as well as harmonizing national regulations with EU legislation and fully implementing them.

In the past decades, institutions of international importance have increasingly emphasized the existence of regional and global environmental problems. Environmental problems have an international character, due to transboundary pollution or global change, and concern climate change or acid rain. Within the globalized economy, international agreements on environmental protection are becoming increasingly important. Based on that, through cooperation with the municipality of Kyustendil in Bulgaria, the municipality of Lebane has developed an eco-plan related to the protection and preservation of the environment, which includes the interspace of these two municipalities.

A planned approach to problem-solving, accompanied by the definition of goals that will enable the preservation of the quality of the environment, are considered necessary preconditions for the continuity of economic progress and the protection of the environment in a systematic way. With that in mind, a methodology related to the development of local environmental action plans has been developed. Such a methodology enables the planning of environmental protection, as well as its implementation, to be perceived in a new way. The



local environmental action plan has a role of a development-planning document which, starting from the assessment of the environment state, defined issues and priorities, and defined actions, is supposed to give its contribution in improving the state of the environment area, for which that plan is made in the first place.

Purpose and drafting reasons

The drafting of such a document is imposed as a necessity, having in mind the fact that the environmental issues have not been fully considered in the past period, as well as that the concept and priorities in their solution have not been determined. Numerous environmental issues arise as a consequence of the non-existence or low level of awareness of the individual regarding the understanding of how important it is to preserve the quality of the environment.

In order to contribute to the protection of the local environment, it is necessary to work on raising the environmental awareness of public opinion, which should have a greater role in the creation and implementation of strategic action plans and investments. This is explained by the fact that by mobilizing and directing civil activities towards the realization of jointly defined goals, concrete and measurable results can be achieved. The purpose and development of such an environmental plan can be defined by other reasons:

- contributing to the creation of the principles of cooperation and partnership between the two mentioned municipalities;
- improvement of inter-sectoral cooperation;
- formulation of the environmental policy of the two municipalities;
- expansion of knowledge related to environmental issues;
- definition of existing environmental issues and their causes;
- transparent criteria and analysis that help identify priority environmental protection goals.

Drafting goals

The eco-plan aims to describe the state of the environment of the region from the municipality of Lebane to the municipality of Kyustendil, as well as to present recommendations for the improvement and preservation of the environment in this region. The long-term goals are the introduction of systemic approaches through which the environment is improved, and they are



of great importance in initiating an integrated approach to protection, starting with precise analyzes of the state of the environment, which are obtained through monitoring. Through the launched environmental monitoring system, the accuracy of indicators can serve as an element of further strategic thinking in determining priorities within different environmental sectors.

Also, long-term goals improve the overall state of the environment from the municipality of Lebane to the municipality of Kyustendil by implementing concrete and economical environmental management strategies, and also strengthening local institutions regarding the management of environmental problems. There was a great need to draft this document, and it arose from the fact that environmental issues were not fully considered and were not implemented in terms of determining the concept and priorities for their solution. Other goals concern:

- understanding of environmental issues in the region;
- achieving public unity on how important and significant environmental issues are;
- meeting national requirements when drafting environmental plans;
- directing specific financial resources to the priority issues.

II GENERAL CONDITIONS

Considering the situation issues and environmental protection along the region from the municipality of Lebane to the municipality of Kyustendil was a great challenge. One such project represents a great potential for developing friendly relations between these two municipalities and between the Republic of Serbia and Bulgaria.

Geographical data

The municipality of Lebane, as a territorial unit, extends in the southern parts of the Republic of Serbia and is a part of the Jablanica administrative district. The center of this territorial unit is considered to be the town of Lebane. The results of the 2011 census show that 22,000 people live in the area of this municipality.



Figure 2.1. Geographical position of the municipality of Lebane

The municipality of Lebane borders on the north with the municipality of Bojnik, on the south with the municipality of Kosovska Kamenica, on the west with the municipality of Medveđa



and on the east with the town of Leskovac. This municipality includes the areas in the upper basin of Jablanica, as well as the areas that lie in the Leskovac valley. Traces of life in the area of today's municipality of Lebane date back to prehistoric times. Lebane as an urban settlement in the valley of the river Jablanica, next to the village of the same name, was founded in 1878. The development of Lebane as an urban settlement followed after it became the seat of the Jablanica district.

In the far west of the Republic of Bulgaria, on the border of Bulgaria, Serbia and Northern Macedonia, is the town of Kyustendil, the center of the Kyustendil region. Its strategic importance is reflected in the fact that it is some 20 kilometers away from the border with Serbia and Northern Macedonia, while it is about 90 kilometers away from the Bulgarian capital Sofia. In the Middle Ages, this city was called Velbužd. Today the city is called Kyustendil, in memory of Konstantin Dragaš, a Serbian medieval nobleman. The Ottoman Turks named the city, after Constantine, Constantine's Spa, that is, Köstendil. This name has been preserved until recently, though in a somewhat shattered variant, such as Kyustendil.

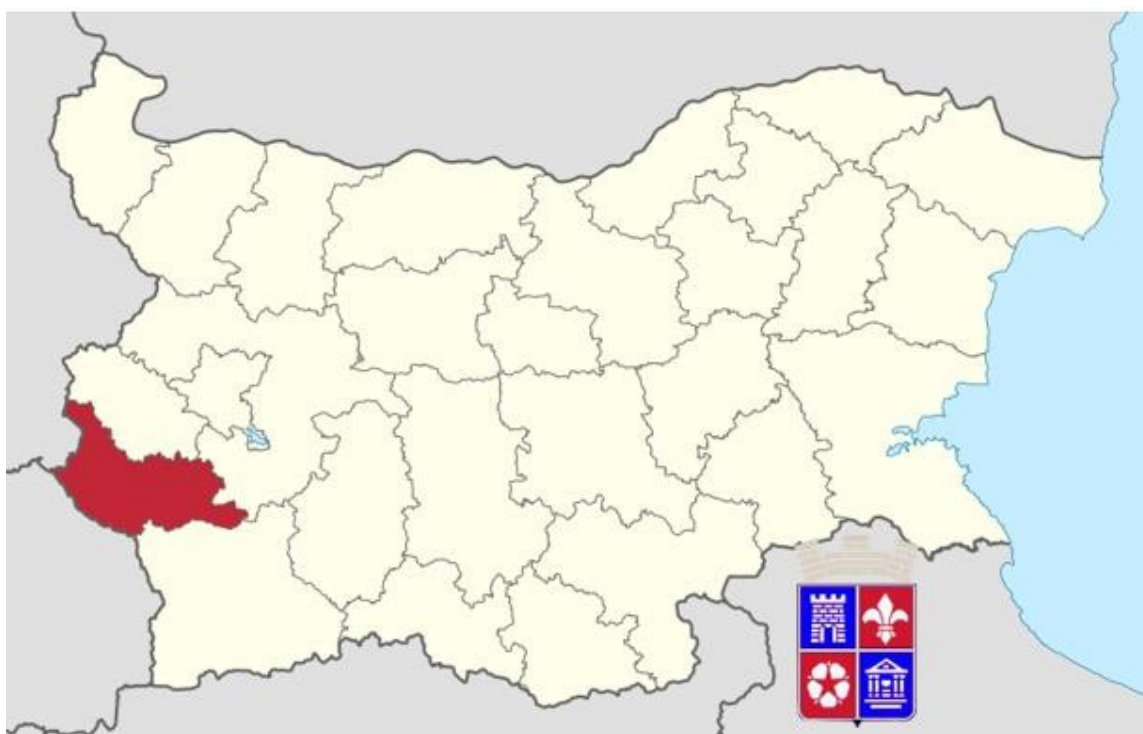


Figure 2.2. Geographical position of the municipality of Kyustendil

The distance between the municipality of Lebane and the municipality of Kyustendil by air is approximately 105 kilometers. The main road 40, which connects the A1 highway with southwestern Bulgaria from Lebane to Kyustendil, can be reached in about three hours, and the distance is about 200 kilometers.



Climatic characteristics of the area

The municipality of Lebane is characterized by a temperate continental climate, with moderately cold winters and hot and dry summers. The coldest month during the year is January with an average of -0.3°C , while the warmest month is July with an average of 20°C . The average annual temperature is 10.2°C . Due to low temperatures, the highest relative humidity is in the winter months, while in August it is the lowest. The average height of precipitation during the vegetation period is 349 mm. The winds mostly blow from the north, primarily during the winter months, while spring is characterized by a frequent and warm wind that blows from the south and which has a beneficial effect on the development of vegetation.

Table 2.1. Average temperatures and precipitation on the territory of the municipality of Kyustendil

	January	February	March	April	May	June	July	August	September	October	November	December
Average ($^{\circ}\text{C}$)	0.5	2.9	7.4	11.5	16.2	19.5	21.3	21.5	17.9	12.7	6.2	2.1
Minimal ($^{\circ}\text{C}$)	-3	-1.2	2.1	5.7	10.1	13.1	14.4	14.3	11	6.9	2.3	-1.2
Maximal ($^{\circ}\text{C}$)	4	7.1	12.7	17.3	22.3	25.9	28.3	28.7	24.9	18.6	10.2	5.4
Precipitation/rain (mm)	43	41	42	48	67	58	47	40	45	48	59	54

Kyustendil belongs to the area of temperate continental climate with Mediterranean influence. The average annual temperature is 12.5°C . The highest measured average temperature in a month was recorded in July (21.8°C), and the lowest in January (-0.8°C). Summers are usually long and warm, while winters are mild or slightly cold and last for a short time. Precipitation is moderate, with an average of 624 mm per year, while during the winter the snow cover lasts for an average of 30 to 40 days. Humidity is moderate and it ranges from 65 and 70%, while it is relatively low during the summer (especially in August).

Table 2.2. Average temperatures and precipitation on the territory of the municipality of Lebane

	January	February	March	April	May	June	July	August	September	October	November	December
Average ($^{\circ}\text{C}$)	0	2	7	13	18	22	23	23	19	14	8	1
Minimal ($^{\circ}\text{C}$)	-4	-3	2	6	10	13	15	15	11	7	2	-2
Maximal ($^{\circ}\text{C}$)	5	8	14	19	24	28	31	31	26	20	13	6
Precipitation/rain (mm)	48	45	42	52	68	65	54	36	38	59	62	55

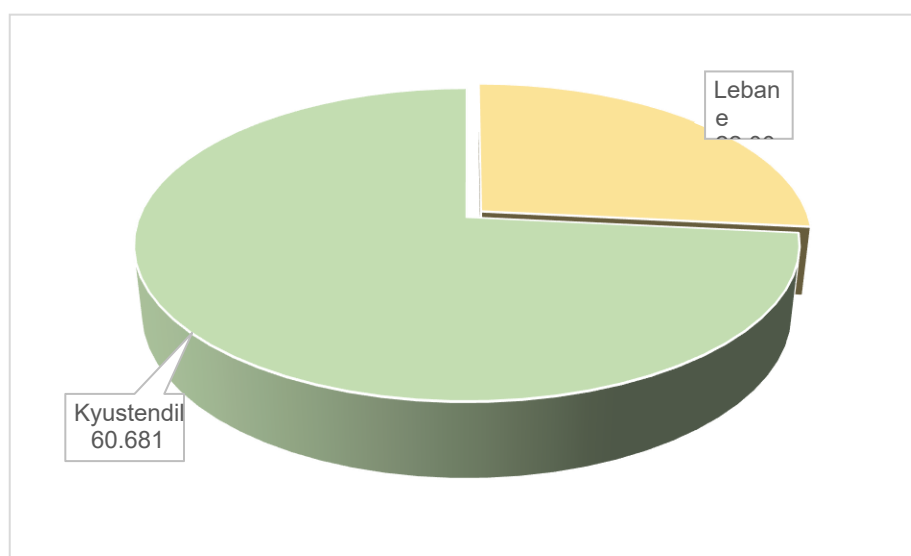
From the enclosed tables it can be concluded that the average annual climate of these two municipalities is very similar, given that they are very close to each other.



Demographic structure

Based on the 2011 census, the territory of the municipality of Lebane had 22,000 inhabitants. The municipality is mostly inhabited by Serbs, who make up 92.7% of the population, followed by Roma people, who make up 5.7% of the population.

When it comes to Kyustendil, based on the 2011 census, the city of Kyustendil had about 60,681 inhabitants, while the inhabited Kyustendil region currently has 160,700 inhabitants. Bulgarians make up the majority of the city's population, and the rest of the small population are Roma people. In the last 20 years, the number of inhabitants has decreased because the city is far from the main development trends in the country. The negative demographic trend can be stopped through economic recovery. The majority of the population is of the Orthodox religion.



Graph 2.1. Population of the municipalities of Lebane and Kyustendil

Basic economic indicators

Kyustendil is the center of light and processing industry, the most common is the wood industry, production of footwear, knitwear, ready-made clothes, toys, packaging, alcoholic beverages, bakery, printing, etc. The city owns companies that produce capacitors, power transformers, home and kitchen furniture. In the last few years, catering and tourism have been developing. There is a long tradition in this area in fruit growing and in the trade of fresh and dried fruits. This city and its surroundings are known as the "orchard of Bulgaria", because in this area there is a tradition that lasts for centuries in the field of fruit growing.



Figure 2.3. Bulgarian orchard – Kyustendil

When it comes to the current economy of the municipality of Lebane, the private sector produces about 88% of the national income, where agricultural activities dominate in their participation, and craft and small and medium enterprises participate far less. The services sector is made up of trade and service trades, and tourism activities are almost non-existent. The farms are mostly small. Although there is a large area under forests, forestry has not developed enough.

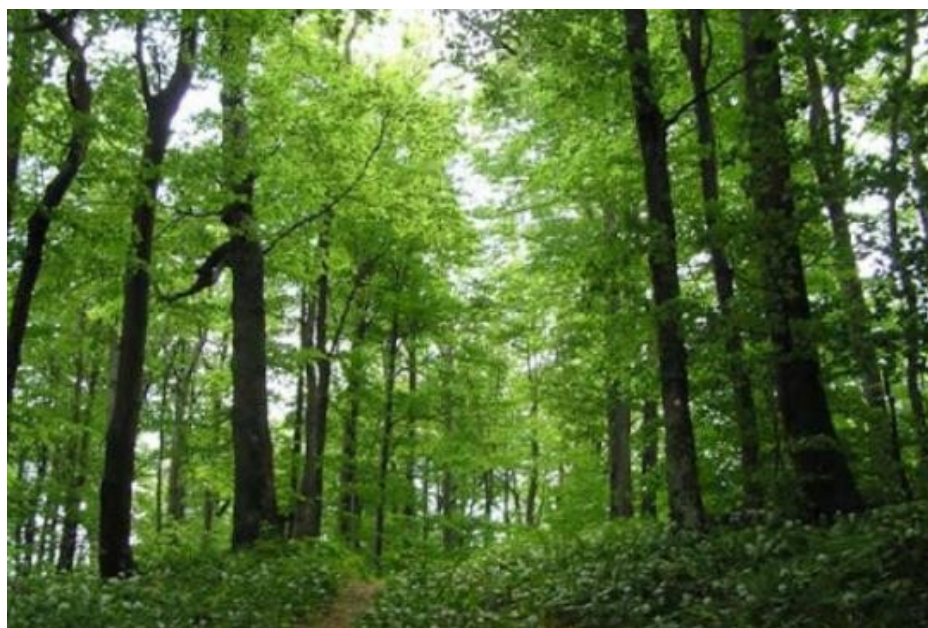


Figure 2.4. Lebane forestry



The municipality has a predominantly agrarian character due to agriculture and the fact that a large part of the area of Lebane is under arable agricultural land as well as under pastures. Within livestock production, cattle breeding (domestic colorful Simmental cattle, Simmental cattle and less Holstein) and pig breeding (crossbreeds of Landrace, Yorkshire and Piatren) are predominant in the hilly area, and sheep breeding (crossed Vitemberg, less Tsigai) in the hilly-mountainous area.

SWOT analysis

STRENGTHS

- Geo-traffic position of Lebane is favorable – state road I line, no. 9; proximity to the E-75 highway and the railway corridor; good accessibility to the regional center Leskovac.
- The network of state roads of I and II line is relatively developed and their interconnection is good.
- There are natural conditions and resources that are noticeable in the diversity of relief and land (agricultural, forest, water), favorable climatic conditions, quality agricultural land and the richness of the forest fund.
- Agricultural land is characterized by quality – the local population is traditional and dedicated to agricultural production.
- Lebane is characterized by an exceptional cultural and historical heritage that can contribute to the development of cultural and educational content in this municipality.
- There are existing events in the field of sport and culture.

OPPORTUNITIES

- More successful cross-border and regional cooperation in various industries, closer ties between the regions and European integration.
- Greater financial investments that would encourage the development of less developed areas.
- New strategic and planning documents that would refer to the region (Rural Development Strategy of Southern Serbia, Study of Eliminating Barriers to Investment, Study of attractiveness and advantages of the region for investments in certain productions, Project documentation for regional infrastructure projects, etc.)
- Implementation of adopted national programs and strategies related to management and development in various spheres of water management, environment and tourism.
- Stronger inter-municipal, inter-regional and cross-border cooperation in the field of protection of natural and cultural assets.

WEAKNESSES

- Extremely negative demographic tendencies – depopulation of a larger part of the municipality, negative natural increase, age structure of the population, migration and departure of people with work ability; poor qualification structure of the remaining people with work ability.
- Negative consequences of the transition and privatization processes – high unemployment and an increase in the number of poor households, an increase in the number of users of social protection services.
- Poor tourist offers accompanied by insufficient capacities, and lack of cooperation that prevents the creation of an integrated tourist offer in the wider area of the municipality Lebane.
- Lack of adequate and up-to-date planning documentation which would be used to direct the progress of certain parts of the municipality and put an end to uncontrolled and irrational land consumption.

THREATS

- Continuation of the bad demographic picture and departure of people with work ability to more developed places.
- Inability to market products, due to small local market.
- Insufficiently developed cross-border cooperation, as well as cooperation between municipalities and in the region in general, primarily insufficiently used potentials of water accumulation, etc. (tourism development, environmental protection, etc.).
- Domestic and foreign specific purpose funds not used properly due to the lack of planning and project documentation.
- Inadequate and inefficient organizational system of management, financing and monitoring of progress, protection and arrangement of space.
- Absence of investments and sustainable sources of financing, that is directing investments towards centers in the circumstances of further centralization of economic interests.



III ANALYSIS OF THE CURRENT STATE, IMPACT AND EFFECTS ON THE ENVIRONMENT AND RECOMMENDATIONS FOR ENVIRONMENTAL PROTECTION

Quality and environmental protection

Environmental protection represents a set of various procedures and measures whose task is to prevent endangerment of the environment, all with the aim of preserving the biological balance. Environmental protection is multidisciplinary and it is an eternal obligation of all society members. It is multidisciplinary in such way that it is related to the fact that health, environment and social conditions are seen as a complex of areas and issues that are mutually conditioned. Therefore, if there is any disturbance in the state of the environment, it is manifested through ecological and social disturbances, which are interrelated and conditioned.

Protecting the environment does not only mean protecting human health and human lives, but also preserving flora and fauna. The Universal Declaration of Human Rights with a new article reads: "Every human being has the right to maintain ecological balance in his environment, which he shares with all other living beings, animals and plants, whose survival as a guarantee of his own survival should be ensured."

These requirements are crucial for the survival of the living world and humanity. Therefore, in order to avoid ecological catastrophes and to shape an ecological ethics, certain human rights should be limited and delegitimized, above all "irresponsible" ownership, production and consumer powers that arise as a result of technological and political power being abused uncontrollably. Therefore, there is a need to define new human obligations that would contribute to the maintenance and development of natural living conditions, as well as the lives of people on earth.

The Municipal Council in Kyustendil adopted a Declaration according to which every inhabitant of the municipality has the right to live in an environment that is clean and healthy. The municipality is doing everything it can, among other things, initiating court proceedings to guarantee the principles of protection of the clean environment and survival of biological diversity, having in mind the characteristic goals of the municipal development plan for Kyustendil in the period from 2014 to 2020. The Municipal Council of Kyustendil sent an



invitation to all public, industrial, environmental and medical organizations to take part in the active implementation of such measures.

Geological research conducted in different parts of the territory of the municipality of Kyustendil has shown that there are heavy toxic metals in the area, such as mercury and arsenic, which are currently in natural balance and have no impact on water quality. This balance can be disturbed, water levels can increase, drinking water sources and irrigation sources can be polluted, if there is any intervention related to exploration wells or some other development. From the Podvirovi mine in the village of Karamanica in the Bosilegrad municipality and along the Dragovistica river, there is potential pollution, as well as problems with the Pčelina hydroelectric power plant, and they pose a risk of disrupting the ecological system in much of the Kyustendil region. The same problem with possible pollution is encountered towards the region of the municipality of Lebane.

Within the ecological categorization of the area of the municipality of Lebane, based on the degree of pollution and endangerment, three categories of environmental quality are represented:

- category - belt of traffic corridors, municipal center, construction areas of settlements, locations and complexes of production plants,
- category - forelands of watercourses;
- category - area of the municipality with natural landmarks - mountains Radan and Goljak, cultural heritage and protection zones of water supply sources.

Within the area of the municipality of Lebane, the dominant areas are nature, construction areas, settlements dispersed and anthropogenic ecosystems (agricultural areas). As far as production activities are concerned, there are textile and food production plants and disperse complexes and locations of service, craft and agricultural activities. These locations and complexes form zones and locations that are ecologically burdened at the same time, due to the production and management of waste, waste materials, wastewater. The degree of pollution does not have a homogeneous distribution, and it arose as a consequence of anthropogenic influences (infrastructure that is insufficiently equipped and communal arrangement).



Jurisdictions and obligations in environmental protection

The states of municipalities of Lebane and Kyustendil have enacted the Law on Environmental Protection (Law on Environmental Observations – promulgated DV No. 91/2002, amended DV No. 21 of March 13, 2020) and the Law on Environmental Protection – (“Official Gazette of RS”, no. 135/2004, 36/2009, 36/2009 – other law, 72/2009 – other law, 43/2011 – US decision, 14/2016, 76/2018, 95/2018 – other law and 95/2018 – other law) and on the basis of it, they come to the basic subject of the environmental protection system of the region from the municipality Lebane to the municipality Kyustendil, and they concern:

1. the Republic;
2. autonomous provinces;
3. municipality, that is city;
4. companies, other domestic and foreign legal entities and entrepreneurs who use natural values, endanger or pollute the environment (legal and natural persons) during the performance of economic and other activities;
5. scientific and professional organizations and other public services and
6. citizens, groups of citizens, their associations, professional or other organizations.

The key competencies of the municipalities of Lebane and Kyustendil, which are indirectly related to environmental protection, are that they, with their bodies and in accordance with legal regulations, regulate and ensure the performance and development of communal activities (water purification and distribution, purification and disposal of atmospheric and waste water, maintenance of cleanliness in cities and settlements, maintenance of landfills, arrangement, maintenance and use of parks and other green areas), as well as organizational, material and other conditions for their performance.

In relation to the insight into the current situation and obligations within the field of environmental protection, the municipalities of Lebane and Kyustendil have obligations related to:

- establishing environmental management in their territory;
- adopting local normative acts in the field of environment;
- establishing hierarchical cooperation of bodies, in accordance with competencies;
- developing and adopting a Local Register of Environmental Pollution Sources (based on the methodology for creating a local register of pollution sources and a methodology



for the type, manner and deadline for data collection), which is under the jurisdiction of the local self-government unit. This aims to monitor qualitative and quantitative changes in the environment and to undertake environmental protection measures;

- providing a report and available environmental information;
- that the person who carries the infrastructure of the project for which it is obligatory to assess the impact and the project for which the need for impact assessment has been determined, cannot have access to the implementation.

Recommendation for environmental protection

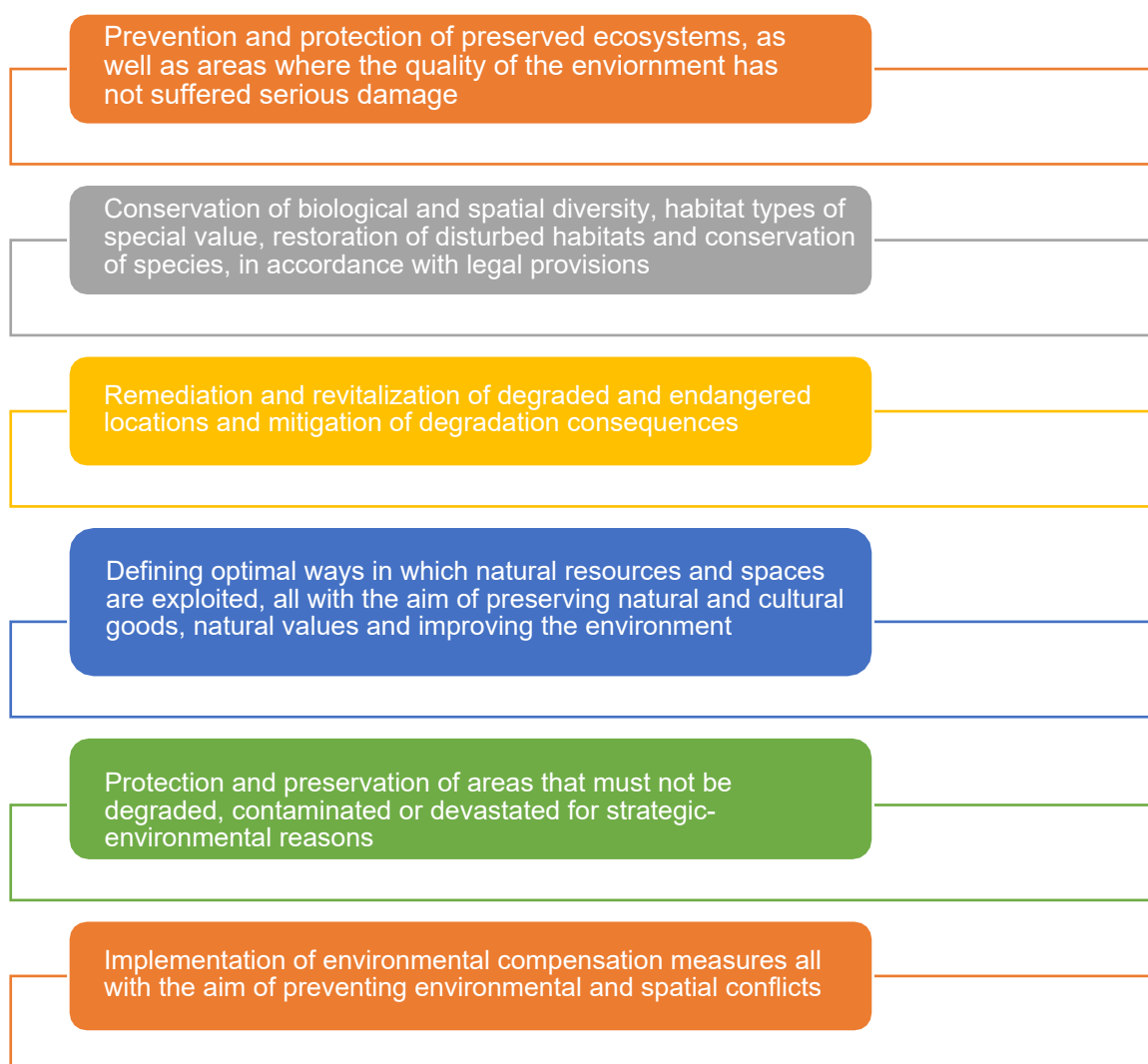
When it comes to the protection of the environment of the region from the municipality of Lebane to the municipality of Kyustendil, some general protection measures are taken, in the form of:

- building a system of environmental safety and effective protection within all activities;
- conservation of biological and landscape diversity, habitat types of special importance;
- restoration and development of disturbed habitats and protection of species, in accordance with the ecological network;
- use of space, which would be balanced, environmentally friendly and economically justified;
- planning the relations that would be most favorable in the relation of protected zones, as well as residential, production, recreational and communication zones;
- optimal exploitation of natural resources;
- preservation of high-quality and other agricultural, forest and water land;
- rationalities and controls in the exploitation of construction lands within construction areas and construction lands that are outside the boundaries of construction areas;
- rationality in the exploitation of natural resources, which mostly refers to water, raw materials for the production of construction materials and other mineral resources;
- waste management - with the aim of reducing the amount of waste, increasing the use of recycling, as well as safe disposal of all types of waste by applying the principles of regionalization;
- avoidance of ecological type conflicts in contact zones of habitation, recreation, economic and production activities, zones of exploitation of resources and roads;



- implementation of criteria and ways of preserving the environment from degradation and contamination when creating lower-level plans (strategic assessment of the impact of urban plans);
- implementation of criteria and ways of preserving the environment from degradation during the construction of facilities, potential sources of contamination and endangering the value of natural and cultural resources and the environment (assessment of how much the environment suffers from their impact).

Planning of the protective measures that the Lebanese and Kyustendil municipalities should apply, is based on basic ecological principles.



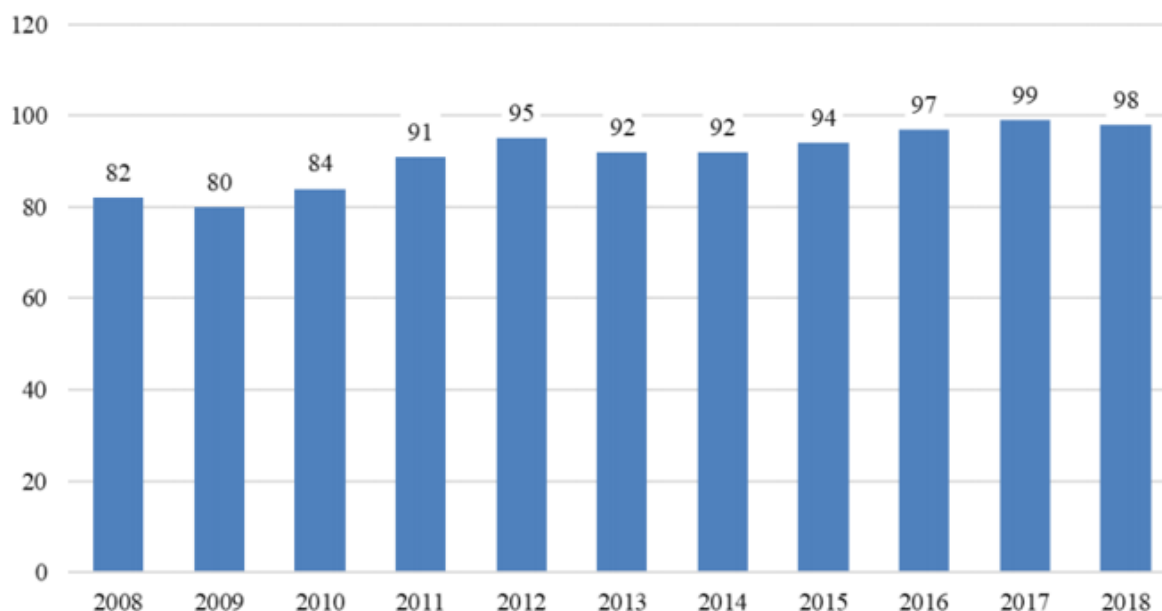
Scheme 3.1. Basic ecological principles of planning protective measures of the municipality of Lebane and municipality of Kyustendil



Water supply and water quality – analysis of the current situation and recommendations for conversation and improvement

State of water supply and water quality

During 2018, 99.4% of the population of the municipality of Kyustendil was connected to the public water supply. Drinking water used by the public water supply per capita in the district has been reduced from 99 l/day in 2017 to 98 l/day in 2018, as shown in Graph 3.1. For the same period of time, the average consumption of drinking water per person in the country was 99 l/day on a daily basis.



Graph 3.1. Drinking water for households using public water supply per person, municipality of Kyustendil

Problems related to water supply, as a consequence of dry periods, have been reported by 1% of the inhabitants of Kyustendil since 2015. In Bulgaria, 1.1% of the population had problems with water supply in 2018, with the districts of Gabrovo (28.2%), Trgovište (13.1%) and Sliven (7.8%) suffering the most damage. The number of inhabitants of Kyustendil who were connected to the city's wastewater treatment plants was 62.3% in 2018. In the area of the municipality of Kyustendil, a total of 220 water sources are being exploited, of which 1999 are underground and 21 surface sources.

As many settlements are directly supplied from water sources, whose water quality depends exclusively on natural conditions, it is necessary to build small plants that would treat wastewater. The water supply network of the municipality of Kyustendil has an external length of 607 km, while its internal length is 1,043 km.

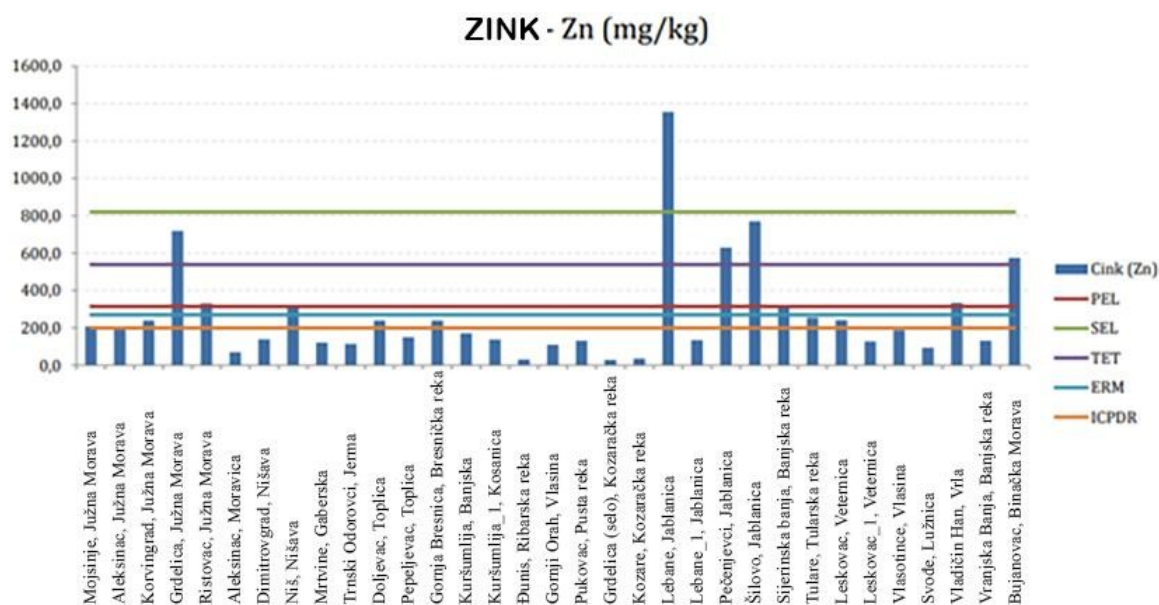


Water supply networks made more than four decades ago are constantly being renewed. In the area of the municipality of Kyustendil, only the town of Kyustendil and the village of Šiškovci have sewerage. The sewage system of the city is of a mixed type, about 12,000 km long and dating from around 1940. Wastewater is discharged in the City Wastewater Treatment Plant which started working in 1975. The project plant has a capacity of 560 l/s.

The construction of small wastewater treatment plants on the territory and other larger settlements is something that is considered necessary. The operation of the treatment plant takes place in the normal mode, without exceeding the individual limit emissions prescribed by law. On the other side of the border, the municipality of Lebane is supplied with drinking water by processing raw water that is captured from the living course of the Šumanka river from a location called "Ključ", which is located 18 km from Lebane. Water treatment takes place in PPV (Water Treatment Plant) "Grgurovce", where water is delivered by asbestos-cement pipes DN400 in the length of 6 km.

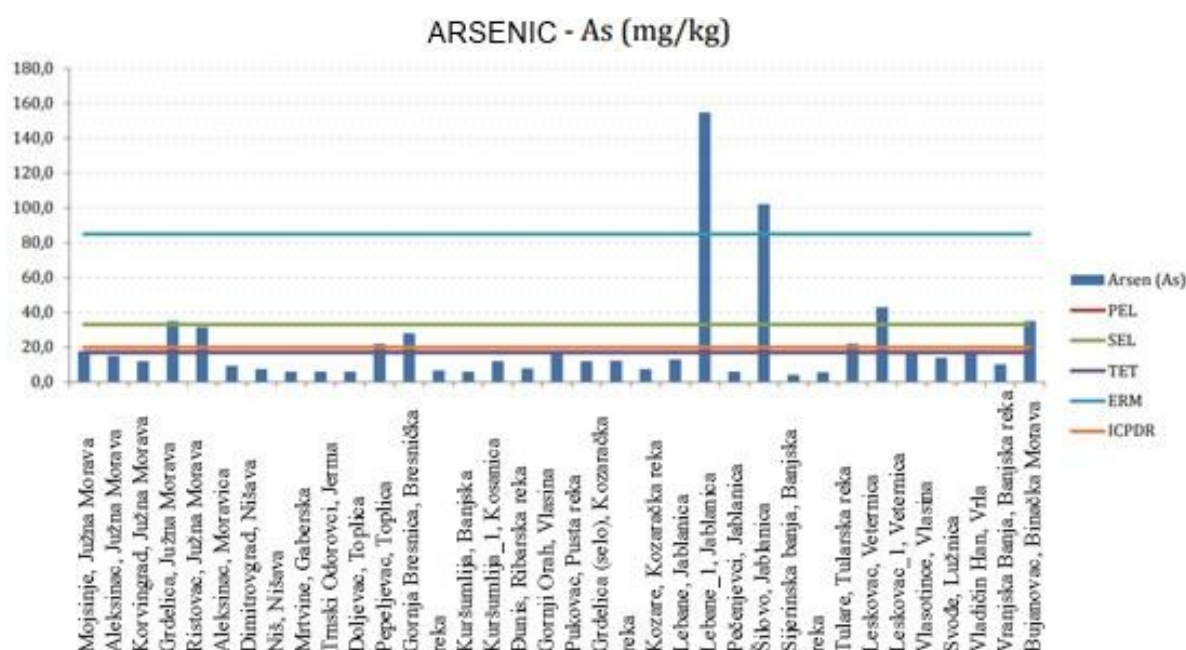
The complex technical-technological system enables the operation of the Water Treatment Plant, which works non-stop 24 hours a day, that is 365 days a year and produces close to 1,000,000 m³ of quality and healthy drinking water, which is delivered to the inhabitants of Lebane by main asbestos-cement pipeline DN200/250 which is 12 km long, and secondary pipeline directly to the consumer also through asbestos-cement pipes whose length is about 48 km. The sewerage system consists of collectors of various profiles, from DN400 to DN150. The length of this system is about 40 km and its role is to receive and drain water that has already been used. The main role of the sewerage system is the maintenance of the system.

Accelerated industrial and economic development of our country and the application of modern agro-technical procedures in agriculture, since the sixties of the last century, has led to degradation of watercourses and pollution of segments, because of the absence of water protection measures. When analyzing the results of sediment quality in this paper, one can unequivocally see the seriousness of this environmental problem in the Republic of Serbia. When assessing the quality of sediment, in relation to the zinc content, it can be seen that the measured concentration in the sediment of the river Jablanica (South Morava basin) on the Lebane profile (1356.0mg/kg) exceeds the defined limit values for SEL (Zn) = 820mg/kg and TET (Zn) = 540mg/kg, which implies that there is a level of serious and toxic effects on aquatic life.



Graph 3.2. Zinc content in river sediment in the South Morava basin in relation to quality criteria

When assessing the quality of sediment, in relation to the arsenic content, it can be seen that the measured concentrations in the sediment of the river Jablanica on the profiles Lebane_1 (154.8mg/kg) and Šilovo (102.2mg/kg) exceeded the shown limit values for PEL (As) = 17mg/kg, ERM (As) = 85mg/kg, SEL (As) = 33mg/kg and TET (As) = 17mg/kg, indicating the level of probable, moderate, serious and toxic effects on aquatic life.



Graph 3.3. Arsenic content in river sediment in the South Morava basin in relation to quality criteria



Recommendations for improving the situation in the field of water supply and water quality

In relation to the legal regulations, along the region from the municipality of Lebane to the municipality of Kyustendil, there is an obligation to create certain conditions for all water resources (groundwater and surface water, as well as thermal and mineral waters), as follows:

- establishment of integrated management of waters, water facilities and water land,
- ensuring good ecological status of surface waters, quality of structure and functioning of aquatic surface water ecosystems,
- prevention of direct and indirect pollution (introduction of substances or heat into air, water or soil that may be harmful to human health, quality of aquatic ecosystems, coastal ecosystems, which cause damage to material goods, reduce/interfere with normal and other legitimate uses of the environment),
- providing minimum sustainable flows downstream of water intakes that are important for the survival and development of downstream biocoenosis and meeting the needs of downstream users,
- prevention of deterioration,
- providing protection, improvement and renewal of all surface waters in order to achieve good status of surface and groundwater.

Surface and ground water along the region from the municipality of Lebane to the municipality of Kyustendil are protected for the purposes of environmental protection, that is:

- to preserve human life and health,
- to reduce pollution and to prevent further deterioration of water status,
- to ensure the harmless and unhindered use of water for various purposes,
- to protect aquatic and coastal ecosystems in order to achieve environmental quality standards.

Protection and improvement of surface and groundwater quality is based on activities and measures by which the quality of surface and groundwater is protected and improved, through prohibition measures, prevention, mandatory measures of protection, control and monitoring measures.



There are general guidelines and measures for water protection, control and monitoring in the area of the region from the municipality of Lebane to the municipality of Kyustendil, and they deal with:

- preventing further pollution of the Jablanica and Šumanska rivers and raising the water quality in the rivers to the required level;
- preventing further pollution of the Dragovistica rivers and raising the water quality in the rivers to the required level;
- building a central plant that will treat wastewater from the city center and supporting infrastructures;
- providing all residents of the region with an uninterrupted water supply of quality drinking water;
- potential floods of torrential nature of protection should be done with active measures that could mitigate flood waves;
- zones and locations for which planning documentation will not be prepared, when issuing a location permit, it is necessary to provide mandatory wastewater sewerage measures, as well as construction of a watertight septic tank of capacity and dimensions in relation to water consumption and authoritative vehicle for wastewater evacuation (device for wastewater treatment);
- regulating the watercourse in the settlement zone, on the basis of functional criteria, and on the basis of urban, aesthetic and other conditions that improve the environment.

Prohibition measures in order to preserve and protect water quality:

- prohibition of letting in (importation) of all types of wastewater that have harmful and polluting substances that are higher than the prescribed emission limit values, and which can worsen the current state of all surface waters;
- prohibition of discharge (letting in) of all waste into standing water, if that water has made contact with groundwater, which may jeopardize the good ecological or chemical status of standing water;
- prohibition of discharges (letting in) from the shores or riverbank of any contaminating substances that can directly or indirectly enter the water of all watercourses;
- prohibition on discharging too much thermally contaminated water from appliances, plants, technologies and facilities;



- prohibition of the use of fertilizers or plant protection products in the coastal part up to 5 meters wide of all watercourses;
- prohibition of discharge into the public (settlement) sewerage system of any wastewater that contains harmful substances in excess of the prescribed values, which may have a detrimental effect on the possible treatment of sewage water, which may damage the sewerage system and water treatment plant, and which may adversely affect the health status of persons in charge of maintaining the sewerage system;
- prohibition on the use of unattended wells as septic tanks;
- prohibition of disposal, spillage and leaving of all types of materials with which water can be polluted in foreland zones and in riverbeds for a large amount of water from natural and artificial watercourses and lakes;
- prohibition of washing vehicles, machinery, equipment and appliances in surface waters and on water land.

Air quality – analysis of the existing condition and recommendations for preservation

Air quality condition

Air quality management in the municipality Lebane, monitoring and implementation of protection and improvement of air quality includes:

- achieving limit values of levels of contaminants in the air;
- assessment of upper and lower limit levels of airborne contaminants;
- defining the limit level of tolerance and tolerance values;
- informing the public about concentrations that may have dangerous consequences for human health;
- defining the critical levels of contaminants in the air;
- defining what are the target values and long-term goals that will reduce contaminants in the air.

According to the Law on Air Protection ("Official Gazette of RS", No. 36/09 and 10/13), the Environmental Protection Agency has the obligation to prepare and publish an Annual Report on the state of air quality in the Republic of Serbia. Respecting the Law on Air Protection, a state network was established whose obligation is to measure air quality within settlements, industrial and uninhabited areas, in areas where there is a great impact of traffic, within

protected natural assets, as well as to measure transboundary atmospheric transmission of air pollutants (international program EMEP - Cooperative program for monitoring and evaluation of long-range transmission of air pollutants in Europe). There is no measuring station for the condition and quality of air in Lebane, but the data are obtained from the measuring station located in Niš, as the station closest to the municipality of Lebane. Figure 3.1 shows the data from the measuring station Niš in the previous month.

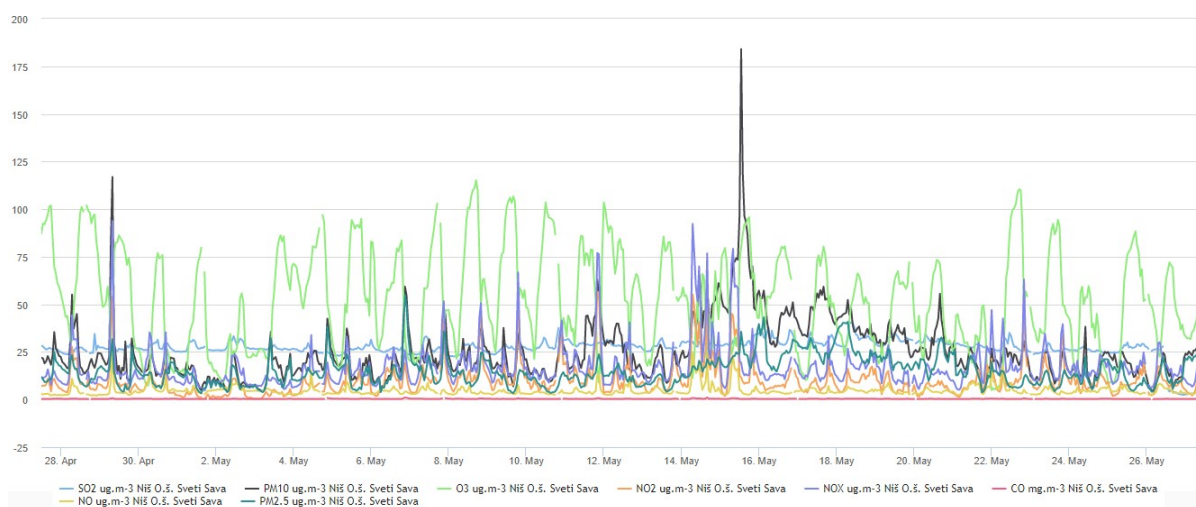


Figure 3.1. Air pollution Lebane

The municipality of Kyustendil falls under the southwestern area of air quality assessment and management in Bulgaria. Measurements performed in Kyustendil showed an excess in the concentration of fine particles, which led to the adoption of regulations on the creation of programs to reduce the level of air pollutants, respecting the requirements of Article 37 of Regulation no. 12 on standards for sulfur dioxide, nitrogen dioxide, fine particles, lead, benzene, carbon monoxide and ozone. This phenomenon is primarily a consequence of the use of solid heating fuels, as well as road traffic. The quality of the atmospheric air of the municipality of Kyustendil is greatly influenced by its relief, because it makes it impossible for pollutants from the ground layer to dissipate quickly. The increase in the levels of nitrogen oxides and lead aerosols also occurs as a consequence of motor traffic.

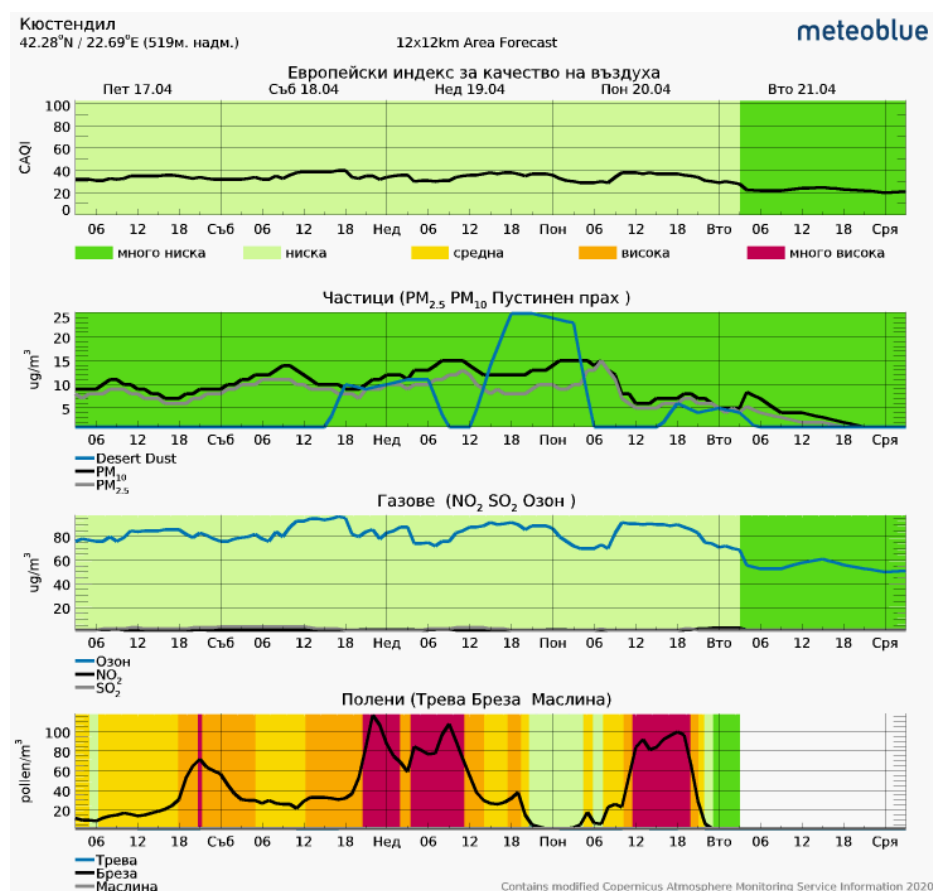


Figure 3.2. Air pollution Kyustendil

Recommendations for improving the air quality condition

In order to manage the air quality in a more efficient way, zones and agglomerations are determined in the areas of the Lebane and Kyustendil municipalities according to the assessment of the air quality. A unique system is being established that monitors and controls the level of air pollution and a database with data related to air quality is maintained. Jurisdictions in the creation of state and local networks, conditions for monitoring, as well as the duty of the competent authorities to submit all important data related to air quality to the Environmental Protection Agency and to make them known to the public are defined in detail.

Basic instructions and control measures, protective measures and air monitoring measures are:

- less emission of air pollutants and concentration of substances that have a harmful effect;
- reconstruction of city roads that would lead to the relevant traffic load;
- better regulation of traffic flow on city roads;
- the level of communal hygiene is raised;



- choices of energy sources that are environmentally friendly, as well as energy sources that are renewable are favored, and energy efficiency is introduced;
- a system is being developed in which the energy supply is centralized;
- city and other roads of all ranks are landscaped on both sides (or unilaterally) and all areas with traffic function are landscaped (parking, plateaus, etc.);
- the existing and new green areas of all categories are reconstructed and planned, in relation to the spatial, location conditions and rank in the network of settlements;
- further introduction of EOP technologies (technologies for the treatment of pollution at the end of production processes) into the production process is prevented and the introduction of clean technologies is encouraged;
- air quality monitoring is defined, in relation to the established Program, the Law on Air Protection, with constant review of the need to expand the monitoring network of measuring points where air quality will be monitored;
- spaces, units and zones (existing and planned) are planned and urbanized, in relation to the conditions for assessing the impact of the strategic nature of the plans on the environment;
- the existing planned projects (facilities, technologies, infrastructures) of potential air pollutants are reconstructed and built, and this is possible with the obligatory application of the environmental impact assessment procedure;
- monitoring of the impact of air pollution on the health of the population is mandatory;
- availability of the results of testing and monitoring the state of air quality is mandatory, and it is necessary that the public and competent institutions are regularly informed, in accordance with the Law;
- constant education and raising environmental awareness of the importance of air and environmental quality;
- production and other existing plants, as well as planned, which are considered as sources of air pollution, have an obligation to apply the best available techniques and technologies, which will aim to prevent and reduce emissions of harmful and dangerous substances into the environment.

The obligation of every carrier of air pollution is:

- to submit to the competent authorities, data on stationary sources of pollution and any changes thereof;
- to ensure regular monitoring of emissions and to record them regularly;

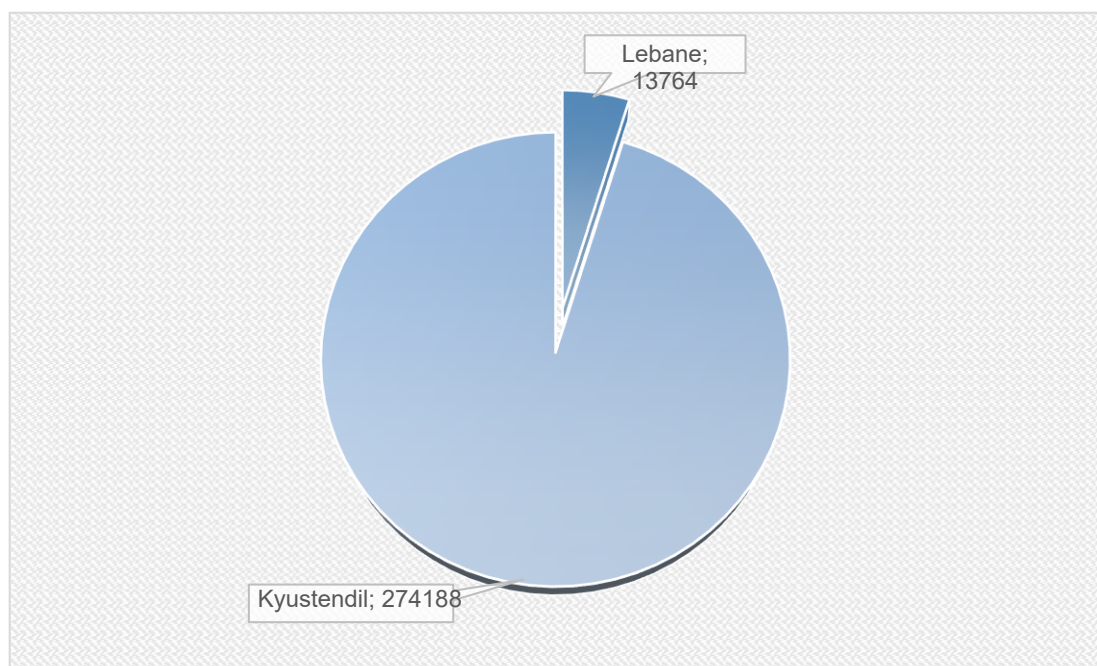


- to provide continuous emission measurements if there is an obligation to do so (when the mass emission flow for a certain pollutant is higher than the prescribed values) independently, using automatic devices for continuous measurement;
- to keep records of continuous measurements performed with data on measuring points, results and frequency of measurements, to submit data once every three months and to submit measurements on an annual basis in the form of an annual report;
- to provide emission control measurements with the help of authorized organizations, if the emission measurement is performed independently;
- to provide periodic emission measurements that are prescribed, through an authorized (accredited) legal entity twice a year if continuous monitoring is not performed;
- to submit the data to the competent authority;
- to keep records on the type and quality of raw materials, fuels and waste within the incineration process;
- to keep records of the operation of devices that prevent or reduce the emission of pollutants as devices used to measure emissions.

Land – analysis of the current situation and recommendations for conservation

Analysis of the current situation

Although degraded by pollution and destructive processes, the land located on the territory of the municipality of Lebane has not been examined, as well as the saturation of the land with heavy metals and pesticides. The soil can be degraded by erosion, as well as thanks to the created landfills and the disposal of substrates of mineral and organic origin. If fertilizers and pesticides are applied excessively and inadequately, and if there is no adequate quality control of water used in irrigation in agriculture, the possibility of land becoming polluted greatly increases. In general, various chemicals pollute the soil, surface and groundwater. The results presented in the municipal questionnaires show that the quality of the land is generally satisfactory because there are no traces of heavy metals and pesticides in it. At the annual level, about 2% of the land is lost from its basic purpose (agricultural is translated into residential, industrial and infrastructure). Although this percentage is not large, there is a big problem of uncontrolled conversion and illegal construction, and the actualization of them takes place mainly on agricultural land.



Graph 3.4. Ratio of arable land of municipalities Lebane and Kyustendil (in hectares)

Exceeding the maximum allowed concentrations (MAC) in the area of southeastern Serbia was confirmed in the case of 7 chemical elements, namely: arsenic, cadmium, chromium, nickel, lead, zinc and fluorine. When it comes to the total number of samples analyzed in the study area, fluorine (F) exceeded the MAC in 63.33% of samples. The macro-project "Fertility control and determination of the content of dangerous and harmful substances in the lands of the Republic of Serbia" in the area of central Serbia is financed by the Ministry of Agriculture and Environmental Protection, and implemented by the Land Institute from Belgrade. The research covered 15 municipalities: Preševo, Trgovište, Bosilegrad, Vranje, Surdulica, Vladičin Han, Bujanovac, Crna Trava, Lebane, Vlasotince, Babušnica, Medveđa, Leskovac, Kuršumlija and Dimitrovgrad.

In this municipality, the best developed branch of agriculture is truck farming. In the plains, the population is engaged in agriculture, while in the hilly and mountainous areas, fruit-growing and livestock are present. Lebane covers an area of 337 square kilometers, of which agricultural land occupies 13,764 hectares, that is 63.2% of the land, and forests 31.7% of the total territory.

The borders of the municipality of Kyustendil, on the other hand, are agricultural land, which is the main resource for agricultural development, and its main subsector is field production. The land on the territory of the municipality of Kyustendil amounts to 456,454 hectares, which



is 47.6% of the total territory of the municipality. Arable land is 274,188 hectares or 60.1%. According to the state agrostistics in the municipality, there are 3,178 agricultural farms.

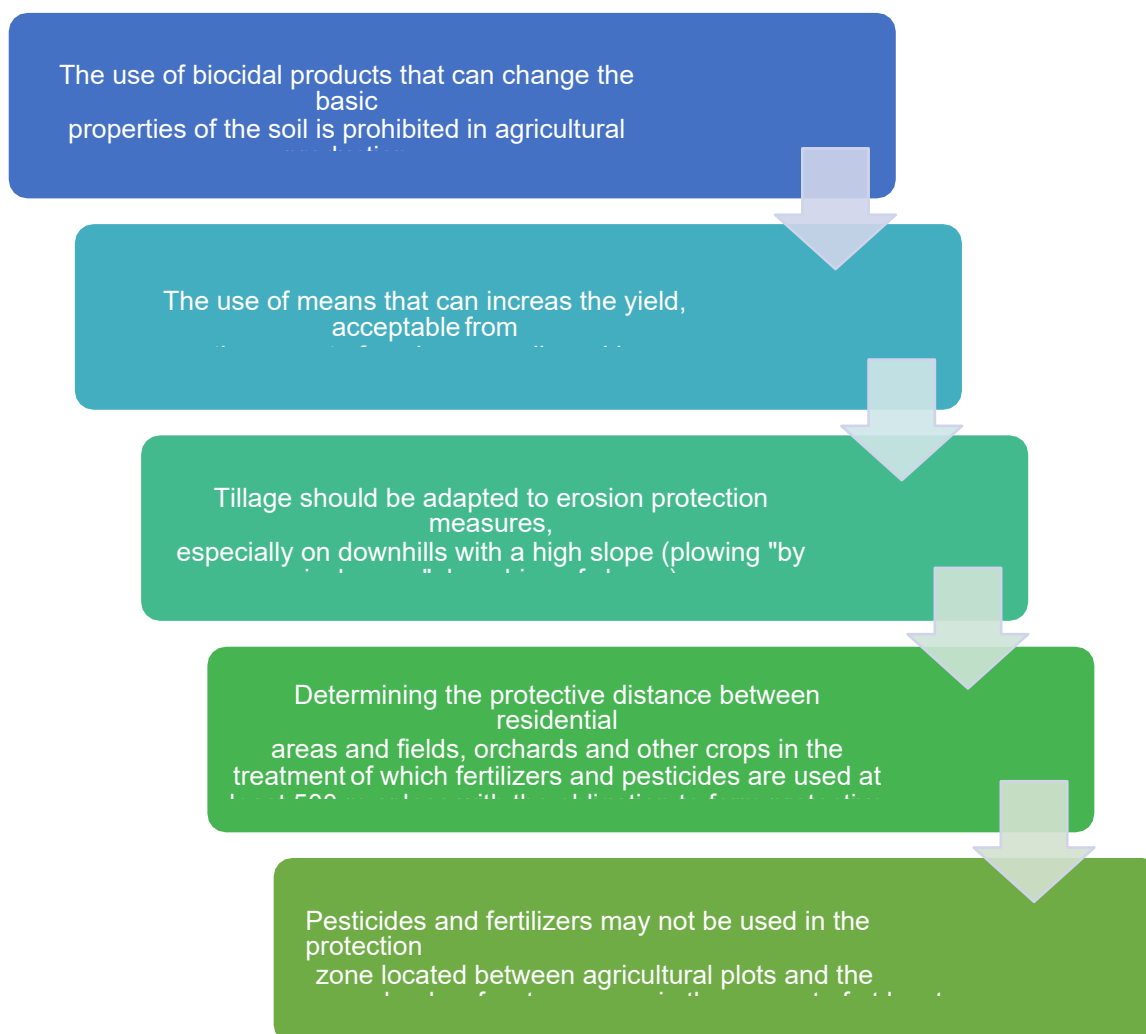
Recommendations for improving the situation in the field of land quality

The protection system of the land area and its sustainability are implemented through the measures of systematic monitoring of the quality of the land, which consists of:

- monitoring of land degradation risk assessment indicators;
- implementation of remediation programs that would eliminate the consequences of contamination and degradation of the land area, whether natural or caused by human factors.

The basic measures for protection of land from contamination consist of the following:

- Establishment of a system that would constantly check the condition, quality and the extent to which the land is fertile within the zones in which agricultural production is intensive;
- Enactment and adoption of a Program that would control the quality of agricultural land;
- Controlling the process of technology, reduced emissions of waste materials and waste management of all kinds;
- Prohibition of locating and implementing new projects of possible soil and air pollutants not far from agricultural lands that have a high degree of fertility;
- Protection and survival of fertile agricultural lands which are an important resource in food production, and which are difficult to renew;
- Regulation of river flows and implementation of measures that protect against floods and torrents;
- When irrigating, use water that meets the standards of water use in agricultural and food production;
- Enactment and adoption of the Program which contains measures of constant recovery and prevention in terms of maintaining the quality of land (recovery, remediation and reclamation of landfills, degraded areas, equipping settlements in terms of infrastructure and utilities);
- Enactment and adoption of the Program of constant learning and promotion of how to properly apply agro-technical measures in the field of agriculture.



Scheme 3.2. Environmental protection measures against agricultural impacts

Waste management – analysis of the current situation and recommendations

Analysis of the current situation

Municipal, construction, industrial and hazardous waste is generated in the municipality of Kyustendil. Based on the analysis, it can be seen that the types and quantity of waste are in line with the general tendencies in the country. The results of the analysis show that the largest percentage of waste is on food waste - 46.6%, on paper - 6.56%; polymers make up - 6.18%; of glass - 6.14%, etc. As separate collection began to be applied, a good portion of the recyclable waste stream components are collected and disposed of for recycling and reuse. First of all, glass, paper, plastic and metal are separated.

The quantity of construction waste that is disposed of somewhere is usually determined on the basis of data recorded in the mayor's permits for waste transportation. In order for the activities

that can lead to the improvement of the environment to be implemented, unsustainable masses of land and small construction waste are disposed of at the landfill near the village of Radlovci. Larger quantities of construction waste are illegally dumped along roads, primarily at the entrance to the city and at the exit from the city.



Figure 3.3. Landfill near the village of Radlovci

In the municipality of Lebane, waste management is carried out on the basis of prescribed measures related to waste management, in the phases when it is collected, transported, stored, treated and disposed of, together with the supervision of all these activities and care for the waste management facilities after closure. High expenditures, irrational organization, poor quality of services and insufficient care for the environment are the result of a very poor situation in the organization of waste management.



Figure 3.4. Project “Ecological” of the municipality of Lebane in cooperation with the Ministry of Agriculture and Environmental Protection of the Republic of Serbia and the municipality of Lebane

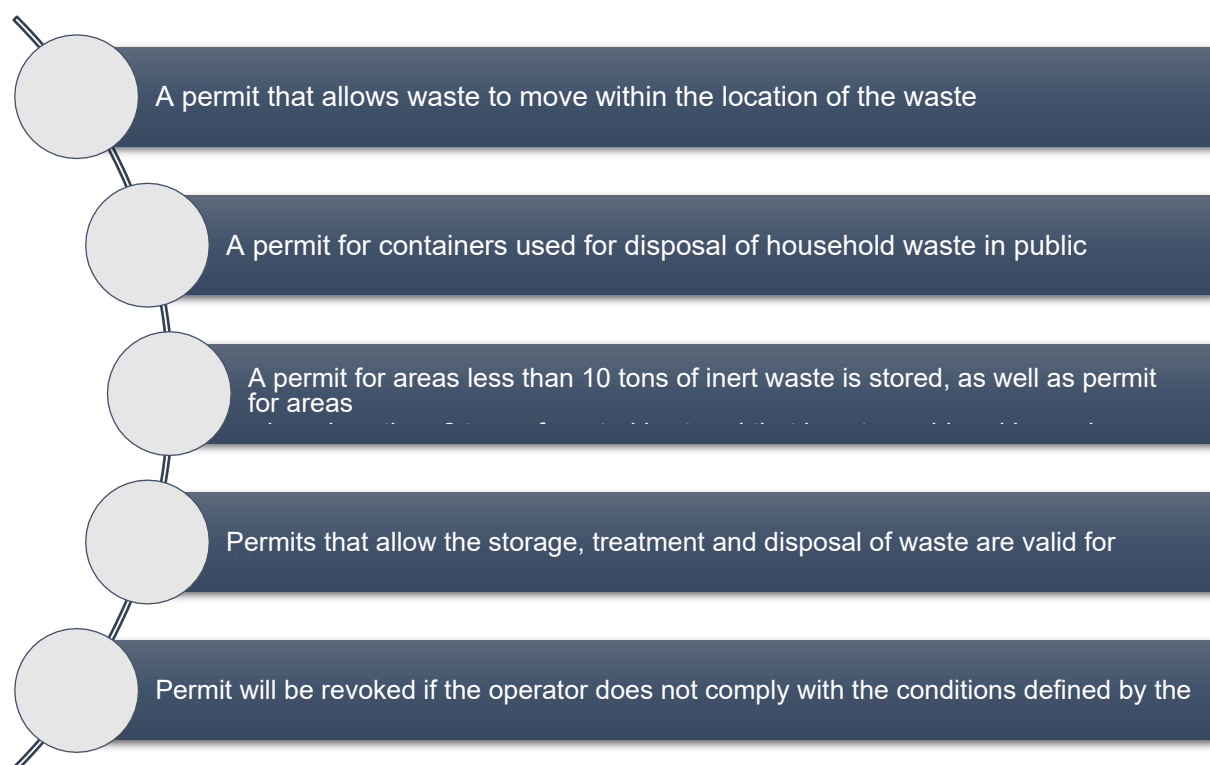
The public sees waste and its treatment as a problem. However, the public does not feel that this is its problem, but someone else's and whose solution is within the competence of others - the state, local self-government, industry, etc. In general, it shows willingness to take part in solving that problem, only if it itself feels threatened or if there is an interest for the public to solve that problem. The area of the Lebane municipality is classified as an area with a quality environment, and it is directed towards regional centers that manage waste - municipal waste in Leskovac and the central regional warehouse for hazardous waste in Niš. The landfill, which was located at the entrance to the settlement of Lebane on the right bank of the river Jablanica, was rehabilitated, while a plan was made to rehabilitate the landfill in Konjin, and both of those landfills are no longer in function. The central ecological landfill in Leskovac is a place where communal and industrial waste is brought from the territory of the municipality of Lebane.

Guidelines and recommendations for improvement

Guidelines to improve waste management for the region between the municipalities of Lebane and Kyustendil:



- for waste management facilities that receive an integrated permit or a permit that allows them to manage waste, the preparation and adoption of a work plan for waste management is performed;
- it is the obligation of the producer or importer whose product grows into hazardous waste after use, to take over such waste after use and to treat it in compliance with this law and other regulations, whereby this work would not be reimbursed;
- the manufacturer or importer of products that, after use, grows into hazardous waste, has the possibility to authorize another legal entity to take over the product after its use, on its behalf and for its needs;
- waste characterization is applied only in the case of hazardous waste and waste that, based on its origin, composition and characteristics, can be treated as hazardous, except for household waste;
- all waste management expenses are borne by its owner;
- ownership of the waste is terminated as soon as the future owner takes over the waste and receives the Waste Movement Document;
- all costs related to waste disposal shall be borne by the holder (owner) who directly hands over the waste to the waste collector or waste management facility and/or at the expense of the previous holder (owner) or producer of the product from which the waste originated;
- those responsibilities and obligations that the owner of the waste has are also held by the person who takes part in the trade of waste in the capacity of an indirect holder of the waste, where he is not really the owner of the waste;
- costs related to the collection, transport, storage, treatment and disposal of waste shall be borne by the producer or owner of the waste, in compliance with the law;
- waste is transported in a closed vehicle, container or other appropriate manner in order to prevent it from spilling or falling out during transport, loading or unloading in order to prevent water, air, soil or the environment from being contaminated;
- waste is transported on the basis of a permit for waste transportation and requirements that define separate transport regulations (ADR/RID/ADN, etc.);
- waste that is considered hazardous must not be stored at a location belonging to the producer or owner of the waste for a period longer than one year, unless otherwise defined by this law;
- it is not allowed to dispose of and incinerate waste that can be reused.



Scheme 3.3. Permits for performing one or more activities in the field of waste management

When managing packaging waste, the following recommendations were issued:

- manufacturers, importers, packers/fillers and suppliers have an obligation to provide space where packaging waste will be picked up, collected, sorted and temporarily stored if the total annual amount of packaging waste is (glass, paper, cardboard and multilayer packaging with mostly paper cardboard component, metal, plastic, wood, other packaging materials) greater than 100 t;
- the criteria for determining the packaging, the criteria and the list concerning the standards and basic requirements that the packaging must meet should be respected;
- the criterion that will determine the packaging with a long shelf life should be respected;
- it is obligatory to respect the systems through which packaging materials are identified and marked, and these systems are based on numeration (numbering) and the use of letter abbreviations for all packaging materials (plastic, paper and cardboard, metal, wood materials, textile materials, glass and multilayer materials);
- the total level of controlled metals in the material from which the packaging or its parts are made should be respected, and it must not exceed 100 ppm by weight, that is 100 mg per kilogram of the weight of the packaging material or its parts (except for packaging made up entirely of lead crystal glass, glass packaging, plastic boxes and pallets derived from recycled material);



- the operator is obliged to obtain a permit to manage packaging waste;
- the obligations of the system operator, manufacturer, importer, packer/filler, supplier and end user are to submit a report regarding the management of packaging waste;
- manufacturers and importers of packaging have a duty to issue during the placing on the market or use of packaging, that is to provide a declaration stating that the packaging complies with the requirements for placing on the market.

Ionizing and non-ionizing radiation – analysis of the current situation and recommendations

Analysis of the state

Non-ionizing radiation is any type of electromagnetic radiation that does not have enough energy per quantum (at the photon level it is less than 12.4 eV), by which it could cause ionization; that is, an electron removed from an atom or molecule. Instead of creating ions during the passage through matter, electromagnetic radiation has energy only for excitation, that is for the transition of electrons to a higher energy state, where different biological effects are observed in different types of non-ionizing radiation. Non-ionizing (EM) radiation includes: ultraviolet radiation, visible radiation (light-wavelength 400-780 nm), infrared radiation, radio frequency radiation, low frequency electromagnetic fields (0-10 kHz) and laser radiation. Non-ionizing radiation also includes ultrasound or sound with a frequency higher than 20 kHz. Sources of non-ionizing radiation can be devices, installations or objects that emit or can emit non-ionizing radiation.

There is a fear of the impact that non-ionizing radiation has on health, and it is primarily based on numerous epidemiological studies. These studies increasingly link diseases and certain environmental characteristics, based on biological data in certain (observed) time periods for a large number of people. All biological data are purely statistical; however, people can generally fit into certain categories based on place of residence or work.

Ionizing radiation from natural sources originates from cosmic radiation (cosmic rays), radionuclides from space, radionuclides from terrestrial sources. Spontaneous nuclear transformation produces Alpha radiation, Beta radiation (corpuscular in nature) and Gamma radiation (photonic in nature). Effects on living organisms can be manifested externally and internally. During the evolution that the living world has gone through, natural ionizing



radiation has always had its effects, and the biological mechanisms of the organism have adapted.

Artificial sources of ionizing radiation fall into several groups: nuclear explosions; nuclear energy; medical resources; and other sources. As we have managed to produce ionizing radiation, we must also know what our responsibility is, not only when it comes to the human population, but also the entire living world and the responsibility for our planet. In order to master the energy force of ionizing radiation, it is necessary to have a massive amount of information and conduct constant education of the population in order to take into account the useful purposes but also extremely severe consequences of using ionizing radiation in accidental (ignorance) or intentional misuse of this energy. It is essential for the preservation of the environment and the living world to measure the level of contamination with radionuclides in the environment, as well as the application of preventive measures in compliance with the law.

The provisions of the legal regulations of the Republic of Serbia and the Republic of Bulgaria on ionizing radiation and on nuclear safety have the highest standards prescribed by the world's leading organizations in this field, such as:

1. International Atomic Energy Agency (IAEA),
2. Nuclear Energy Agency - organizations for economic cooperation and development (ANE-OECD),
3. International Commission on Ionizing Radiation Protection (ICRP),
4. World Health Organization (WHO),
5. International Labor Organization (ILO),
6. Food and Agriculture Organization of the United Nations (FAO).

The legislation of the Republic of Serbia and the Republic of Bulgaria on ionizing radiation and nuclear safety prescribed:

1. to introduce new, higher standards in the implementation of protection measures against ionizing radiation, nuclear and radiation safety,
2. to establish more complex regulations but to enable more efficient application of laws,
3. to establish strict and comprehensive supervision over sources emitting ionizing radiation and over nuclear facilities, radiation activities and nuclear activities, as well as over the management of radioactive waste.



Protection against non-ionizing radiation in the legal regulations of the Republic of Serbia and the Republic of Bulgaria contain the following principles:

1. principle of prohibition - no exposure to non-ionizing radiation is allowed above the prescribed limit and unnecessary exposure to non-ionizing radiation is not allowed;
2. proportionality principle - the condition and permit for the use of non-ionizing radiation sources are determined against special interests, as well as the prices in relation to the benefit that the company has from its use, in relation to the potential risk of harmful effects arising from its use, where the level and duration of exposure of the population in a given case is taken into consideration, the age and health structure of the population potentially exposed, the manner, time and place of use of that type of source, the presence of other sources with different frequencies, and other circumstances of the subject case that are relevant;
3. principle of publicity - public insight into data on non-ionizing radiation.

Measures and recommendations for improvement

For protection against non-ionizing radiation, the following are considered mandatory measures:

1. determine the conditions of use of non-ionizing radiation sources of special importance;
2. provide organizational, technical, financial and other conditions that would implement protection against non-ionizing radiation;
3. records on sources of non-ionizing radiation of special interest;
4. mark sources of non-ionizing radiation that have a special interest and areas of dangerous radiation, on the basis of prescribed methods;
5. controlling and ensuring quality sources of non-ionizing radiation that have a special interest, on the basis of prescribed methods;
6. protection against non-ionizing radiation is achieved by using appropriate equipment and means;
7. controlling the degree of exposure to non-ionizing radiation in the environment and controlling protective measures implemented in relation to non-ionizing radiation;
8. provide material, technical and other conditions for systematic testing and monitoring of the degree of non-ionizing radiation within the environment;
9. the need for staff engaged in the field of protection against non-ionizing radiation within the environment to be continuously educated and professionally trained;



10. the obligation to inform the public about how non-ionizing radiation affects human health;
11. informing the public about the degree of exposure to non-ionizing radiation in the environment, as well as acquainting with the protective measures that are taken in this regard.

Noise and vibration – analysis of the current situation and recommendation

Current situation

In Kyustendil, the number of decibels with the highest noise level 68-72dB increased from 1 to 6 compared to the previous year. Subjective noise interference is accompanied by an unpleasant feeling due to the negative subjective feeling that the person has towards the noise that he registers with the sense of hearing. Such a mentioned negative and subjective relationship is of crucial importance when it comes to the manifestation of effects that are considered stressful. In order for a person to react negatively to noise, the following factors are of great importance:

1. if the sound has unpleasant physical properties;
2. sound reluctance;
3. if current activities are disturbed (communication, mental concentration, relaxation, sleep, recreation, etc.).

In contrast to other environmental problems, the problem of noise continues to increase, as does the number of complaints from people exposed to noise. Population growth, urbanization, constant advances in technology, new roads, international airports and railways "help" in making this problem even more complex.

In order to implement environmental noise protection in the municipality of Lebane, the following activities are included:

- measures and conditions for protection against noise in the environment are planned;
- noise in the environment is measured;
- a strategic noise map is made;
- data on the state of environmental noise should be available.



Recommendations

When it comes to legal and natural persons, which during the performance of activities affect or may affect the exposure to noise, the recommendations and measures that apply to them are:

- to participate in the investment, current and production costs of environmental noise protection;
- to provide an opportunity to monitor the impacts of their activities on the level and intensity of noise within the environment;
- to implement appropriate noise protection measures;
- to provide sound protection measures in the design, construction and reconstruction of traffic infrastructure facilities, industrial facilities, residential, residential-business and business facilities;
- to create conditions and measures by which harmful effects of noise can be prevented, reduced or eliminated (during the assessment of how much projects affect the environment, the evaluation of possible direct and indirect harmful effects of noise on the environment and population health is evaluated and conditions and measures which can prevent, reduce or eliminate harmful effects of noise are determined);
- to provide noise protection measures that are in accordance with the law, which regulates integrated prevention and control of environmental pollution, as a condition for the operation of the plant and activities for which an integrated permit is issued;
- during the technical inspection of other facilities, it must be determined which conditions are met as well as noise protection measures, that is sound protection.

Protection against chemical accidents – analysis of the current situation and recommendations

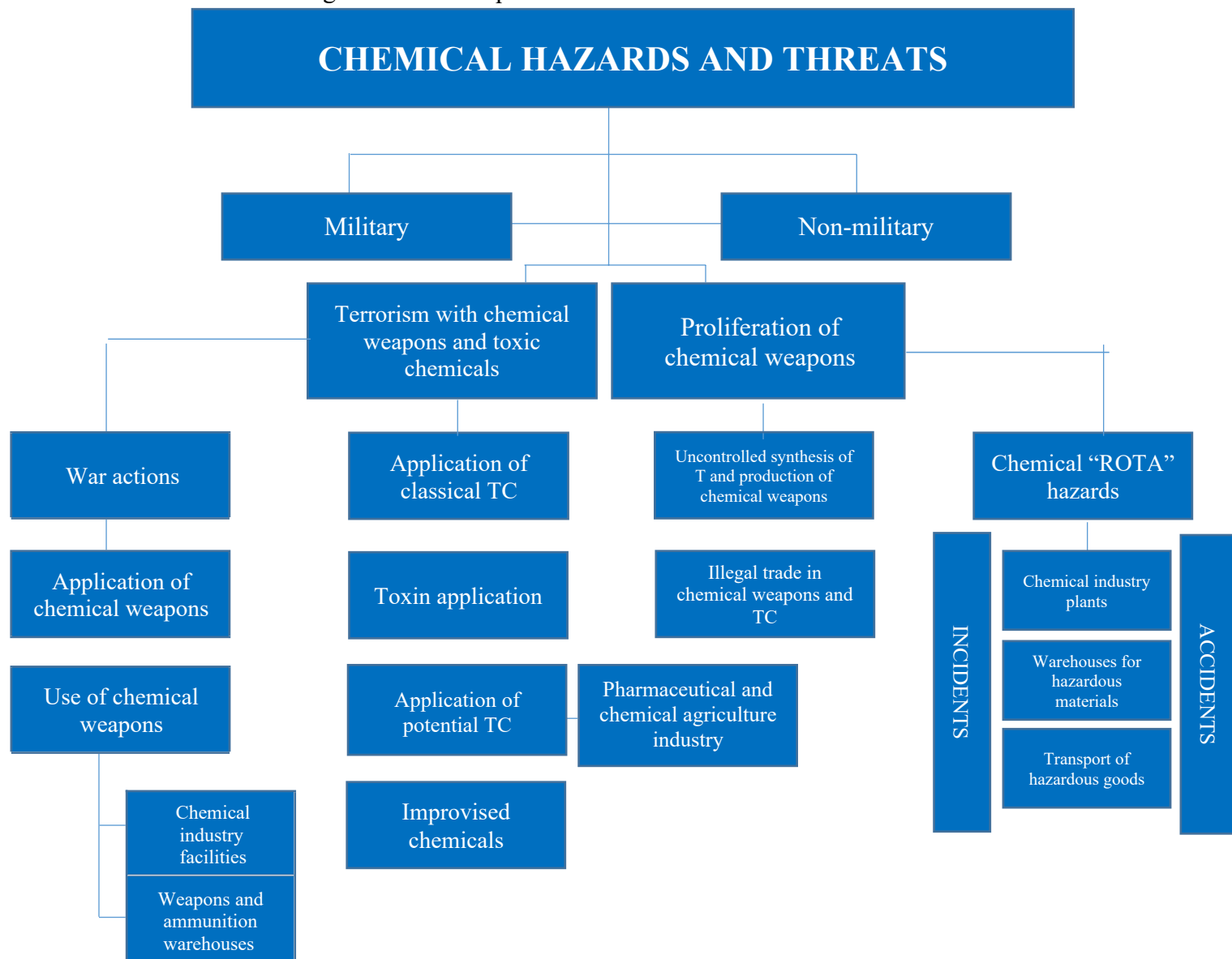
Current situation

There is a long list of all the things that can cause chemical accidents, with the most common fires, explosions, sabotage, traffic accidents during the transport of substances that are dangerous or storage errors.

Chemical accidents result in environmental pollution and poisoning of the living world, and often lead to death. However, it is considered that it is not the most important to immediately assess the degree of strength of a chemical accident. It is considered more important to react in



time and in the right way so that the consequences for the ecosystem would be as small as possible. When a chemical accident occurs, its severity is initially determined approximately, because there is no completely accurate data. Determining the degree - level of a chemical accident is done against the consequences that the accident caused.



Scheme 3.4. Schematic representation of chemical hazards and threats

Recommendations

In order to protect human health and the environment on the territory of the municipality, the following is considered mandatory:

- to establish integrated chemicals management;
- chemicals are classified, packaged and labeled;



- existence of an integrated register of chemicals;
- existence of a register for those chemicals that have been placed on the market;
- restricts and prohibits the production, placing on the market and use of chemicals;
- import and export of certain chemicals that are considered dangerous;
- obtaining permits for trade and use permits for highly hazardous chemicals;
- obtaining a permit with which detergents are placed on the market;
- established systematic monitoring of chemicals;
- provided monitoring and availability of information.

Chemical protection

Review of the condition

The strategy that helps to achieve safe management of chemicals and environmental protection within the region of the municipalities of Lebane and Kyustendil, can be simply explained as follows: first it is necessary to identify which chemicals are present, and then classify them based on health, physical and environmental risks. Labels and safety data sheets should then be prepared to communicate risks and related protective measures.

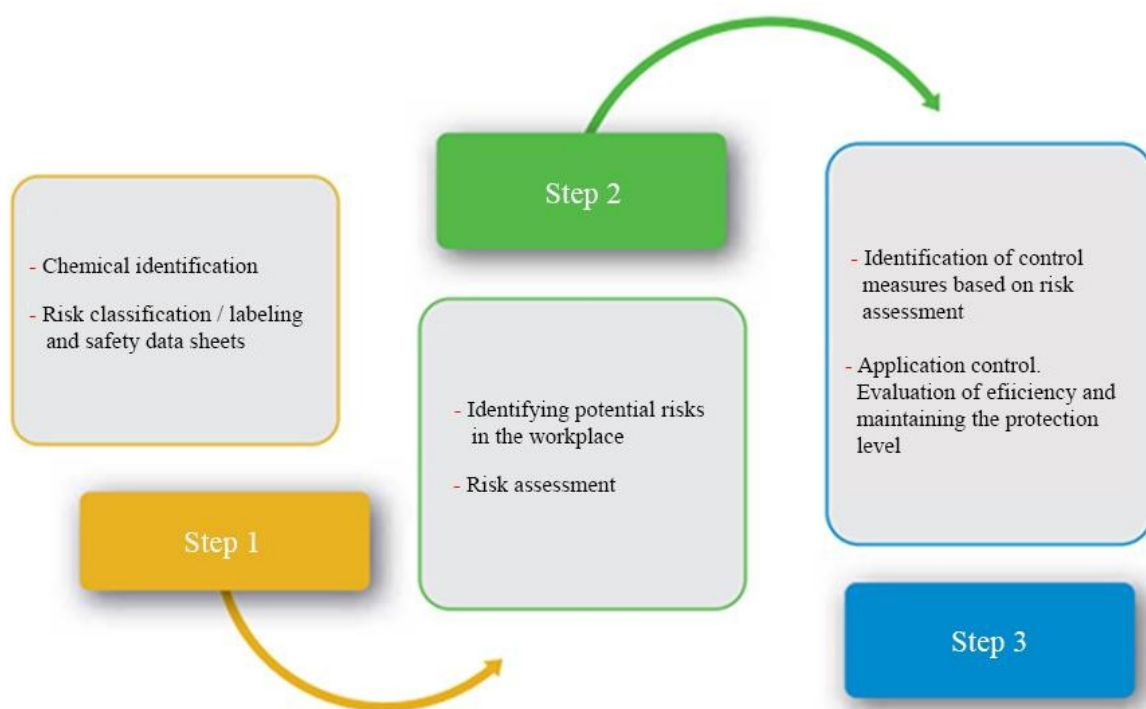


Figure 3.5. Safe chemical management



If there is no information on chemicals in the workplace or on those emitted into the environment, it is impossible to go further when it comes to impact assessment and determining which preventive measures and controls are appropriate. The information provides the basic structure necessary to achieve safe management of chemicals.

Recommendations

When managing chemicals, guidelines and recommendations are following:

- chemicals are managed by the operator, who should take measures to avoid the chemicals to adversely affect human health, the environment and property;
- manufacturers, importers or further users who place chemicals on the market assess the hazardous properties of those chemicals before placing them on the market and inform other legal and natural persons about it because the goal is to handle the chemicals safely;
- whenever possible a hazardous chemical is replaced by a safer alternative;
- each chemical and some of the products must be classified (classified by the manufacturer, importer or further user), labeled and packaged in accordance with the law and regulations adopted on its basis (obligation of the chemical supplier);
- hazardous chemical is a chemical that can be classified into at least one of the hazard classes;
- operators - manufacturers, importers, distributors or further users, who place chemicals on the market (suppliers) are obliged to keep records on chemicals (data on identity, further users and quantities delivered in a calendar year, as well as data on classification and marking) for at least 10 years;
- the supplier has the duty to submit the safety data sheet (in Serbian), to other distributors or downstream users, when placing a dangerous chemical on the market, as well as chemicals that can be determined to cause consequences for human health and the environment;
- the supplier is not obliged to submit a safety data sheet for a dangerous chemical intended for general use, if there is sufficient information for that chemical concerning safety, protection of human health and the environment, unless the further user or distributor insists on it;



- the supplier has the duty to amend the content of the safety data sheet in relation to new knowledge about the chemical and to deliver it to everyone in the supply chain to whom the chemical has been delivered in the previous 12 months;
- the operator (manufacturer, importer, distributor and downstream user) has a duty to store hazardous chemicals so as not to endanger the environment, human life and health, and their residues and empty packaging should be treated in accordance with the regulations relating to waste management;
- the supplier of some types, that is the quantity of the dangerous chemical, has the duty to appoint a person to take care of the proper management of those chemicals.

Possible impacts on flora and fauna, ecosystems, habitats, biodiversity, landscape features

Current condition

Deciduous and oak forests are dominant on the territory of the municipality of Kyustendil. Coniferous forests are a characteristic of the high mountain forest belt. A large part of the forest was turned into arable land. The area of the municipality of Kyustendil is also characterized by several types of flowers that are protected by law.

On the other hand, the whole idea of environmental protection and improvement for the municipality of Lebane is based on protecting space, optimally exploiting natural resources, protecting biodiversity, and to manage natural values, as well as natural and cultural assets in an environmentally friendly way, with preventive acting and controlling possible types and sources of pollution, as well as protecting and controlling the state of the environment.

Recommendations

The protection of natural values for the area from the municipality of Lebane to the municipality of Kyustendil includes the following general measures:

- to protect the structure of nature landscapes and natural resources, starting from the conditions of habitats for the permanent survival of the functions of nature landscapes, while working to prevent and reduce harmful impacts;
- to preserve and improve natural and artificial vegetation cover within urban centers (city center Lebane) and other settlements;



- to preserve fertility and improve solvency, ecological management and work on improving agricultural areas;
- existing natural and artificially raised vegetation covers (agricultural and forest belts) should be preserved and improved, as well as agricultural zones that are close to urban centers;
- vegetation planning, starting from field conditions, is carried out on lands whose vegetation has been destroyed or damaged to a large extent, and which do not have current application in agriculture and forestry;
- soil erosion in endangered areas, terrains and locations can be prevented and suppressed by anti-erosion activities, primarily afforestation;
- measures implemented for nature protection and care in the municipality of Lebane, with an emphasis on the perimeter of urban centers, condition the defense against extreme influences and the improvement of microclimatic conditions of the landscape;
- creation of new forest stands is necessarily based on the principles of ecological diversity;
- green areas that sprout within the city center and settlements (parks, squares, gardens, tree lines) reduce the concentration of gases with harmful effects in the air;
- during the research and exploitation of raw materials (embankments, excavations) the damage and degradation of nature and terrain necessarily happens, and it is considered obligatory that the degraded terrain is exposed to remediation and reclamation;
- maintenance of biological diversity in order to preserve natural processes, ensuring the diversity of habitats and living communities of flora and fauna, ensuring genetic diversity within species;
- elements of biodiversity of species and ecosystem should be preserved;
- hunting and fishing, as well as hunting and fishing tourism must be planned;
- when planning the construction area of a settlement, construction area intended for plants, roads, energy installations, attention should be paid to the natural structure in order to reduce the impact on the characteristics of the landscape itself;
- protection of diversity, uniqueness, beauty and values that natural landscapes have for the experience and recreation of people.

Care and landscaping includes:

- application of measures to ensure the sustainable use of natural resources, as well as the diversity, uniqueness and visual quality of nature;



- special attention should be paid to the landscape (topography), which must be thoroughly examined, valorized, protected and improved according to the European Convention on Landscape Protection, and in relation to lower-level plans for spatial units;
- application of the integrative model of establishing the system of green zones and corridors and their network connection,
- establishing biological connections between protected areas and other surfaces.

Measures implemented in the management and use of forests and forest land relate to:

- improving the condition of forests and forest ecosystems;
- preserving autochthonous flora and fauna;
- filling and reconstructing high diluted and degraded forest stands, in accordance with the forest management plan;
- converting and reconstructing indirectly and directly deciduous forests into high;
- improving the condition of existing private forests through indirect and direct conversion of coppice forests that have been preserved into high forest stands.

Measures implemented for the protection and conservation of wild species:

- in order to preserve biological diversity, natural gene pool, that is species that are especially important for the Republic of Serbia when it comes to ecological, ecosystem, biogeographical, scientific, health, economic or other aspects, wild species that are strictly protected have been declared, as well as the protected species;
- it is obligatory to prevent all actions and procedures that disturb the favorable condition of the population of wild species, which destroy or damage their habitats, litters, nests or disrupt their life cycle;
- must not use, destroy or undertake any activities that may endanger the species and habitats of plants, animals, fungi that are strictly protected;
- it is necessary to obtain a permit from the relevant Ministry in order to collect protected wild species of fungi, lichens, plants, animals and their parts, for their further processing, trade, cross-border trade, as well as plantation and farming;
- protected wild species may be used and collected only so as not to endanger the favorable condition of their population;
- in order to use wild flora and fauna, and in order for its trade to take place, the prescribed conditions for the protection of protected species must be strictly observed, and these



regulations concern the prohibited time on use, quantitative and qualitative restriction in use, spatial ban on use due to populations restoration;

- in order to perform the activity of import, export, entry, amount or transit, trade and breeding of plant and animal wild species that are endangered and protected, as well as their parts and derivatives, permits and other acts must be issued (affirmations, certificates, opinions).



IV PROMOTION OF ACTIVITIES OF DEFINED MEASURES AND GUIDELINES BY THE ECO-PLAN OF THE MUNICIPALITIES OF LEBANE AND KYUSTENDIL

The promotion of the activities defined by the eco-plan will be carried out against the target groups to which the promotion refers, and will take place in a number of segments:

1. The first segment refers to the inhabitants of the region between the municipalities of Lebane and Kyustendil, in order to be informed about the priorities in environmental protection and to encourage them to take an active part in the implementation of activities envisaged by this eco-plan. Residents will systematically receive information on such issues through the assembly of tenants, local communities, while primary and secondary schools, as well as the Youth Office, will inform children and the younger population about these issues. In addition to all that, the citizens will receive additional information through the websites of the municipalities of Kyustendil and Lebane.
2. The second segment refers to those who make decisions, who will get acquainted with certain issues defined in the action plans for each specific area, through professional services, while working to promote the goals and activities related to realization of the eco-plan to the population of the area between the two mentioned municipalities, as well as to the public through the media and taking personal part in certain activities.
3. The third segment is related to the promotion aimed at donors and investors and which aims to get to know the problems, challenges and opportunities related to environmental protection in detail.
4. The fourth segment is related to the promotion of joint plans and implementation of activities and which is aimed at creating a network of institutions, professionals, civic associations and other stakeholders.

The basis of the concept of protection and improvement of the environment for the observed area are protection of space, optimal exploitation of natural resources, protection of biodiversity, environmentally friendly management of natural values, natural and cultural assets, prevention and control of possible forms and sources of contamination, and prevention and control of the environmental state.

In order to achieve a sustainable and environmentally friendly way of managing the space, natural resources, cultural heritage, natural values and environment covered by the Plan, spatial valorization was conducted. In order to assess the possible impacts, effects and consequences



for the natural and environmental environment, the Spatial Plan was evaluated from the point of view of environmental protection. The result of valorization, if the criteria for sustainable eco-zoning and possible important impacts, conditions of further development and ensuring the capacity and quality of the environment are taken into account, is the separation of ecological units and zones.