



ACTION PLAN FOR THE PREVENTION OF SOIL, AIR AND WATER ON STARA PLANINA MOUNTAIN IN THE CROSS-BORDER REGION PIROT-MONTANA

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INTRODUCTION

Prevention of soil, air and water is of vital importance to the life of the planet. Their pollution can lead to detrimental consequences for humans as well as for animals and plant species. Taking measures to protect them becomes more and more necessary.

The current document is an Action plan for the protection of soil, air and water of Stara Planina in the cross-border region of Pirot-Montana. Its main objectives are to emphasize the importance of the cited natural resources as well as to offer positive joint models for the preservation and improvement of their quality. The proposed models will serve to achieve three main objectives:

- ❖ **Prevention and improvement of the soil condition in the cross-border region of Pirot-Montana;**
- ❖ **Prevention and improvement of the air quality in the cross-border region of Pirot-Montana;**
- ❖ **Prevention and improvement of the state of the water in the cross-border region of Pirot-Montana.**

The cross-border region of Pirot-Montana has a rich and beautiful environment. It includes many protected areas and nature parks not only characterized by tourist attractiveness and opportunity for economic development and prosperity in this direction, but also reflecting the spirit, nature and beauty of the Balkan Peninsula. Taking preventive measures to minimize risks for soil, air and water is of importance for the conservation of the whole environment.



The current document sets out joint measures for the protection of soil, air and water in the cross-border region Pirot-Montana.

The measures are in a fully compliant with the following documents:

- ❖ Municipal Plan for Development of the Municipality of Montana 2014-2020;
- ❖ Sustainable Development Strategy of the Municipality of Pirot 2015-2020;
- ❖ Europe 2020 Strategy: A strategy for smart, sustainable and inclusive growth;
- ❖ Natura 2000.



1. MONTANA DISTRICT

Montana District is situated on a territory with a total area of 3 635 sq. km and is located in the central part of North-western Bulgaria. In the southwest, the area borders with Serbia, and its northern border is the state border with Romania - the Danube river. The three countries have good opportunities for cross-border cooperation in ecological, economic and social terms which can have a positive impact and are even advisable.

The administrative division of the district includes eleven municipalities: Berkovitsa, Boychinovtsi, Brusartsi, Varshets, Valchedram, Georgi Damianovo, Lom, Medkovets, Montana, Chiprovtsi and Yakimovo.

The relief of the Montana District is varied. It covers the Petrohan saddle, to the south it passes into the mountain, covering parts of the Balkan, and its northern part is situated in the Danube Plain. The climate of the region is humid continental and is characterized by low temperatures in winter and high temperatures in summer. The area has a great forest richness, including black pine, spruce, oak, beech, various shrubs and herbs. There are minerals in the area such as granite, limestone, industrial minerals, fluoride and diabases. Between the Cibritza and Lom rivers, its found lignite coal deposit, which is spanning upon 300 sq. km. Their calorific value is low and therefore they are not exploited. In the villages Kopilovtsi, Govedzhda and Dalgi Del have been discovered copper, silver and gold ores, and in Chiprovtsi Municipality - lead, iron and silver. Their quality is not high and therefore their economic value is not big.

One of the most valuable natural resources of the region is the mineral springs, which are of national importance. The hot mineral springs are located in the villages of Spanchevtsi, Varshets, Borovtsi, Zamfirovo and Barzia.

Montana County River Network includes Lom, Ogosta, Cibrice and many of its tributaries. The Lom River is formed by smaller tributaries and springs from the main Stara Planina ridge of the village of Gorni Lom.

The following protected areas are located on the territory of the District:

- ❖ **Protected area "Kopren - Ravno Buche - Deianitza - Kalimanitsa";**
- ❖ **Protected area "Ribarnitsi Orsoya";**
- ❖ **Protected area "Kaleto";**
- ❖ **Protected area "Kitka";**
- ❖ **Protected area "Uruchnik";**
- ❖ **Protected area "Usketo";**



❖ Reserve "Gornata Coria";

❖ Reserve "Ibisha"

The listed protected areas represent natural landmarks characterized by rich natural resources. On the territory of the Montana District, there are many springs, waterfalls, rock formations, earth pyramids, sand dunes and mineral deposits. They are extremely important due to their uniqueness both for the development of tourism in the area and for the development of science.

2. PIROT DISTRICT

Pirot District is located on the south-eastern part of Serbia and extends to 2761 sq. km. The administrative centre of the county is the town of Pirot, which is located on Nishava river. The relief of the area is diversified.

There are 72 settlements in the municipality of Pirot: 1 town - Pirot, which is the centre of the region and 71 villages.

The area is characterized by beautiful nature and high potential for tourism development. The reason for this is the large stretches of virgin nature, vast mountain forests, clean lakes, rivers and variegated vegetation.

The Stara Planina river basin deducts to the Black Sea basin. All rivers in Serbia on the territory of Stara Planina flow into the Timok and Nishava rivers. The Nishava River springs below the "Kom" peak, located in Bulgaria, and the Timok River springs under the "Babin zub" peak, located in Serbia. The Serbian region is characterized by numerous rivers and streams such as the Yelovishka River and the Doikinska River, which flows into the Visocica River, which in turn joins the river Toplodolska and then they form Temshchitsa river, flowing into the Nishava River.

The Stara Planina massif in Serbia is characterized by a total area of 1802 sq. km. In 1997, the Government of the Republic of Serbia declared Stara Planina as a protected nature park with a territory of 142,000 ha. The natural sights and reserves forming the Stara Planina Nature Park are:

❖ On the territory of Knyazhevac Municipality: "Babin zub"; "Golema reka"; Draganishte;

❖ On the territory of the Municipality of Pirot: Cheren bor; Smurche; Hrast luzhnyak, Copren, Vrazhia glava, Tri chuki bratkova strana;



Stara Planina Nature Park is characterised with rich biodiversity and a wealth of natural sights. Undertaking cross-border measures to protect ecologically pure nature in the cross-border region is essential to preserve the uniqueness of the Stara Planina.

3. SOIL

THE IMPORTANCE OF SOILS IN THE CROSS-BORDER REGION PIROT-MONTANA

Soil is a complex natural system created of mineral particles, organic materials, water, gases, macro and microorganisms. Mineral particles form the bulk and organic matter makes up from 10% to 20% of the chemical composition of the soil. It is perceived as a living system because it has constantly important part in the process of formation or disintegration (so called erosion). Based on these facts, we can conclude that without soil cover the natural and cultural vegetation are impossible to exist. Soil cover is a particularly important component of the natural environment. Formed for millions of years, the interconnections between the other components of the natural environment (rocks, waters, climate, vegetation, human activity) are reflected and formed.

Thanks to its fertility, the soil cover is also a very important natural resource. Soil has big value in agriculture. As a result of human activity, the fertility of the soil can be changed (increased or decreased) or preserved. There are three types of fertility - natural, potential and economic. The first is related to the presence of humus and other nutrients formed during the long period of natural soil development. Potential fertility is associated with the possibility of artificially increasing nutrients in the soil by adding fertilizers of natural or artificial origin. Economic fertility is expressed by the value of agricultural production per unit area on a given type of soil.

Considerable attention should be paid to the relationship between soil cleanliness and flora and fauna. Without unpolluted soils there can be no sustainable population of plant species growing in their designated regions and altitude. Plants are a major factor in air cleanliness and in attracting tourists from an economic point of view. Here comes the importance of the fauna. Without a well-developed flora, there is no way to have a suitable habitat for a variety of animals, reptiles and birds that need such a living environment. The degradation period of most substances is significantly longer when they are in the soil than when they are in air or water.

Apart from the fact that the soil depends on all types of economic activity and it serves to maintain the life of different ecosystems, it is also a basic prerequisite for the life of the society.

Every construction activity poses a serious risk of soil contamination. The process of construction works most often begins with the clearing of the vegetation in the defined area, then the upper soil layer is removed, which increases the possibility of soil erosion. Also, the



initial removal and subsequent restoration of the soil layer can lead to structural changes. An integral part of the construction is the risk of contamination with different types of chemicals from the materials used, which in most cases have a number of soluble ingredients that cause lasting damage to soil quality. The effects on groundwater and surface water must also be assessed. In the event of an incident, the damage can grow exponentially over time, due to the impossibility of retaliation and difficulty in defining the problem. In many places, groundwater is used directly for drinking purposes. This is a standard practice, especially in places where there is no water supply and purification infrastructure, as it remains the most reliable resource for fresh water supply as it avoids any risk of surface contamination of water bodies.

One of the main risks for soil contamination stems from livestock breeding. The lack of good management of animal waste and waste of water in livestock farming often pollutes water bodies and soils nearby.

The soils in the cross-border region Pirot-Montana are part of the Carpathian-Danube soil sub-area and the Stara Planina middle-ground soil belt. The Stara Planina mountain range, also known as the belt of brown forest soils, covers the areas from 600 to 1800 m above the sea level. It is formed mainly of brown forest soils. On the territory of the region are also spread the soils - Luvisols, as well as Planosols. Characterized acidity, their use becomes difficult and erosion becomes a pressing problem. Therefore it is necessary to take measures for their protection.

Apart from the fact that soil cleanliness is a fundamental factor for flora and fauna, it is equally important for the waters in the region. The relationship between water and soil is two-sided. Water is an important factor for the flow and realization of all soil-forming processes.

4. WATER

IMPORTANCE OF WATER IN THE CROSS-BORDER REGION PIROT-MONTANA

Drawing attention to the waters in Stara Planina, and in particular to the cross-border region of Pirot-Montana, we should point that they are the main force influencing the formation of the relief of the region. Water is the main resource for the existence of any biological life on earth, and to a large extent a resource that is a very important economical factor.

Major risks to water pollution of each type arise from agriculture and mining. In agriculture, these risks mainly result from the use of fertilizers and preparations with an increased content of nitrogen and other nitrate substances, which has a negative impact on water quality. Some of these substances also pose risks to human health. Pollutants of this type do not pose a major hazard in drained waters where the dissolved oxygen level is higher but in static or underground ones, the risk of adverse long-term effects is significant. These risks are closely related to climate and seasons. They occur mainly in the summer months, as the air temperature increases. Waters may become unsuitable for agricultural purposes, and also

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unsuitable in economic aspect for tourism, leisure and entertainment. Such types of pollution results from the excessive or inappropriate use of organic and mineral fertilizers as well as their derivatives.

Much of the water pollution is caused by the accidental or deliberate discharge of substances into water bodies, which at first sight are not harmful or toxic. This can happen suddenly or over a very long period of time. Such waste types can be, for example, dairy waste, purified or untreated waste water, food or textile waste, hotel and spa complexes, etc. Why non-toxic substances can cause very serious problems for the water, the soil and the surrounding flora and fauna? The reason for that is the easy degradability of such substances. In an unpolluted river with a stable ecosystem, all living organisms in it are accustomed to the content of a certain amount of oxygen in the water. In the uncontrolled discharge of large quantities of waste, the chemical composition, the amount of oxygen and nutrients in the water changes. Such a pollution can lead to the seemingly invisible disappearance of small organisms to reach levels of substances dangerous to human health, such as ammonia.

Discharging hot water while cooling power plants, industrial turbines or other similar facilities also poses risks. When this water is discharged into water bodies, species density and water biology can be changed. Such type of pollution can be harmful as a consequence of toxic waste.

The cross-border region of Pirot-Montana is characterized with water wealth. Two Bulgarian rivers - Ogosta and Lom – spring from there. Draining into the Danube River, they form a tangled network of many smaller rivers, such as the Dulgodela River, the Prevalski River and the Chiprovka River, from the Ogosta River - Chuprene River and Chuprenska River from the Lom River. These rivers and their tributaries form the relief of the region. Drainage waters are of particular importance for the rivers, and that is why sudden fluctuations in the water quantities of rivers are often observed. There is a low water level during the summer and autumn, and during the seasons of winter and spring, large water springs appear due to heavy rainfall and snow melting. The main high-water rivers are observed between March and June. Other rivers in the region are Nishava, Erma, Raznisha Reka and Temshtica.

5. AIR

THE IMPORTANCE OF AIR IN THE CROSS-BORDER REGION PIROT-MONTANA

Air pollution has a strong impact on the environment. However, air can be contaminated by the surrounding environment. When the flora and fauna are destroyed, the possibility of air pollution is getting higher. The polluted air damages directly the human health. This is a local, Pan-European and international problem as pollution in a given location can be transferred to another by atmospheric conditions and changes.



In most cases, air pollutants are caused by humans but can also have a natural origin. Most often, they are burning fossil fuels in industrial productions or from power plants, solid fuel heating in many households in the settlements, processes in the chemical and mining industry, agriculture and others.

Air quality is determined by different specifications, with no pollutant exceeding the specified standards. In order to monitor quality, measurements should be taken periodically and changes over previous periods should be observed. The air quality is directly dependent on external artificial pollutants and because of that responsible pollution control must be established.

Air, especially in risk areas, such as large settlements or industrial zones with large enterprises, should be measured periodically, and data should be compared with previously set goals. If the predetermined maximum levels for certain particles are exceeded, the contaminated region must be monitored and the source of the pollution detected. The necessary measures must then be taken to prevent contamination, depending on its causes and source.

Another important fact is that near chemical factories that pollute the air by emitting toxic gases, ecosystems have impaired basic functions. Often due to changes in the air structure, many plant species do not thrive and die. Similarly, industrial plants, which emit large quantities of dust into the atmosphere, such as cement plants, are also affected. This fog takes the form of clouds that are transported to tens of kilometres from the factory and have their negative influence.

6. PRINCIPLES FOR THE PREVENTION OF SOILS, AIR AND WATER IN THE CROSS-BORDER REGION PIROT-MONTANA

The current action plan sets out the following joint principles for the prevention of soil, air and water in the cross-border region Pirot-Montana:

Principles for the prevention of soil, air and water in the cross-border region Pirot-Montana

- ❖ PREVENTION OF SOIL POLLUTION, AIR AND WATER;
- ❖ PREVENTION OF RISKS FOR HUMAN HEALTH;
- ❖ PREVENTION OF RISKS FOR THE ENVIRONMENT;
- ❖ INTEGRATING EUROPEAN POLICIES AND GOOD PRACTICES ON



ENVIRONMENTAL PROTECTION;

- ❖ TEMPORARY INFORMING CITIZENS ON THE CONDITION AND THE RISKS OF ENVIRONMENTAL POLLUTION;
- ❖ ESTABLISHING PREREQUISITES FOR ACTIVE CIVIL PARTICIPATION IN THE DECISION-MAKING PROCESS FOR ENVIRONMENTAL PROTECTION.

7. VISION, MISSION AND OBJECTIVES OF THE JOINT ACTION PLAN FOR THE PREVENTION OF SOIL, AIR AND WATER IN THE CROSS-BORDER REGION PIROT-MONTANA

7.1 VISION

VISION

Ecologically clean cross-border region, characterized by a green and attractive nature, achieving sustainable and economic development and providing a quality living environment.

7.2. MISSION

MISSION

Prevention of the risks for soil, air and water pollution in the cross-border region of Pirot-Montana.



7.3. OBJECTIVES

From the set vision and mission of the present Joint Action Plan for prevention of soil, air and water in the cross-border region of Pirot-Montana, the following three main objectives arise:

- ❖ **Prevention and improvement of the soil condition in the cross-border region of Pirot-Montana;**
- ❖ **Prevention and improvement of the air quality in the cross-border region of Pirot-Montana;**
- ❖ **Prevention and improvement of the state of the water in the cross-border region of Pirot-Montana.**

8. MODELS OF JOINT FORCES FOR THE PREVENTION OF SOIL, AIR AND WATER IN THE CROSS-BORDER REGION PIROT-MONTANA

SOIL	❖ Conduction of a study to obtain accurate information on the level of soil contamination; ❖ Establishment and implementation of a joint monitoring system for soil contamination; ❖ Creation of a joint program for responsible supervision; ❖ Establishment of a joint plan for control of the pollution from the enterprises; ❖ Use of livestock manure for agricultural purposes in appropriate quantities for the needs of the treated plants; ❖ Organization of joint campaigns for raising awareness and involvement of citizens in the creation and implementation of environmental policies;
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	❖ Development of a joint plan for the prevention of new sources of pollution; ❖ Strengthening regulation on environmental pollution; ❖ Promoting the use of new technologies that have a lower unfavourable effect on soils; ❖ Management of animal waste and waste of water.
AIR	❖ Implementation of air quality control; ❖ Implementation of an analysis of the sources of harmful emissions on the territory of the cross-border region, with a view to their prevention; ❖ Improving air quality: Developing a new program to reduce air pollutant levels; ❖ Using innovative tools to prevent the pollution.
WATER	❖ Directly engaging and timely informing the municipalities within the territory of the cross-border region about the occasions that may cause direct and indirect damage to the water bodies in their territories; ❖ Management of artificial water basins; ❖ Animal waste control / <i>most commonly livestock farmers gather large amounts of animal waste in one place and the soil is in direct contact with the manure. Rainwater soaks much of the toxic food residue and penetrates the ground through the soil. Also, animals are often raised in barns that are not suited for collecting and purifying sewage, and they are poured freely into the soil or into pits, which furthermore concentrate contamination. To avoid all this, manure must be stored in specially designed cement basins. The basins must meet standards which ensure that no waste water can leak into the</i>



	<i>soil. In such a basin, manure must be able to stand for at least 6 months in order to be used for agriculture purposes/.</i> ❖ Implementing control of the purification methods and the emissions that are emitted voluntarily or unintentionally in nature. Waste water from industry contains pollutants. Each type of production generates strictly individual and different types of waste water. ❖ Creation of new centralized sewage treatment plants and water supply infrastructure; ❖ Introduction of modern local purification systems, such as separate dry lavatories and artificial waste lakes, as well as treatment of the waters with the appropriate preparations; ❖ Implementation of public activities in which citizens are directly involved in the protection of water.
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9. S.W.O.T и L.O.A.D анализи

S.W.O.T.	L.O.E.D.
Strengths ❖ Rich natural resources; ❖ High potential for development of tourism (Balkan-tourism, eco, balneological, etc.) ❖ Favourable climate conditions; ❖ Relatively clean environment; ❖ Developed infrastructure networks;	Upgrade ❖ Promoting the region as an attractive tourist destination, characterized by rich nature and providing opportunities for Balkan, eco and balneal tourism; ❖ Prevention of the risks from new productions which can influence and pollute the environment; ❖ Establishment of modern technical purification systems



Weaknesses ❖ Technological deficiency in terms of environmental protection; ❖ Fragmented agriculture, influencing the environment; ❖ Lack of a well-functioning environmental protection mechanism; ❖ Insufficient awareness of citizens about their role in environmental protection;	Overcoming ❖ Implementation of projects for acquiring new technological solutions for environmental protection, in particular soils, air and water. ❖ Lobbying for new legislative changes to protect the environment; ❖ Conducting of events and awareness campaigns for citizens;
Opportunities ❖ Use of EU funding to develop new environmental protection mechanisms; ❖ Development and promotion of the tourist attractiveness of the region; Attracting foreign tourists; ❖ Establishment of helping methods for the development of environmentally friendly agriculture. ❖ Development of organic production;	Use ❖ European Union Programs for Environmental Support; ❖ Innovative methods for popularizing the opportunities for tourism on the territory of the region; ❖ Elaboration of a new strategic plan for support of ecologically clean agriculture and organic production;
Threats ❖ Achieving high levels of soil, air and water pollution; ❖ Lack of funding, supporting environmental protection mechanisms; ❖ Insufficient capacity for absorption of funds from the European Union for the protection of the environment.	Protection ❖ Applying for funding from international and European programs for soil, air and water protection. ❖ Municipalities: Undertaking joint measures for the protection of the environment; ❖ Conducting communication campaigns; ❖ Conducting joint environmental initiatives in which citizens from the region can participate.



Soil, water and air are in constant interconnection. If there is a problem with one of the natural resources, it is likely that a problem will arise upon the rest. If pollution or damage is already caused, the process of soil, air and water recovery may be impossible. Opportunities for remedial measures are very costly and continue for many years. That is why the best that can be done is the timely prevention of pollution.