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## **HYDROSPHERE IN THE REPUBLIC OF SERBIA: LEGAL FRAMEWORK, CONDITION AND MECHANISMS OF RESTORATION AND PROTECTION THROUGH THE GREEN TRANSITION PROCESS**

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**Abstract:** *The right to clean water is recognized as human right, although, it is considered within the framework of the rights to the clean environment. It can also be viewed independently. However, for the purposes of this paper, we will consider the right to water within the framework of the right to a healthy environment. The aforementioned rights represent human rights guaranteed by numerous international treaties and acts of a declarative nature. The water regime in Republic of Serbia is considered to be the most unfavorable one in Europe, with major flaws reflected in the incomplete sewage network, with an insufficient number of collectors for wastewater treatment, as well as insufficient control of scattered (diffused) emissions of polluting agents. The enormous pressure on the water regime in the Republic of Serbia does not give us the possibility of an individual approach to the problem solution. It is necessary to have a comprehensive plan, which would be implemented by combining different sectoral policies and by implementing mutually compatible programs. Solving certain issues such as the occurrence of eutrophication, the emission of phosphorus, heavy metals and other substances can give full results only as part of a broader action plan.*

**Key words:** *Hydrosphere pollution, Green Agenda, sustainable development, human rights.*

## INTRUDUCTION

Despite the fact that this issue has a large interest in general public opinion, scientific research has faced insufficient and inadequate knowledge on many issues in this area. Since we have breached the environmental burden with reckless actions, there is not much room left for further mistakes. Therefore, continuous reaserch of this problem is necessary, with the aim of finding and implementing mechanisms to stop further environmental violations and improve the existing condition.

Earth is one huge reactor, with a large number of interconnected processes taking place. The change of any factor is reflected in a whole range of mutually conditioned physical, chemical and biological flows. Therefore, the enormous pressure on the water regime in Republic of Serbia prevents us from having an individual approach in solving the problem. It is necessary to have a comprehensive plan, to bring together a whole variety of policy sectors by implementation of adjuted projects. Solving certain issues such as eutroification, phosphorus emissions, heavy metals and others can only yield full results as part of a wider operation.

The fact that the water regime in Republic of Serbia counts as the most disadvantaged in Europe is evident in an incomplete sewage network with insufficient collectors for wastewater purification as well as insufficient control of scattered (diffused) emissions of polluting substances.

In addition to the percentage of residents covered by wastewater treatment being on a slight rise, it is, in reality, still worryingly low. Also, a small number of industrial plants purify their wastewater. If we add scattered sources of pollution that significantly affect the quality of surface waters, groundwater and soil, we get a complete picture of the enormous pressure of pollutants on water quality in the Republic of Serbia. The amount of unpurified wastewater averages a whopping 374.7m<sup>3</sup> per year.

It is necessary to implement active measures as soon as possible and increase the number of wastewater treatment plants, as well as include measures of systemic control of scattered sources of pollution including protective or preventive measures in areas where water and soil are most threatened. The Republic of Serbia

should also develop its own growth strategy and transform itself into a just and progressive society with a modern and competitive economy based on efficient consumption of resources by implementing a model of circular economy and sustainable development. In addition, it must strive to adopt regulations in a given area while placing emphasis on fighting crime and corruption while ensuring more comprehensive implementation of the legal regulations. As everything is connected in nature, solving the problem of enormous pressure on the water regime in Republic of Serbia must include solving the problem of climate change, air pollution and soil pollution.

Solution proposals outlined in this paper, after providing a legal framework should be implemented with continuous monitoring, measurement and compliance with the overall development of the situation with an awareness of continuous adjustment in accordance with developments and newly established experiences.

## **1. LEGAL FRAMEWORK**

### **1.1. International law**

Technological development has already been the bearer of overall progress and growth from the very beginning of industrial realization, along with many negative effects. Social sciences like economics, law, sociology, etc. Have not stagnated, but the accompanying accelerated flow constantly takes precedent and gives new frameworks of dynamic social relations. Oversights in these processes have brought about inevitable consequences in various forms. Thus, endangering the environment eventually emerged from the framework of local industrial centres and became a visible problem of global proportions that should be contained before it is too late.

During the 1950s and 1960s, the rapid development of environmental rights began as a separate branch of international public law. A conference held in Tehran in 1968 was dedicated to the negative impacts of scientific technological development on human rights. That same year, the UN General Assembly passed a resolution number 2389 emphasising the link between enjoying basic human rights

and a healthy environment.<sup>1</sup> These circumstances led to the establishment of further regulation in this area, resulting in the emergence of numerous bilateral and multilateral international agreements and acts of declarative character.<sup>2</sup>

Along with the adoption of these international agreements, the right to a healthy environment began to be exercised in an indirect manner, through the application of mechanisms for protection of the right to life, health rights and property rights, etc. The protection of these human rights has contributed to the process of forming a new law, whose subject of protection extends beyond the scope of protection stipulated by above mentioned rights. In this way, the right to a healthy environment is classified as of the utmost importance, providing it with mechanisms for protection of human rights. As such, it has been repeatedly confirmed in international law, as witnessed by numerous resolutions, one of the last in the 16/11 series of "Human Rights and the Environment", adopted by the UN Human Rights Council in 2011. year.<sup>3</sup>

Therefore, the introduction of the right to a healthy environment in human rights should not be understood as putting human at the forefront, but rather the environment which represents a key factor in the human existence.

The right to water is also recognized as a special human right, therefore, in addition to looking at its importance within the right to the environment, it can be considered independently. The appropriation of this right has been carried out on a number of occasions, in particular to be singled out by UN Resolution 64/292 in 2010. In 2013, under the name Human right to water and sanitary conditions. As part of Article 1 of this Article, the stated resolution of the right to water is defined as a human right that is a prerequisite for the enjoyment of other human rights. In

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<sup>1</sup> Final act of the International conference on human rights, 1968, <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N68/958/82/pdf/N6895882.pdf?OpenElement>, 03.08.2022.

<sup>2</sup> More precisely, there are 1,998 valid treaties, of which 1,476 are bilateral and 522 are multilateral international treaties - ECOLEX, The Gateway to Environmental Law, 03.08.2022. [http://www.ecolex.org/result/?q=&type=treaty&xdate\\_min=&xdate\\_max=&tr\\_status=In+force](http://www.ecolex.org/result/?q=&type=treaty&xdate_min=&xdate_max=&tr_status=In+force)

<sup>3</sup> Resolution adopted by the Human Right Council 16/11, „Human rights and the environment“, 2011, [http://www2.ohchr.org/english/bodies/hrcouncil/docs/16session/A.HRC.RES.16.11\\_en.pdf](http://www2.ohchr.org/english/bodies/hrcouncil/docs/16session/A.HRC.RES.16.11_en.pdf) 25.07.2022.

2015, there were 1,000,000 people in At the UN General Assembly, Agenda 2030 was adopted, which defines the right to water even closer and emphasises the importance of this right to achieve sustainable development. Developing the judicial practice in the context of further human rights establishment to water standards is an important task for the future.<sup>4</sup>

Protection of international waterways and seas is guaranteed by numerous conventions such as the European Treaty on limitation of use of certain detergents, Strasbourg 1968. The Convention on the Right of Non-Naval Use of International Waterways since 1997. In 1999, the Protocol on Water and Health was adopted in London in 1999. Year, which amended the Convention on protection and use of cross-border waterways and lakes adopted in Helsinki in 1982, and many others. These rules envision obligations to protect and preserve international waters and their ecosystems. It is inevitable that recent efforts towards resolving environmental problems such as the Kyoto Protocol since 1997 have been mentioned. Since 2000, the Millennium Declaration has been in the force. Paris Agreement was signed in 2014 and a Conference held in Glasgow in 2021. Year. Although these regulations do not establish direct protection of water rights as a basic human right, they certainly stress the necessity of establishing universal water protection standards, including through the normative framework for protecting human water rights.<sup>5</sup>

For us, particularly important provisions on protection of the waters of the Danube Basin are contained in numerous bilateral and mulilateral contracts. Here we can point out the Convention between the FNRJ, NR Romania, NR Bulgarians and the USSR on fishing in the waters of the Danube signed in Bucharest in 1958. In 1985, followed by the Danube Conference on Water Issues of the Danube River. a step further was made by the Convention on Co-operation for the Protection and Sustainable Use of the Danube River, in Sofia 1994, which established the

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<sup>4</sup> Marijana M. Mladenov, Goran LJ. Milojević, „Ljudsko pravo na vodu sa posebnim osvrtom na praksu Evropskog suda za ljudska prava“ Pregledni naučni rad UDK: 342.7 doi 10. 5937/spz63-22127, 110.

<sup>5</sup> Marijana M. Mladenov, Goran LJ. Milojević, „Ljudsko pravo na vodu sa posebnim osvrtom na praksu Evropskog suda za ljudska prava“ Pregledni naučni rad UDK: 342.7 doi 10. 5937/spz63-22127, 111.

International Commission for the Protection of the Danube River. Republic of Serbia became a full member of the International Commission for the Protection of the Danube River in 2003. In 2013, reaffirming once again its obligations to respect the principles, rules of protection and sustainable management of this river.

Searching for data on a large number of dotted and scattered sources of pollution that put pressure on water quality in Republic of Serbia, the main question is the implementation, more precisely the level of law enforcement of those conventions, worldwide and in Republic of Serbia, especially, This approach is necessary to go beyond mere legislation without achieving substantive results.

As the Republic of Serbia is a candidate country for EU membership, it has accepted the fulfilment of numerous obligations on the road to harmonisation with the Union's institutional framework standards and legal requirements. Accession negotiations were initially sorted into 35 chapters until 2020 when the new methodology divided the negotiation chapters into six thematic clusters. Negotiations on each cluster open as a whole after the previous measures are met, first opening the most important issues and closing the last part the progress in these areas determines the rhythm of the entire negotiations. Since the adoption of the revised enlargement methodology, at the second intergovernmental conference held on 14.12.2021. Cluster 4 – Green Agenda and Sustainable Connectivity opened in 2010. thematic clusters. This cluster consists of four chapters, the rights and notices arising from chapter 27. environment and climate change, certainly are the most important for this work. 6

The new initiative, which is expected to encourage green transparency of the economy and society, is the Green Agenda Declaration for the Western Balkan countries adopted in October 2020. [Getty Images] The Republic of Serbia has committed to implementing actions in accordance with the Green agendas objectives through the implementation of the Regional Action Plan adopted at the Summit in Slovenia in October 2021. Year. Also, the countries of the region recognised the European Green Agreement as a strategy for sustainable EU growth in order to transform into a just and rich society with a modern and competitive

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<sup>6</sup> EU u Srbiji, „Srbija otvorila EU pregovarački klaster 4 – Zelena agenda i održivo povezivanje“, <https://europa.rs/srbija-otvorila-eu-pregovaracki-klaster-4-zelena-agenda-i-odrzivo-povezivanje/> 05.08.2022. god.

economy that uses resources effectively. One of the important elements included in the Decree concerns the Econm-Investment Plan, which seeks to support a long-term green social recovery of this region while achieving sustainable economic development. The process includes a series of reforms on the road to the EU and the western Balkans' approach to the EU single market.<sup>7</sup>

The Framework Water directive was adopted by the European Commission in December 2000. which is the EU's most important act in the field of water with the aim of comprehensive water protection and with the water of connected ecosystems to improve the health and well-being of citizens. For the purpose of implementing the objectives of the Framework Water Directive, joint strategies called CIS Guides (CIS – Guides) have been drafted.<sup>8</sup>

The diversity of proceedings that can be initiated in order to protect against violations of all previously stated international treaties is great and includes different process mechanisms The most important are certainly international court and out-of-court proceedings, then international investment arbitration, as well as proceedings before national courts on the basis of general international jurisdiction.

In addition to numerous differences, the common characteristic of these posts lies in a series of process and material obstacles that prevent effective protection. The development task of this area would therefore have to remove a number of obstacles and expansion to a circle of persons that could be holders of some authority of importance for environmental protection.<sup>9</sup>

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<sup>7</sup> Centar za životnu sredinu, tehničke propise, kvalitet i društvenu odgovornost „Zelena agenda za Zapadni Balkan“, Beograd 2020, 1.

<sup>8</sup>Lista objavljenih CIS Guidance (CIS – VODIČA) <https://circabc.europa.eu/ui/group/9ab5926d-bed4-4322-9aa7-9964bbe8312d/library/a3c92123-1013-47ff-b832-16e1caaafc9a> 12.08.2022. god.

<sup>9</sup> Rodoljub Etinski, Maja Stanivuković, Sanja Đajić, Petar Đundić, Bojan Tubić, „Savremeni trendovi međunarodnopravne zaštite životne sredine“, Beograd 2017, 294.

## 1.2. Internal law

Along with the norms of ratified international contracts, this concrete part of the law is regulated by the Constitution, laws and bylaws. It gains its place in the law of the SFRY Constitution as early as 1963, establishing the competencies of federation bodies in the adoption of basic laws on land, forests and waters. Over time, the subject of protection of the right to a healthy environment begins to extend beyond the framework of guaranteed rights, as confirmed by Article 192. of the SFRY Constitution of 1974. This is also the very beginning of the constitutional regulation in the world.

The very specific aspect of the law was also established by the applicable Constitution of the Republic of Serbia in 2006, in the section titled "Human and Minority Rights and Freedoms" under Article 74 of this Law. The necessity of protecting people's health, environment and natural resources can also lead to restrictions on certain constitutional guarantees, such as freedom of entrepreneurship, Article 83. or the freedom to use privately owned land article 88. Also very important is article 22. paragraph 1 of this Law. prescribes the right of everyone to judicial protection of human and minority rights guaranteed by the Constitution, while paragraph 2 of this Law establishes the right of citizens to contact international institutions to protect their freedoms and rights.<sup>10</sup>

The above mentioned articles of the Constitution constitutionally protect the case law at a principle level, and it was necessary to adopt the appropriate laws for their full realization. Certainly one of the most important legal acts in this area are the Law on Environmental Protection, the Law on Environmental Impact Assessment, the Law on Free Access to Information, as well as the Law on Land Protection, the Law on Air Protection, the Law on Waste Management and others. According to the list of environmental regulations in the Republic of Serbia, more than sixteen laws and an even greater number of accompanying regulations and regulations are in force.<sup>11</sup>

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<sup>10</sup> Ustav Republike Srbije, „Sl. glasnik RS“, br. 98/2006 i 115/2021

<sup>11</sup> Ministarstvo zaštite životne sredine, „Spisak propisa iz oblasti zaštite životne sredine u Republici Srbiji“, Beograd 2017, 2.



One of the most important laws for this publication is the Law on Water, which regulates the legal status of water, integral water management, management of water facilities and water land plots, sources and methods of financing water activities, supervision over the implementation of this law, as well as other issues important for water management. The provisions of this law refer to all surface and underground waters in Republic of Serbia, including thermal and mineral waters, with the exception of underground waters from which useful mineral raw materials and geothermal energy can be obtained.<sup>12</sup>

The criminal code also includes legal norms that protect the right of the subject in a group of environmental crimes and a group of crimes against the general security of people and property. It should be especially noted that our legal system traditionally recognises the possibility that legal entities are responsible for economic offences and violations (the responsibility of the collective), thereby meeting the requirements of EU legislation in this area. Although the right to a healthy environment, especially the right to water, is primarily protected by other branches of law, the criminal law in addition to applying where basic protection has not yielded satisfactory results, as the ultimatum must be able to perform the function of general overeating. However, although there are a number of examples of severe environmental pollution in practice, the application of criminal law in most cases omits, sending a questionable message to potential pollutants. Therefore, in order for the criminal law to achieve any effect and especially the appropriate outcome in the field of prevention, it must be consequentially applied.<sup>13</sup>

Based on the European Commission's 2021 report, the emissions should be 1.5%. In 2013, Republic of Serbia achieved a moderate level of compliance with EU legal flows in the field of water quality. The problem marked the slow implementation of legal regulations, including work on an action plan for the realisation of water management strategies. The discrepancy with standards also applies to water quality, especially in the area of arsenic presence, which is a major cause for concern. Unpurified sewage and wastewater have been designated as a

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<sup>12</sup> Zakon o vodama, „Sl. glasnik RS“, br. 30/2010, 93/2012, 101/2016, 95/2018 i 95/2018 – dr. zakon

<sup>13</sup> Stefan Samrdžić, „Krivičnopravna reakcija u oblasti zaštite životne sredine“, Novi Sad 2011, 21.

main source of water pollution and highlights the need for a more rigorous approach to the problem of river pollution. The report also stresses that Republic of Serbia should redouble efforts to harmonise its legislation, particularly legal regulations related to environmental impact assessment, and to strengthen its administrative capacities at the central and local levels, including inspection and judicial authorities.<sup>14</sup>

A real challenge should be to refine existing and define new solutions that would lead to better law enforcement control by the environmental inspectorate. The work of inspection authorities would have to be effective and reliable with the aim of fully implementing legal acts. However, in practice the system of control of subject norms has proven inadequate, as indicated in the National Environmental Programme.<sup>15</sup>

Further development of this branch of law in the Republic of Serbia determines on the one hand the institutional capacity for policy reform and legislation in the area of environmental protection and harmonisation of legislation with EU legal standards in the area of environmental protection. Unfortunately, some of actions in the previous period not only have not managed to find solutions that would lead to better functioning of the system and more complete control over the implementation of valid norms, but also show a propensity for backward development in visible contradiction with international obligations and the very interest of citizens. The breadth and complexity of legal acts in this area sometimes seems pointless, because the vast "forest" of regulations and different criteria, without proper application in practice, has no special purpose for itself. In

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<sup>14</sup> Radni dokument komisije „Republika Srbija Izveštaj za 2021 godinu koji prati Saopštenje komisije upućeno Evropskom parlamentu, Savetu, Evropskom ekonomskom i socijalnom komitetu i Komitetu regiona; Saopštenje o politici proširenja EU za 2021. godinu“ SWD(2021) 288 konačna verzija, Strazbur 2021, 129.

<sup>15</sup> Mirjana Drenovak-Ivanović, „Zaštita životne sredine u zakonodavstvu i praksi“, Beograd 2015, 13.

this sense, it almost entirely affirms the rule that all regulations are only worth to extent to which they are actually applied.<sup>16</sup>

## **2. POLLUTION OF THE HYDROSPHERE IN THE REPUBLIC OF SERBIA**

The basic indicators of quality, i.e. the degree of pollution of surface and underground water are physical (turbidity, color, taste, smell and temperature), chemical (alkalinity, hardness, dissolved gases, metals) and biological (microbiological indicators, degree of compatibility, degree of biological production) parameters.

The main sources of pollution that exert pressure on water quality can be classified according to the spatial method of creation and release of pollutants into:

- point (concentrated) in which polluting substances are released in a precisely defined place. Pollution from sewage systems and industrial plants represent the most significant point sources of pollution.
- scattered (diffuse) which include all other discharges of polluting substances into watercourses or soil, which then spread further spatially. These sources include households that are not connected to the sewage system, communal landfills and tailings, inadequate soil cultivation (application of nitrogen fertilizers) and others.<sup>17</sup>

In order to carry out the necessary measurements, a "monitoring" was established, however, the location of the measuring points, as well as the number and frequency of parameter measurements are not appropriate on all watercourses. A big problem is also taking into account only average annual values with an arbitrary choice of methods, tests and displayed results, which are used by certain polluters to release large amounts of harmful substances in a short period of time. If

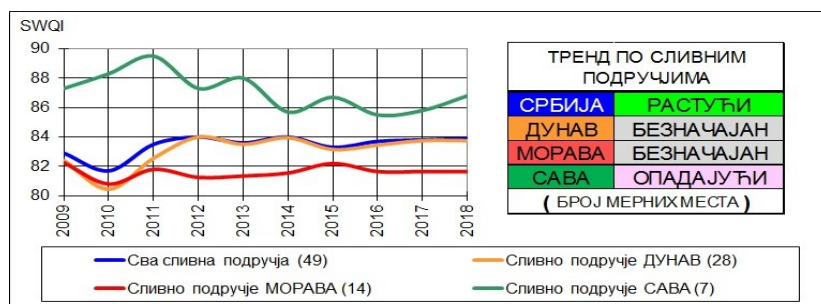
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<sup>16</sup> Milan Škulić, Aleksandra Čavoški, Danijela Trajković, Marina Matić, Vanja Mrakić, „Priručnik za zaštitu životne sredine“, Udruženje javnih tužilaca i zamenika javnih tužilaca Srbije, 121.

<sup>17</sup> Gordana Grujuć, Slaviša Perišić, Olivera Stanković „Vodeni reursi Republike Srbije – analiza stanja“, Beograd 2018, 31.

we add insufficient and uneven coverage of small and medium-sized watercourses, we get an incomplete and unreliable assessment of the quality of surface and underground waters.<sup>18</sup> A similar assessment was given by the European Commission in the Guidelines for the implementation of the Green Agenda for the Western Balkans, emphasizing the importance of investing in monitoring equipment with the comparative implementation of pressure reduction on water bodies.<sup>19</sup>

Given the state of "monitoring" described above, the supposedly good results presented in the Report on the State of the Environment in the Republic of Serbia, published by the Environmental Protection Agency, are not surprising. Namely, one of the most comprehensive methods in our country - the Republic of Serbian Water Quality Index (SWQI), which monitors water quality based on nine parameters of physical-chemical quality and one parameter of microbiological quality, shows a positive growing trend in water quality with the median moving in the interval from 80 to 90, which corresponds to "good" and "very good" quality.



**Figure 1.** Trends of median SWQI in the catchment areas of the Republic of Serbia (2009-2018) given on a scale from 0 to 100 so that 100 is the best quality.<sup>20</sup>

<sup>18</sup> Ibid.

<sup>19</sup> Radni dokument Komisije, „Smernice za sprovođenje Zelene agende za Zapadni Balkan uz saopštenje Komisije Evropskom parlamentu, Savetu, Evropskom ekonomskom i socijalnom komitetu i Komitetu regiona Ekonomski i investicioni plan za Zapadni Balkan“ {COM(2020) 641 finalni, Brisel 2020, 11.

<sup>20</sup> Agencija za zaštitu životne sredine, „Izveštaj o stanju životne sredine u Republici Srbiji za 2019. god.“, Beograd 2020, 57.

A similar display of the state is given for individual parameters. Nutrients such as Nitrates ( $\text{NO}_3\text{-N}$ ), whose source of pollution is leaching from agricultural land, and Orthophosphates ( $\text{PO}_4\text{-P}$ ), which originate from municipal and waste waters, also, according to the Agency's report, have mostly low concentrations. Nutrients can also be found in groundwater, which are slow renewable resources, and the consequences of their pollution are long-term.

Ammonium ( $\text{NH}_4\text{-N}$ ), as an indicator of possible bacterial activity of human and animal waste, records an insignificant median trend, while BOC-5 (biological oxygen consumption), as a basic indicator of surface water pollution with organic substances, has an insignificant trend in all catchment areas of the Republic of Serbia,<sup>21</sup> which is also in disagreement with the real situation on the ground and the data given on the number of wastewater treatment plants

What the water regime in Republic of Serbia counts as the most unfavorable in Europe lies in the incomplete sewage network with an insufficient number of collectors for wastewater treatment, as well as insufficient control of scattered (diffuse) emissions of polluting substances. In 2018, the percentage of residents connected to public sewerage amounted to 63%, of which the most were connected in the territory of the City of Belgrade and in Šumadija district, and the smallest in Zapadnobački and Nišava districts. However, according to the data from the same year, only 14% was treated for wastewater treatment, the most in the North Bačka region, 96%, while the Central Banat, Belgrade, Zlatiborska, Rasinska, Toplička and Nišava regions did not treat wastewater in the same period.

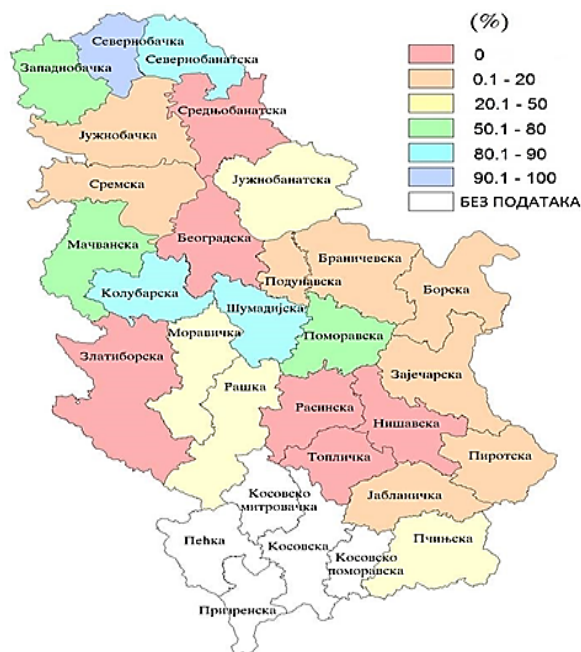
In addition to the fact that over the past few years, the percentage of residents covered by wastewater treatment has increased slightly, realistically speaking, it is still worryingly low. The statements coming from the Ministry of Environmental Protection are encouraging, stating that more than 120 cities and municipalities are implementing projects for the proper treatment of waste water.

Also, a small number of industrial plants treat their wastewater. If we add scattered (diffuse) sources of pollution that significantly affect the quality of surface water, underground water and soil to this description of the situation, we get a

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<sup>21</sup> Ibid. 49-52.

complete picture of the enormous pressure of pollutants on the quality of water in the Republic of Serbia. <sup>22</sup>



**Figure 2.** Wastewater treatment by regions for 2018. <sup>23</sup>

The amount of untreated wastewater averages an incredible 374.7 million cubic meters per year. In addition to the above substances, emissions of phosphorus (P), nitrogen (N) and heavy metals such as zinc (Zn), copper (Cu), chromium (Cr), lead (Pb), arsenic (As) and others often originate from point sources of pollution. The largest emitters of nitrogen and phosphorus in waste water come from PUC plants, especially from the Belgrade Waterworks and Sewerage with a share of 43%, followed by waste water from plants within the energy sector with a share of around 15%, then the chemical and mineral

<sup>22</sup> Mladi istraživači Srbije, urednica Milena Antić, „Poglavlje 27 u Srbiji – Napredak pod ključem“, Beograd, 2021 godina, 74-75.

<sup>23</sup> Ibid. 55.

industry.<sup>24</sup> It is necessary to implement adequate measures in the shortest possible time and to increase the number of wastewater treatment plants, but also to include systematic control measures of scattered sources of pollution, including protective or preventive measures in the areas where water and soil are most endangered.

As examples of the most polluted surface waters in Republic of Serbia, we can single out the river Pek, the Danube-Tisa-Danube canal, especially the Veliki Bački canal, which is also called an "open waste water collector" due to excessive pollution, the Bor river, known as the "Dead River" because it there are no traces of life, consequently Timok, Čelije lake near Kruševac and so on. Polluting substances from these waters are transported further, so, for example, nitrogen and phosphorus from the Veliki Bačka canal are transported to the Tisa and further to the Black Sea via the Danube.

Solid waste, which often ends up in the river from nearby landfills or tailings, is a big problem. Unfortunately, there are examples like this every year, we will only mention a part of the tailings pond in Leposavić of the "Trepča" combine, which, in addition to regular washing, fell into the Ibar in January 2021, bringing, among other things, huge amounts of lead and arsenic into the river. In addition, enormous quantities of plastic bottles, bags, tires, rusty barrels, household appliances and refrigerators covering the bottom and shores or floating in the Drina, Lim, South Morava and other rivers have been recorded several times.

The frequent occurrence of eutrophication, the overpopulation of aquatic plants, especially algae, in water reservoirs is caused by the high concentration of nutrients, phosphorus, organic matter, i.e. pollution originating from wild landfills, especially fecal waste from poultry and other farms, excessive agricultural activities with inadequate use of artificial fertilizers, etc. Water pollution affects the change in the bio-chemical regime and the natural state, which causes long-term consequences for ecosystems through the change of aquatic plant communities and the extinction of certain fish species. This is also contributed to by the appearance of numerous invasive species such as common roach, sunfish, American pygmy catfish, hypophthalmichthys and others that can live in water of somewhat poorer quality and that significantly hinder the survival of many other fish species. This

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<sup>24</sup> Agencija za zaštitu životne sredine, „Izveštaj o stanju životne sredine u Republici Srbiji za 2019. godinu“, Beograd, 2020, 73-76.

type of scattered sources of pollution especially endangers the branches of larger rivers, which disappear due to eutrophication, thereby endangering habitats for numerous species, starting with insects, fish, amphibians, and nesting and wintering birds of aquatic habitats.

Due to climate changes, the occurrence of dry periods is becoming more frequent, which, among other things, leads to a decrease in the water level to the extent of endangering the living world in it. Illegal drilling of wells at a depth of more than 200 meters contributes to this situation, which damages the water vessels from which the surface waters are fed. The example of Lake Čonoplja is perhaps one of the most dramatic. During 2022, the water level dropped to an incredible 20-30 centimeters in the deepest part, which endangered the entire fish stock of the lake. This problem has become visible on almost all river courses and already represents a huge challenge that will not be absent in the coming years.

This condition is accompanied by frequent fish kills. This year alone, large quantities of dead fish were pulled from the Tisa, Raška, Južna Morava, Nišava and other streams. High temperature, low level of oxygen in the water with reduced water level followed by the release of polluting substances in the short term, primarily from the food industry, leads to increasing losses of the fish stock.

We should not leave out the great pressure on small mountain watercourses due to the construction of a large number of small hydropower plants throughout Republic of Serbia, even in protected areas. The construction of small hydroelectric power plants has a particularly bad impact on the environment, as it leads to: changes in the morphology of watercourses, destruction of vegetation and soil in the coastal zone, disappearance of the ecosystem of the watercourse itself, impairment of the quantity and quality of underground water, which can lead to the complete drying up of small watercourses, endangering other plant and animal species and the destruction of the entire landscape. Also, there is a negative economic and social impact on the local community, while the energy obtained in this way is disproportionately small to the damage caused, which leads to the conclusion that the only benefit from such projects is for investors. 25

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<sup>25</sup> Gordana Grujić, Slaviša Perišić, Olivera Stanković „Vodeni resursi Republike Srbije – analiza stanja“, Beograd 2018, 31.



The condition of drinking water is also alarming. In 2018, only slightly more than half of the water supply systems in Republic of Serbia, 61%, had a good quality of drinking water in the physical, chemical and microbiological sense. Mostly, the measurements on the territory of AP Vojvodina showed bad results, which represents a significant problem that requires a comprehensive strategy. The most important thing is to solve the problem of water with arsenic first, and then water that contains increased concentrations of sodium and other substances that can endanger people's health. The most difficult situation is in Zrenjanin, where the ban on the use of drinking water has been in force since 2004. However, Zrenjanin is not an exception, the quality of drinking water is also poor in Subotica, Novi Bečaj, Bački Jark, Sirig, Temerin, that is, in almost every other place in Vojvodina.

Despite this situation, the percentage of residents connected to the public water supply is constantly growing in the period from 2000 (65.0%) to 2018 (87.9%).<sup>26</sup> There is an obvious difference in the degree of connection to the sewage system compared to the water supply system, especially in smaller settlements, which poses a great risk of groundwater pollution.

### **3. IMPROVING THE CONDITION (GREEN TRANSITION)**

Considering that we broke through the limit of acceptable environmental load with reckless actions, there is not much room left for further mistakes. That is why quick action is necessary, with the aim of finding and implementing mechanisms to stop further damage to the environment and improve the existing situation. The Republic of Serbia must develop its own growth strategy and transform itself into a just and advanced society with a modern and competitive economy based on efficient consumption of resources. In accordance with the EU strategy, we must preserve, increase and protect the natural capital and the health and well-being of citizens from risks related to the environment and the impact of the environment

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<sup>26</sup> Agencija za zaštitu životne sredine, „Izveštaj o stanju životne sredine u Republici Srbiji za 2019. god.“, Beograd 2020, 67.

on them.<sup>27</sup> The transition process must simultaneously follow economic and social developments with gradual development without creating sudden upheavals and crises in society. The success of this process depends on the expertise, efficiency and effectiveness of the administrative apparatus as well as the success in the field in the fight against crime and corruption. A healthy system is a prerequisite for fighting for a healthy environment.

As everything in nature is connected, solving the problem of enormous pressure on the water regime in Republic of Serbia must also include solving the problem of climate change, air pollution and soil pollution. After analyzing the state of the hydrosphere in the Republic of Serbia, we can conclude that immediate action is necessary to resolve the enormous pressure from scattered and point sources of pollution and to mitigate climate change. In order to realize these goals, it is necessary to take several steps.

Certainly, in the first place, all the decisions of the competent authorities that do not correspond to the assumed international obligations and thus to the goals of sustainable development and circular economy must be reviewed. It is necessary to reconsider and then amend all the acts that can lead to further degradation of the environment. Authorities must therefore shift the focus from effects to causes and apply the principle of prevention. In particular, the Spatial Plan of the Republic of Serbia from 2021 to 2035 should be considered and the given solutions brought closer to environmental protection and restoration, sustainable use of resources and better health of people.

The next step is to permanently increase budgetary investments in environmental protection. Any delay in such an approach is costly due to the resulting damage in the form of costs for future repairs of damage caused on the ground, greater pressure on the health system, unrealized profits from recycling, and more. Budget allocations in this field therefore do not represent an expense but a saving. Directing the budget to green priorities, with the gradual exclusion of harmful subsidies, plays a key role in achieving transition goals while ensuring economic growth. The allocated funds should be invested in strengthening the

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<sup>27</sup> Saopštenje komisije Evropskom parlamentu, Evropskom Savetu, Savetu EU, Evropskom ekonomskom i socijalnom komitetu i Komitetu Regiona – Evropski zeleni dogovor, CAO (2019) konačna verzija, Brisel 2019, 1.

financial capacities of central and local authorities, especially in the Environmental Protection Agency and inspection services.<sup>28</sup> The priority is certainly further investments in infrastructure, especially in the maintenance of existing ones and the accelerated construction of new water and waste water facilities while upgrading the system for monitoring based on needs mapping at the river basin level. In this way, the pressure from point sources on water bodies would be significantly reduced while enabling continuous remote monitoring of water quality and quantity.

Strategic investments should also include research activities with the application of innovative solutions in the field of water purification. Modern mechanization such as water drones, different boats for garbage collection, interceptors, barriers and suction baskets does not represent a large expenditure and can greatly contribute to a better condition on the ground.

The full effect of the increase in budget investments can only be realized through the strengthening of state administration and local self-government bodies, which is why it is necessary to carry out systematization, restructuring, training, and better control during employment. This is a complex process that requires the development of a special plan with constant monitoring of the results by an expert team. In addition to strengthening the efficiency, effectiveness and expertise of the state apparatus, it is also necessary to work on better transparency, which would additionally ensure better compliance with EU laws and standards and get better value for the money invested.<sup>29</sup> The strategic approach requires better coordination between the water management sector and the environmental protection sector with the development of cooperation with other relevant sectors from the fields of energy, agriculture, spatial planning, finance and others. This includes the establishment of constant communication, data exchange and coordinated action, which is why it is necessary to form a special intersectoral group. Along with this, it is necessary to strengthen the process of decentralization.

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<sup>28</sup> Radni dokument komisije „Republika Srbija Izveštaj za 2021 godinu koji prati Saopštenje komisije upućeno Evropskom parlamentu, Savetu, Evropskom ekonomskom i socijalnom komitetu i Komitetu regiona; Saopštenje o politici proširenja EU za 2021. godinu“ SWD(2021) 288 konačna verzija, Strazbur 2021, 129.

<sup>29</sup> Ibid.

In particular, the work of the inspection bodies would have to be more effective, thorough and reliable, with the aim of applying the legal and by-laws as fully as possible. However, in practice, the control system of the norms in question proved to be inadequate, which was also pointed out in the National Environmental Protection Program.<sup>30</sup> A large number of examples of heavy pollution can be determined on the ground, but the application of legal norms is still missing in most cases. This situation is confirmed by the report of the European Commission, emphasizing the role of inspection and judicial authorities in the application and enforcement of the first regulations. The work of the inspection authorities should especially contribute to the mapping of scattered sources of pollution, and therefore their remediation and punishment of those responsible.

Reducing the pressure on the water regime of the Republic of Serbia is extremely important, however, it is not sufficient in itself to solve all problems in the field of hydrosphere protection. Nature and processes in nature are interconnected and therefore we cannot approach any problem in isolation.

Climate change is one of the biggest challenges before us. Based on the data of the Republic Hydrometeorological Institute, in the period from 1951 to 2020, thirteen of the fifteen warmest years after 2000 were registered in Republic of Serbia. During the winter, the lack of prolonged retention of the snow cover became noticeable, except in the mountainous areas, while during the summer heat waves were more pronounced with the appearance of more and more intense forest fires. Due to climate changes, the occurrence of dry periods is becoming more frequent, which, among other things, leads to a drop in the water level to the extent of possible environmental disaster. Illegal drilling of wells at a depth of more than 200 meters contributes to this situation, which damages the water vessels from which the surface waters are fed. Ensuring water availability and resilience have already become a priority across Europe. The Law on Climate Change has been adopted, but it cannot be implemented without the adoption of a large number of supporting by-laws such as the Low Carbon Development Strategy with Action Plan, National Energy and Climate Plan, Nationally Determined Contributions and

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<sup>30</sup> Mirjana Drenovak-Ivanović, „Zaštita životne sredine u zakonodavstvu i praksi“, Beograd 2015, 13.

others.<sup>31</sup> Transitional processes in this area must begin immediately, while enabling systematic development and monitoring of economic and social developments, in accordance with assumed international and political obligations.

What can and must be done without delay is the improvement of forest areas in a quantitative and qualitative sense. Forests are of great importance because they represent the habitat of numerous plant and animal species, they purify the air, prevent soil erosion, have a favorable effect on the climate, purify and supply water such as springs and waterfalls, preventing rapid water runoff. Republic of Serbia has low forest coverage, the total area is about 2,252,400 hectares, which is far below the planned and necessary area in the current situation.<sup>32</sup> Huge areas are covered by coppice forests, while inadequate planning and use of privately owned forests is still an unsolved problem. During the previous period, there were no significant activities on the preparation and adoption of strategic documents, and there was also no significant progress in the implementation of the European regulations in the field of forestry, FLEGT and EUTR.<sup>33</sup> Considering this situation and the fact that every year there is enormous damage caused by illegal logging, natural disasters, damage from insects and plant diseases, it is necessary to establish better risk prevention with increased supervision and enforcement of regulations, and without delay to increase reforestation to ten thousand hectares per year with the goal of gradual growth.

Recycling and waste treatment also play a significant role in environmental protection as well as the establishment of sustainable development and circular economy. This is significant not only from the point of view of reducing the pressure on the quality but also on the quantity of water. If we exclude public water supply, the main pressure is water extraction for industry and agriculture. In order to improve the situation in this field, it is necessary to abandon the linear model of economic growth responsible for the uncontrolled consumption of resources and

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<sup>31</sup> Mladi istraživači Srbije, urednica Milena Antić, „Poglavlje 27 u Srbiji – Napredak pod ključem“, Beograd 2021, 140.

<sup>32</sup> Republički zavod za statistiku, bilten „Šumarstvo u Republici Srbiji, 2020.“, Beograd 2021, 18.

<sup>33</sup> Mladi istraživači Srbije, urednica Milena Antić, „Poglavlje 27 u Srbiji – Napredak pod ključem“, Beograd 2021, 156.

energy and the creation of a large amount of waste that is inadequately treated and disposed of. In contrast, the circular economy implies the circular movement of materials and their reuse, which drastically reduces the consumption of energy and water and significantly reduces the amount of waste.<sup>34</sup> The international obligations of the Republic of Serbia in this regard are determined by laws on the ratification of numerous international treaties and acts of a declarative nature, including the Declaration on the Green Agenda for the Western Balkans. In order to realize the assumed obligations within the given deadlines, it is necessary to speed up the implementation of legal regulations, further adoption of legal and by-laws along with the implementation of necessary measures in the field of introducing the concept of clean energy within the entire economy.<sup>35</sup>

Production, distribution and management of food and food waste stand out as processes with the greatest negative impact on the environment, more than all other human activities. The fact is that we have to eat, but the way we manage the food system has to change. In this way, the problem is determined more closely, and through further analysis, solutions can be sought at certain sub-levels, with the aim of achieving the desired result in the system, i.e. reducing pollution from a certain source.

Introducing belts of wild vegetation between cultivated areas would be a step in the right direction, as well as increasing restrictions on the sale and application of chemical agents in agriculture. Biodegradable waste from the food industry can be used as raw material for composting or biogas production. We can also use waste in the production of biodiesel, ethanol, organic acid, special types of oil, etc. This approach corresponds to a zero-emission model that strives for an integrated system in which residues are reused, recycled or recovered.<sup>36</sup>

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<sup>34</sup> Siniša Mitrović, Ivana Radosavljević, Milan Veselinov, „Cirkularna ekonomija kao šansa za razvoj Srbije“, Beograd 2020. godina, 12.

<sup>35</sup> Saopštenje komisije Evropskom parlamentu, Evropskom Savetu, Savetu EU, Evropskom ekonomskom i socijalnom komitetu i Komitetu Regiona – Evropski zeleni dogovor, CAO (2019) konačna verzija, Brisel 2019.

<sup>36</sup> Milan Jovanović, „Zaštita životne sredine u prehrambenoj inudstriji sa posebni osvrtom na zaštitu voda“, UDK: 664:502.51, BIBLID: 0352-3713 (2016); 33, (4-6): 32-47, 37.

This approach reduces costs and provides additional sources of income for business entities. The task of the state is to facilitate and encourage sustainable development through legal regulations and economic incentives, subsidies and development credits, while simultaneously introducing higher taxes, control and harsher penalties for polluters. Savings at the expense of the environment must no longer be the source of anyone's economic success, because it would mean the unethical capture of other people's income, necessary to restore the balance with nature, without which there is no future for humanity.<sup>37</sup>

## CONCLUSION

Based on the data presented, we can conclude that the level of pollution in the Republic of Serbia long ago exceeded the limit of acceptable environmental burden, therefore it is necessary to start with a professional and thorough solving of this problem as soon as possible. Certain measures such as further legal regulation, withdrawal of harmful decisions and infrastructural investments in the maintenance of existing and accelerated construction of new water and waste water facilities, as well as procurement of machinery and installation of a remote monitoring system must be implemented as soon as possible. At the same time, it is necessary to launch a more determined fight against crime and corruption, with the strengthening of inspection and judicial authorities with the aim of fully implementing the Law. The urgent improvement of forest areas in terms of quantity and quality is of essential importance due to their enormous importance in this field. Other processes that require a more gradual approach, such as the introduction of circular economy and sustainable development models, reform and strengthening of state administration and local self-government, with the encouragement of intersectoral cooperation and decentralization, must be carried out professionally, efficiently and effectively, while monitoring economic, social and social trends without creating sudden upheavals and crisis in society. Direction of the budget to green priorities, with the gradual exclusion of harmful subsidies, plays a key role in achieving the aforementioned transition goals and ensures

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<sup>37</sup> Slobodan Pokrajac, „Održivi razvoj i ekološka ekonomija kao poslovne paradigme“, Škola biznisa 4/2009,26.

economic growth. Any postponement of such an approach is expensive, and paradoxically, savings can only be realized through greater investments.

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