

Land4Flood conference
2 – 5 September, 2025



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Timișoara, Romania

LEVERAGING NATURE-BASED SOLUTIONS FOR RESILIENT LAND AND FLOOD RISK MANAGEMENT IN ANTHROPOCENE

2 - 5 September, 2025



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International Water Resources Association
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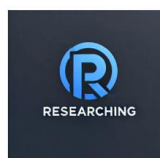
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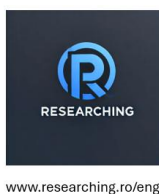
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Dr. Habil. Eng. Rareș Hălbac-Cotoară-Zamfir
Politehnica University Timișoara

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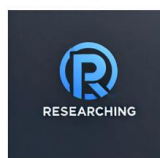
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NATURE-BASED SOLUTIONS IN SERBIA: ADDRESSING LEGAL AND IMPLEMENTATION CHALLENGES

Dr Sofija Nikolić Popadić¹

¹Research Associate, Institute of Social Sciences, Belgrade, Serbia

Email: snikolic@idn.org.rs

1. Introduction

The consequences of climate change have been increasingly visible in Serbia in recent years. From periods of drought and extremely high temperatures (the summer of 2024 was officially the warmest summer in Serbia since measurements began) [1,2], to highly intense precipitation. The amount of precipitation and its redistribution has changed over the years. The number of days with extremely heavy precipitation has increased by more than 5 times [3], influencing the risk of flooding, as it was the case in May 2014 when Serbia was hit by extreme floods [4]. The question is whether (and to what extent) Serbia is ready to implement nature-based solutions to cope with the consequences of climate change and to use them for flood risk management?

2. Methodology / Approach

The research primarily focuses on the analysis of policies, strategies, legal regulations and other documents in order to find answers to the questions of whether nature-based solutions are recognized within the relevant documents in Serbia and what are potential barriers for their implementation. We firstly detected documents which should contain nature-based solutions, taking into account the subject matter, the field they regulate and to which they belong. After that we searched for the term nature-based solutions in the documents. If we could not find the term nature-based solutions, then we searched for concrete measures which can be considered as nature-based solutions. In the final stage we analyzed if there are concrete instructions and procedures (in those documents) for implementation of nature-based solutions in practice. Based on the results of our research we detected problems regarding implementation of nature-based solutions and gave suggestions for improvement, especially regarding changes in legislation. In our research we analyzed: Law on Waters of the Republic of Serbia, Water Management Strategy of the Territory of the Republic of Serbia until 2034, Flood Risk Management Plan for the Territory of the Republic of Serbia for the period from 2021 to 2027, Law on Agricultural Land, Law on Climate Change, Climate Change Adaptation Programme for the period 2023-2030.



3. Results and Discussion

The research results show that the term nature-based solutions is not recognized within the policies, strategies and legislation in Serbia, apart from the Climate Change Adaptation Programme for the period 2023-2030 which is the only document explicitly containing the term nature-based solutions. However, that does not mean that nature-based solutions do not exist, or that they are not suggested in the relevant documents. We draw the conclusion about nature-based solutions from the analysis of specific measures suggested within the strategies and legislation. The Law on Waters contain measures such as protection and improvement of natural retention areas, “cultivation and maintenance of protective vegetation, clearing of vegetation, weeding, terracing, raising orchards and artificial meadows, melioration of pastures, prohibition of unplanned plowing of meadows, pastures and uncultivated areas,” afforestation, use of agricultural and other land in accordance with the requirements of anti-erosion land management. “Owners and users of land in the erosion area are obliged to carry out works and undertake measures for protection against erosion and floods in accordance with the water management plan and the conditions for the use of the erosion area.” [5] Unfortunately the Law contains just the list of measures without concrete details on implementation. In the Water Management Strategy, it is foreseen to form the necessary “retentions on less valuable areas such as forest and agricultural land, to restore or expand natural retention areas (wetlands and floodplains) to maintain existing forests and to work on afforestation of new areas, especially in hilly and mountainous areas with high risks of erosion, to arrange parks and green areas in cities for the best possible infiltration of precipitation into the soil,” etc. [6] Flood Risk Management Plan prescribes measures which are mostly related to natural water retentions and measures against erosion. [7] Law on Agricultural Land also does not contain the term nature-based solutions, although agricultural land can be very significant for their implementation. Prescribed measures, such as “temporary or permanent prohibition of ploughing meadows and pastures and other land in order to turn them into arable land with annual crops; the introduction of crop rotation; method of tilling the soil against erosion” [8] etc. can be also beneficial for flood prevention, although the primary aim of the legislator was to protect agricultural land from erosion and flash floods. Law on Climate Change does not refer to nature-based solutions, but Climate Change Adaptation Programme for the period 2023-2030 does and has a special section *Climate-water-soil nexus and Nature-based Solutions*. Unfortunately, this special session just emphasized the importance of implementing nature-based solutions for climate change adaptation but without proposing specific measures. After analysis of the whole Programme we came to the conclusion that there are certain measures which can be considered as nature-based. They are connected to specific sectors like forests, green infrastructure in urban areas, measures for meadows and pastures, measures for preserving biodiversity, etc. [9] but they are formulated in the very general way.

4. Conclusions and Future Work

The research identified gaps that exist in the system, which limit the application of nature-based solutions. In general, the term nature-based solutions should be recognized within the policy documents and legislation. From our research we can conclude that some documents and laws do contain certain measures which are nature-based solutions, but there is lack of coordinated introduction of nature-based solutions in all relevant documents and legislation. In general, one of the important conclusions is that there is lack of legal regulation regarding implementation of nature-based solutions on privately owned land. Namely, strategies, policies, programs recommend measures which implementation can be easier on publicly owned land, but when it comes to private ownership that might be problematic. Serbian Constitution and different legislation such as Law on the Foundations of Property Relations allow for limitations of ownership right, but there is lack of coordination between the legislation which govern (or should govern) implementation of nature-based solutions and regulation which allow limitation of property rights. One of the ways to change these barriers for wider implementation of nature-based solutions is through changes of specific legislation like Law on Waters and Law on Agricultural Land. As it is already stated owners and users of land in the erosion area are obliged to carry out works and undertake measures for protection against erosion and floods, so similar model can be replicated in other areas as well. There is also space for changes in Law on Agricultural Land which already contain different measures which owners/users should implement/or should restrain from on agricultural land, but they are not prescribed as a way of flood prevention or climate change adaptation measures. In our research we suggested concrete changes in Law on Agricultural Land which should allow for wider implementation of nature-based solutions on agricultural land. This research showed that introduction of nature-based solutions requires coordination between different sectors, policy makers, legislators and practitioners for successful implementation of measures in practice.

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