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Groundwater and Ecosystems

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Introduction

Ecosystem-based adaptation (EbA) is the utilisation of biodiversity and ecosystem services as part of a larger adaptation plan to assist humans in adapting to climate change's negative effects. Climate change, people, biodiversity, natural resources, and ecosystem services are all intertwined in EbA. It comprises policies for adaptation as well as multi-level initiatives to reduce ecosystem vulnerability and boost resilience. EbA is a new adaptation approach that can be used to improve groundwater management in the long run. The overarching goal of EbA in groundwater management is to protect groundwater quantity and quality while also improving groundwater's function in ecosystem services for the benefit of current and future generations. As a result, it mitigates the effects of changing conditions on groundwater, such as, but not limited to. Adapted groundwater management and effective groundwater environment protection are both required for long-term groundwater use.

Groundwater dependent ecosystems are a subgroup of ecosystems that are strongly reliant on groundwater (GDEs). As a result, GDEs are more vulnerable to changes in groundwater supplies and contamination. The hydrological link and flows from (important) recharge sites to GDEs are thus critical for the long-term viability of GDEs. Understanding regional hydrogeology, the link between recharge and discharge areas to and within GDEs, and the degree of groundwater dependency of these ecosystems can all aid in making judgments about which adaptation strategies to prioritise. GDEs and their services should be protected in accordance with the law.

Description

Ecosystem services

Understanding groundwater in the context of its surroundings is therefore critical. The benefits that individuals receive from ecosystems are referred to as ecosystem services. The hydrological cycle and water availability are extremely important to most ecosystems. The availability and state of groundwater resources are thus directly and indirectly dependent on the ecosystem services delivered. Increased groundwater abstraction, contaminants, and climate unpredictability are all altering ecosystem function and, as a result, jeopardising the services these ecosystems supply. A holistic approach is required to adequately handle the issues of climate change and anthropogenic pressures on groundwater, ecosystems, and their services. Ecosystem-based adaptation (EbA) could be a promising method for such interrelated difficulties.

Approaches can give cost-effective security against hazards posed by a variety of factors. Natural infrastructure protection and preservation do not replace the need for manmade infrastructure; rather, they serve as a complement, amplifying the advantages of healthy, functioning ecosystems. To protect groundwater supplies and ecosystem services, a variety of EbA measures could be used. EbA measures can be implemented based on a specific ecosystem service, a segment of an ecosystem, or one or more ecosystems. It is critical to undertake an integrated vulnerability assessment on the ecosystem of interest in order to successfully implement and improve the effectiveness of EbA for groundwater management. As a result, it will identify the ecosystem's primary ecosystem services, threats, and adaptive capability. Critical zones can exist within an ecosystem.

Data on groundwater and surface water quality and quantity, as well as ecosystem data, were gathered from a variety of sources. The data was evaluated to determine which aquatic and groundwater-dependent ecosystems were related with groundwater. Chemical time series data was evaluated and compared to the Croatian water quality standard's national recommended levels. Analyzing the aquifer hydrogeological parameters, as well as the position of the pumping site in respect to the ecosystem, the pumping rate, and groundwater level or discharge, the influence of groundwater abstraction on the groundwater-dependent ecosystem was addressed [1-5].

Conclusion

Karst poljes are ecologically significant and hydrogeologically complex karst occurrences. There are fourteen main karst poljes in the Dinaric area of the Republic of Croatia, ranging in altitude from 250 to 700 metres. They are usually morphologically parallel to the Dinaric strike of geological formations (northwest–southeast) and located between the same strike's mountains or mountain ranges. The existence of springs on one side of the polje and swallow-holes on the opposite side distinguishes karst poljes. Springs can be permanent or intermittent, and they are fed by upstream mountainous areas, which are usually characterised by increased rainfall. These springs' water generates watercourses that flow to the opposite, somewhat lower, side of the land, where it sinks beneath.

Conflict of Interest

None.

References

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