

Editorial: Effects of Land Use on the Ecohydrology of River Basins in Accordance with Climate Change

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A total of nine original publications and one concept paper are included in this Special Issue on water management and land use. Research topics include desertification in the Mexico Valley, the evaluation of environmental conditions and chemicals in Lithuania's water supply, and land use changes in the Polish mountains. This Special Issue also discusses climatic and anthropogenic factors that influence the Yangtze River in China. Similarly, the article on the Yellow River catchment fits quite well within Land's scope.

Climate change has changed the precipitation phase in Europe. More rain and less snow are likely to be experienced in winter. Snow replenishes groundwater resources that feed aquatic ecosystems (rivers, reservoirs, lakes) and water-dependent ecosystems (wetlands, marshes, and peatlands). Consequently, water shortages could arise and worsen as a result of a lack of snow or increased variability and intensity of precipitation. A variety of economic sectors and agriculture systems need to be properly managed.

Waterways with altered morphology must be revitalized or rehabilitated in order to restore their natural corridors and connectivity with river valleys. Groundwater retention capacity and restoration are also affected by such activities. Biodiversity enhancement, with an ecohydrological system, warrants climate change adaptation.

As an alternative to renaturation measures, the development of small, flowing water reservoirs could be a viable solution for floodplain and river banks morphology (straightened, staggered, and connected with groundwater). It is important to focus on high-quality, reusable retention water. Ecohydrological studies improve the quality of water and the environment by integrating biological indicators and hydrological process. Nature-based Solutions to water management are environmentally friendly.

1. Water Management in Rural Areas

Water retention has been greatly reduced in recent decades as the hydrological system has been remodelled to favour runoff rather than storage [1]. In agricultural areas, overdeveloped drainage channels, as well as flood protection measures, such as building dikes and straightening rivers in response to heavy rain, increase water loss. The sustainable development of catchments depends on preserving, protecting, or restoring natural watercourses [2].

Water management must integrate surface and groundwater resources, water quality, and reuse with environmental concerns [3]. Extreme weather phenomena limit the resilience of hydrological systems. Water deficits can be reduced more frequently, and

Citation: Halecki, W.; Bedla, D.; Ryczek, M.; Radecki-Pawlik, A. Editorial: Effects of Land Use on the Ecohydrology of River Basins in Accordance with Climate Change. *Land* **2022**, *11*, 1662. <https://doi.org/10.3390/land11101662>

Academic Editor: Nir Krakauer

Received: 20 September 2022

Accepted: 22 September 2022

Published: 26 September 2022

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the quality of the water might be improved simultaneously [4]. By integrating preventive steps, the hydrological buffer of the landscape would be increased, and more water could be retained. A rural landscape is designed to store water and maintain groundwater resources [5]. Generally, local water authorities and decision-makers have minor influence on social capital. Rural areas should, then, include the following [6,7]:

- Promoting activities to increase humus in soils (which has been decreasing steadily in recent decades);
- A buffer zone and rewetting should be maintained along river banks with pastures in river valleys;
- Improvements in selected drainage areas through redevelopment,
- Replanting trees in river valleys and groundwater supply areas.

2. Blue–Green Infrastructure in an Urban Area

Spatial planning should integrate green areas and urban structures to adapt to climate change [8]. Water retention measures should be created as an element of city planning activities (natural, semi-natural, and artificial areas). Blue–green infrastructure is undoubtedly an integral part of the built fabric (facilities combining greenery and water). In addition to significant negative environmental impacts (such as the desertification of water-dependent ecosystems, a decrease in groundwater-fed peatlands, the disappearance of alder and riparian forests), it has major economic and social consequences from an ecohydrological perspective [9,10]. The water quality of transformed rivers with a simplified biological structure and reduced ability to self-purify will be adversely affected by pollutants and elevated temperatures in the cities.

3. Conclusions

As a result of climate change, surface water quality may deteriorate and groundwater may become scarce. There are a number of meteorological factors, such as torrential rainfall, that can increase surface runoff, causing an accumulation of pollutants. An ecohydrologist explores both ecological processes and hydrological cycles. Studies and research in this field may be helpful in assessing environmental hazards. Climate change adaptation and mitigation can also be achieved through changes in land use, especially in river valleys. Small farms with hydrological-based production may also suffer from reduced productivity due to uncontrolled groundwater demand. Hence, groundwater exploitation requires monitoring and protection, which should set new standards for water resources. Nature-based Solutions can be the subject of further research with an emphasis on the eco-hydrological approach, especially in cities.

Author Contributions: Conceptualization, W.H. and D.B.; validation, M.R.; formal analysis, A.R.-P.; writing—original draft preparation, W.H. and D.B. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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