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Enlace de descarga

<https://doi.org/10.1016/j.scitotenv.2022.155968>

Science of the Total Environment 838 (2022) 155968

Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv

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HIGHLIGHTS

- The vegetation of high-altitude bofedales in the central Andes is a long-standing geobiosphere in the central Andes.
- The natural and the artificial bofedal show similar hydrological properties and ecosystem services.
- Soil organic carbon and soil water electric conductivity are related to plant species composition.
- High-altitude plant species show low correlation with environmental variables due to grazing.
- Artificial wetland creation enhances ecosystem services in a sustainable way.

ARTICLE INFO

ABSTRACT

High-altitude wetlands of the Central Andes, locally known as bofedales, provide important ecosystem services, particularly carbon storage, forage provisioning, and water regulation. Local communities have artificially expanded bofedales by irrigating surrounding grasslands to maintain pastures for alpacas grazing. Despite their importance, hydrological processes of both natural and artificial bofedales are still poorly studied, which hinders the development of adequate management and conservation strategies. We analyze and compare the vegetation composition, hydrological variables, groundwater chemistry, and soil characteristics of a natural and an artificial bofedal of at least 10 years old in southern Peru, to understand their interrelations and the consequences for ecosystem service provisioning. We do not find statistically significant differences in the soil, water, and

