



NATURE-BASED SOLUTIONS TO BIODIVERSITY PROMOTE **AND MITIGATE CONTAMINANTS (NATUREBIOPROMO)**

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Aquatic ecosystems are under increasing threat from human activity, particularly emerging contaminants (ECs). Conventional wastewater treatment plants (WWTPs) are often ineffective at removing these substances, meaning that treated effluents still contain trace concentrations (from ng/L to µg/L). Even at low levels, ECs can have a negative impact on organism growth, metabolism, reproduction and biodiversity. Although advanced treatment technologies such as oxidation processes and membrane filtration have shown promising removal efficiencies, their large-scale application is limited by high energy demands, elevated operational costs and the potential formation of toxic by-products. These limitations highlight the urgent need for innovative, cost-effective and environmentally sustainable solutions. In this context, nature-based solutions (NBS) emerge as a promising alternative, offering the dual benefit of mitigating ECs pollution while enhancing biodiversity and ecosystem services. The NATUREBIOPROMO project addresses this challenge by evaluating the ecological relevance and effectiveness of NBS in removing ECs from wastewater. The project involves seven institutions from South Africa, Brazil and Europe. Four case studies from three continents are being analyzed in a comparative study to evaluate the performance and adaptability of NBS in various environmental and socio-economic contexts. This transnational collaboration will enable the development of standardized tools and protocols with global applicability. Based on the results obtained from the screening phase for ECs in samples collected before and after the treatment systems from the research sites, a list of 33 compounds to be monitored in the various case studies was proposed, as their presence was detected in at least one sample. The list includes antibiotics such as sulfamethoxazole and clarithromycin, and metabolites such as N-acetyl-SMX. By improving biodiversity monitoring and ECs mitigation efficiency in various climatic and social settings, the project contributes to a better understanding of ecosystem dynamics and supports international environmental policy objectives.

Keywords: *Aquatic ecosystems; emerging contaminants; biodiversity*