Tropentag, September 11-13, 2024, hybrid conference

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Impact of multiple socio-ecological stressors in the Purnio river basin, Colombia

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Abstract

This study analyses the multiple lines of stressors affecting Central Colombia's Magdalena River and Purnio River. It provides a comprehensive overview of the current state of this socio-ecological system and connects it with the perceptions of the local population. Employing a multi-scale approach, this thesis investigates the hydro-morphological and abiotic parameters of the Magdalena River's tributary rivers, tracing their course from the tropical dry forest where the river originates to its confluence with the mighty Magdalena River. Cross-sectional analyses of hydro-morphological data of 28 sampling sites, collecting 89 abiotic samples. Additionally, 35 face-to-face interviews were conducted with the local people.

In the upper reaches of these rivers, the ecosystem remains remarkably pristine, characterised by an untouched river system with unhindered bed and bank dynamics. However, as one moves downstream, human settlements become denser, and expansive grazing and agricultural areas encroach upon the landscape. This shift brings an influx of sewage runoff into the river, severely limiting the river's natural dynamism.

As one travels along the river's course, abiotic data reveals a concerning trend: electrical conductivity and total dissolved solids increase as oxygen concentration decreases. Many of the regional population doubts the river's water quality, attributing it to cattle breeding, grazing, waste disposal, and wastewater discharge. These impacts were starkly evident during the field survey.

The findings of this research have significant implications for our understanding of river systems in tropical dry forests. They can serve as a valuable management tool, promoting the health of ecosystems and sustainable agricultural practices. Ultimately, these efforts contribute to preserving a healthy river system and maintaining good water quality, benefiting the environment and local communities.

Keywords: Abiotic data, water quality

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