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Participatory water resources monitoring as a science-policy tool: a decade of experience from the Andes

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background

Evidence-based decision making is seen as the key to sustainable water resource and catchment management. However, a major obstacle for evidence generation is the limited amount of data available from in-situ hydrometeorological monitoring. Monitoring is in decline globally, and this problem is particularly acute in high-elevation environments and in the tropics. Nevertheless, this situation also puts these environments in a promising position to study the potential of multi-source, polycentric generated information to tackle data scarcity.

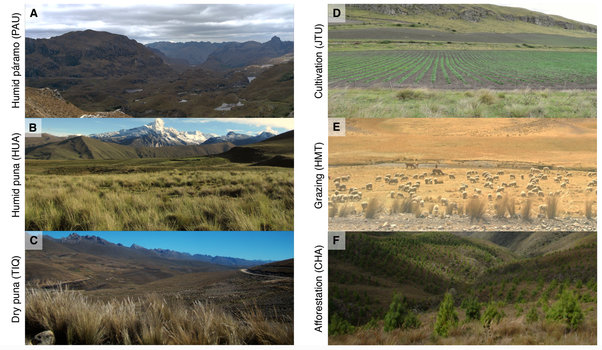


Fig 1. Ecosystems and common land-use types in the tropical Andes.

Regional Initiative for Hydrological Monitoring of Andean Ecosystems (iMHEA):

- Established in 2009. Over 18 stakeholders.
- Bottom-up partnership of academic and non-governmental institutions
- Network of >30 headwater catchments (< 20 km^2).
- Four major biomes: páramo, jalca, puna, and forest.
- >15 locations of the tropical Andes.
- Rainfall–streamflow monitored at high frequency.
- Involvement of local communities, governments, and research institutions.
- Network designed to characterize the impacts of changes in land use and watershed interventions on catchment hydrological response.
- iMHEA has started delivering fundamental information to guide processes of decision making more effectively and influencing policy-making on water resources at local and national scales.

trading space for time

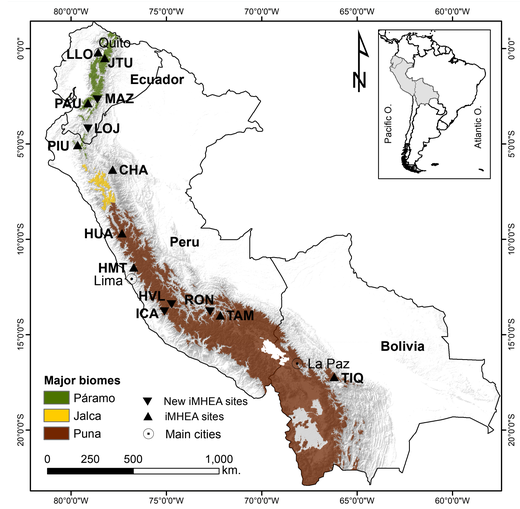
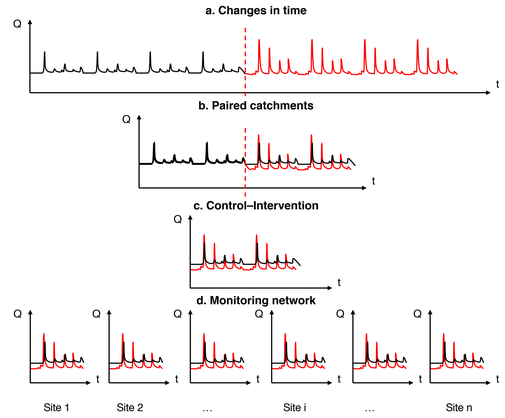


Fig 2. Location of the iMHEA sites and major biomes in the Andes.

Fig 3. Concept of "trading space for time".



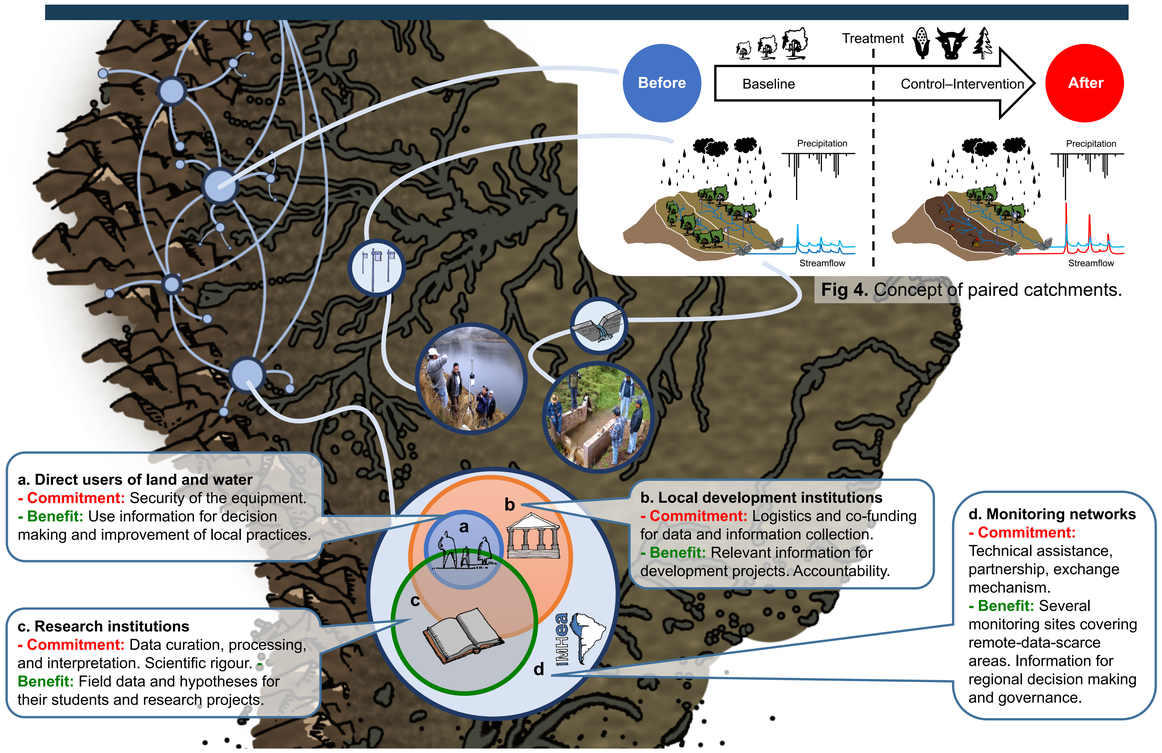


Fig 4. Concept of paired catchments.

highlights

- Participatory water resources monitoring can be seen a science-policy tool.
- iMHEA is currently one of the largest initiatives of grassroots and participatory environmental monitoring in the world
- There is no fixed common solution.
- The network emerged from a local awareness of the need of better information on ecosystem service management.
- "Low" entry threshold, accessible to local partners, ensuring quality through technical assistance and scientific advice.
- The participatory monitoring activities themselves have important local impacts.
- Observational data from experimental catchments have an essential value for hydrology and water resources management that increases with time.
- The long-term sustainability in the monitoring will allow a deeper understanding of current uncertainties, including seasonality, natural variability, environmental changes, and extreme events such as drought and flooding.
- There are still several challenges lying ahead.

contact and info

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SCIENTIFIC DATA

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Data Descriptor: High-resolution hydrometeorological data from a network of headwater catchments in the tropical Andes

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