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Integrating citizen science into local water management in Costa Rica

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Northern Costa Rica faces diverse environmental problems, including the contamination of surface and groundwater, which is partly caused by the intensive pineapple and sugar cane monocultures in this area. Together with poorly controlled and enforced environmental management mainly caused by a lack of monitoring data already triggered conflicts in local communities. However, the cost of traditional long-term water monitoring often prevents a sound data recollection, particularly in tropical, low-income countries like Costa Rica. Integrating citizen volunteers in water monitoring might be a promising tool to overcome these obstacles. The approach has been proven to be an effective tool for reducing costs and to directly share environmental responsibility, providing scientifically sound data and developing water management strategies.
In this study we involved citizens (CZ) in a collaborative water quality monitoring project in the Tres Amigos and Platanar River catchment (32 and 97 km2) in the north-east of Costa Rica to collect and store information using mobile technology creating a freely accessible and shared database. 22 kits for water quality (pH, Dissolved Oxygen, Turbidity, BOD, Nitrate, Phosphate, Temperature) monitoring (Lamotte GREEN Program Low Cost Water Monitoring Kit) were distributed to the CZ together with an intensive training of its use and accurate results interpretation. CZ were also trained in the use of the digital application to store and analyze the generated data linked to the geo-referenced monitoring site. The collected information can then be analyzed by the citizens themselves and scientists in relation to socio-economic, land-use and biophysical catchment characteristics. The latter generates a diagnostic of the current environmental state and trends of the study area.
The first records show some important temporal and spatial dynamics of water quality parameters. Even though the collected information remains semi-qualitative, this data can still enhance the environmental awareness of local actors for developing management strategies.