

An interactive system to map land degradation and inform decision-making to achieve Land Degradation Neutrality via convergence of evidence across scales: a case study in Ecuador

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Abstract

One of the core challenges to achieve Land Degradation Neutrality (LDN) is to spatially identify, and strategically prioritise, the areas to implement actions to avoid, reduce and reverse land degradation. To achieve this, a tool for a participatory and data-driven assessment considering both the biophysical, and socio-economic dimensions of land degradation across scales was developed for Ecuador. In this paper, we present the methodology and results obtained, including the spatially explicit interactive tool developed to integrate indicators that support the scaling-up of sustainable land management (SLM). The process involved specialists from various national and international institutions, as well as decision makers from the public sector and other relevant stakeholders. Cloud computing allowed the integration of five main sources of data: (1) the results of a participatory land degradation assessment based on an expert knowledge questionnaire following the Land Degradation Assessment in Drylands (LADA) and World Overview of Conservation Approaches and Technologies (WOCAT) methodology; (2) the Hand-in-Hand Initiative Ecuador typology maps based on poverty maps and estimated agricultural potential and efficiency scores using household surveys on agricultural production; (3) National data sets on land cover and land use, soil properties, and hydro climatic indicators; (4) global satellite-derived LDN indicators, such as Land Productivity Dynamics; and (5) Documented SLM practices from WOCAT Global SLM Database. The tool is based on a Google Earth Engine application and allows decision makers to easily compare results and obtain statistics at different spatial scales and landscapes, including 647 Land Use Systems delimited by experts. It also includes a multi-criteria module to identify areas with specific characteristics to prioritise different types of interventions to achieve the country's LDN targets. Convergence of local and global evidence allowed the identification of hotspots of degradation as well as areas of false positives/negatives - if only global or remote sensing indicators were considered. The participatory process contributed to strengthening multi-sector cooperation mechanisms and to guaranteeing ownership of the tool and the results. The system will support Ecuador's efforts to monitor and report progress towards LDN to the United Nations Convention to Combat Desertification. The system's code is shared as a repository at Earth Engine and can be adapted to and used by other countries and regions.

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