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SUSTAINABLE DEVELOPMENT CHALLENGES IN THE ECUADORIAN AMAZON: A CASE STUDY OF LAND USE AFFECT AND LANDSLIDE RISKS INDUCED BY A HYDROPOWER PLANT

INTRODUCTION



- Energy without air pollutants.
- Economic option for large-scale energy.
- Alter aquatic and terrestrial ecosystems.
- Harms biodiversity and water quality.
- Affects communities that depend on rivers.

OBJETIVE

Analyse land use and land cover (LULC) changes downstream of the CHCCS, using Sentinel-2 satellite images and spectral indices, to quantify the landslide areas around the Coca River tags.

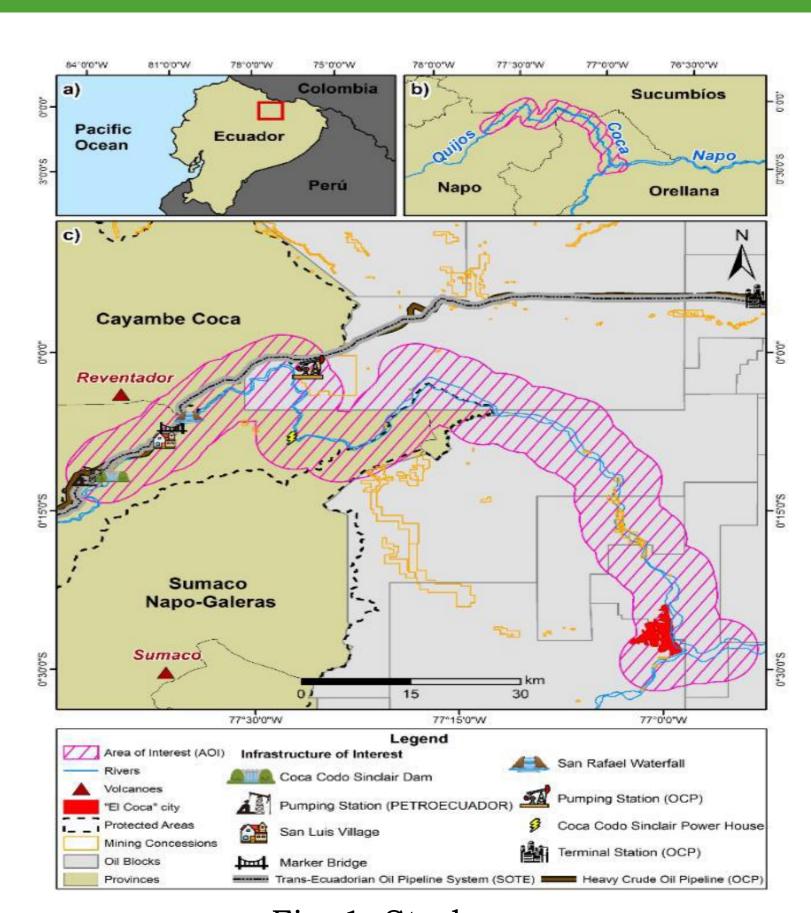


Fig. 1. Study area

METHODOLOGY

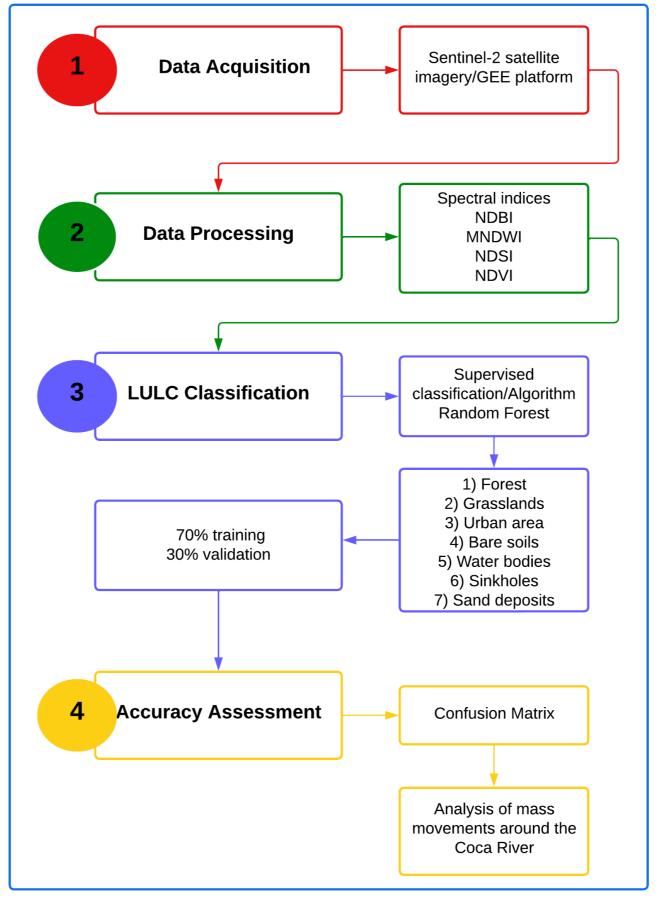


Fig. 2 Flowchart of the applied methodology

RESULTS

Table 1. LULC areas in AOI.

Class	Area [ha]	%
Forest	13247.43	78.68
Grasslands	1986.48	11.80
Urban area	269.86	1.60
Bare soil	212.33	1.26
Water bodies	519.70	3.09
Sinkholes	472.35	2.81
Sand deposits	128.40	0.76

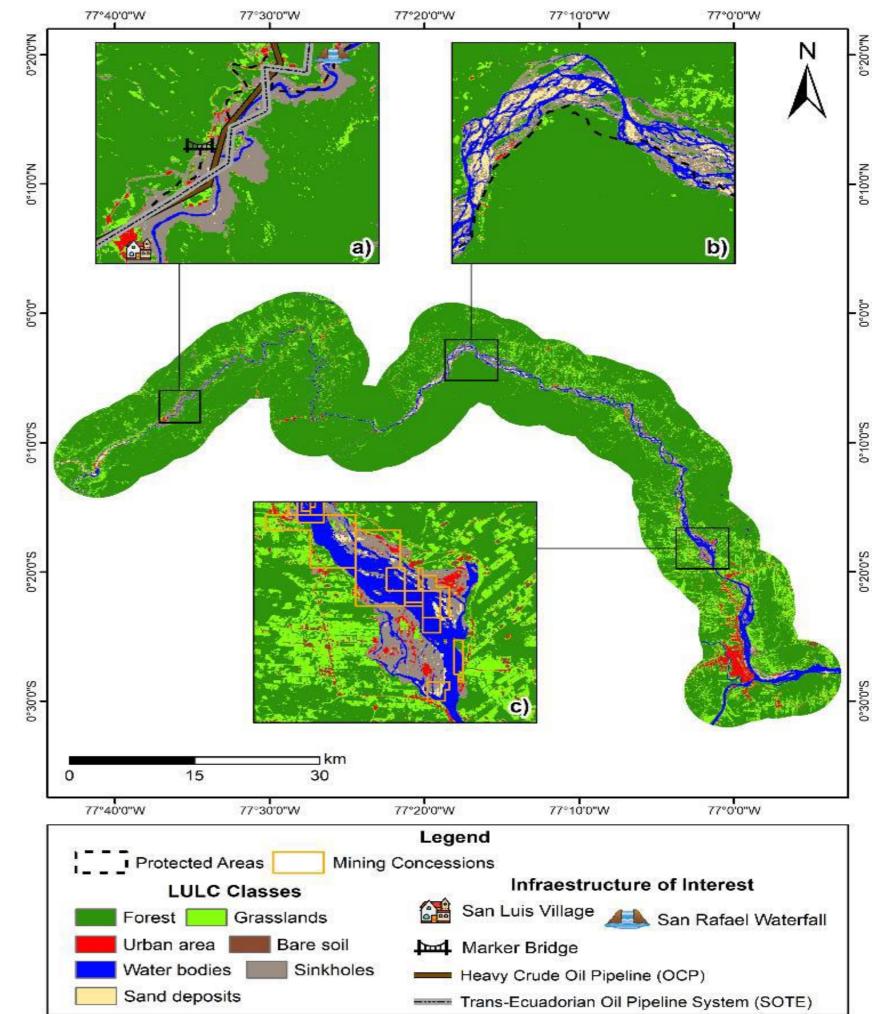


Fig. 3 Thematic LULC map

CONCLUSION

- NDVI, NDSI, and MNDWI revealed significant changes in the morphology of the Coca River.
- The mapping showed 473 ha of exposed soil linked to regressive erosion, and sediment transport altered the river's sinuosity (drift of 1.6 km).
- Hydroelectric construction in the Upper Amazon alters the river's natural flow, fragments landscapes, and degrades soil quality.



