

MAP OF AGRICULTURAL POTENTIAL IN BOLIVIA



Photograph: Joshua Woroniecki, Unsplash

The working paper asks where agricultural expansion in Bolivia is biophysically suitable and economically viable, and how this potential aligns—or conflicts—with environmental protection and land-use planning objectives. The core policy question is whether agricultural expansion can be steered toward high-potential areas to minimise deforestation and land degradation while supporting food security and economic development.

Authored by:

Summary report based on
SDSN Bolivia Working Paper No.
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Research and policy question

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Methodological approach

The authors combine geospatial analysis with agronomic and climatic data to construct a national-scale agricultural potential map that provides spatially disaggregated information. Two parallel processes are implemented. First, assuming that farmers are aware of which crops or livestock are most suitable for their local environmental and socioeconomic conditions, the most prevalent crop or livestock type in each municipality is identified, along with corresponding average yields and prices. Second, a high-resolution Production Cost Factor is developed based on physical conditions (e.g., slope, soil quality, precipitation, minimum and maximum temperatures) and legal constraints (e.g., protected areas, proximity to rivers). Together, these processes enable the generation of a map of net annual agricultural value per hectare.

Findings

The analysis reveals strong spatial heterogeneity in Bolivia's agricultural potential, with large areas of the country exhibiting low economic returns from agricultural use. The resulting map highlights that vast regions—particularly in the northern Amazonian department of Pando and in the Chaco and Pantanal regions—have limited agricultural potential, suggesting that forest-based and conservation-oriented land uses would generate higher overall social and environmental value. Despite this, even low agricultural returns can exceed the income typically derived from standing forests, as the sustainable extraction of timber or non-timber forest products is not widespread and most standing forest therefore provides little or no perceivable income. In the absence of effective land-use governance, this creates strong incentives for deforestation. These findings underscore the importance of incorporating spatial variability in agricultural potential into land-use planning and of strengthening policy mechanisms to align economic incentives with conservation objectives.

Policy implications

The results underscore the need for spatially differentiated land-use policies that account for large variations in agricultural potential across Bolivia. Areas with low agricultural returns—particularly in forested regions—are better suited for conservation-based and forest-dependent development strategies, as agricultural expansion in these zones yields limited economic benefits while generating significant environmental costs. In contrast, regions with high agricultural potential—many of which are municipalities where fruit crops and coffee are the dominant products—offer opportunities to promote agroforestry systems that combine high productivity with forest conservation. The findings also reveal a misalignment between private incentives and social value, where even marginal agricultural returns can outweigh income from standing forests,

encouraging deforestation in the absence of effective governance. Strengthening land-use planning, enforcement, and economic incentives—such as conservation payments, agroforestry support, or forest-based livelihood programs—is therefore essential to steer land-use decisions toward more efficient, climate-resilient, and sustainable development pathways.

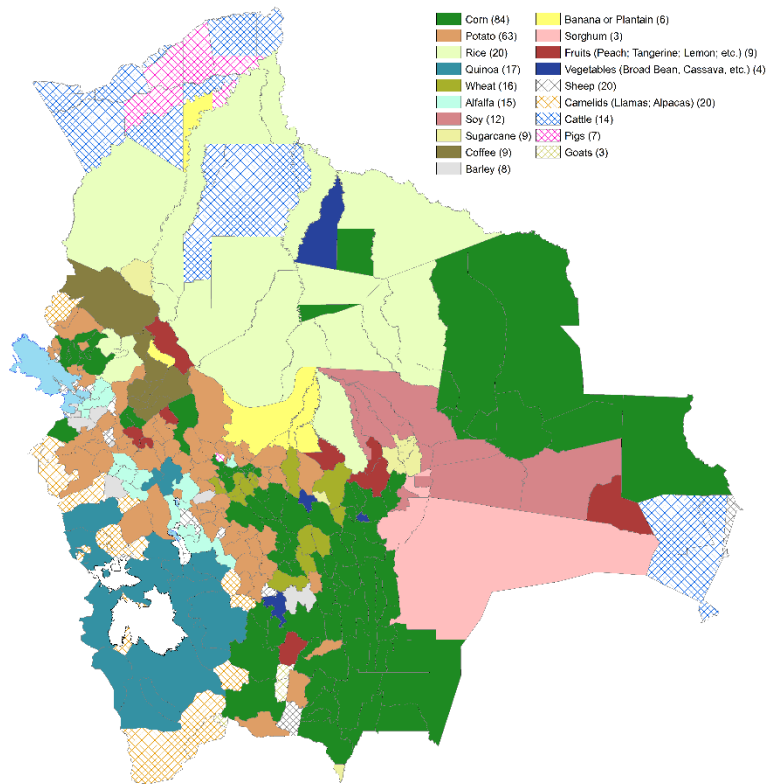


Figure 1. Main product by municipality

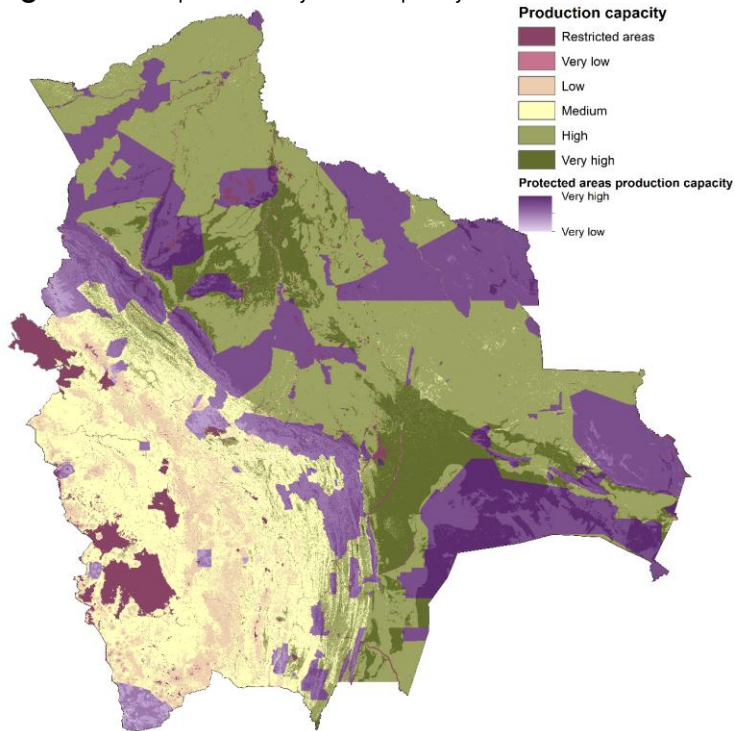


Figure 2: Pixel-level (30 m x 30 m) Production Cost Factor for Bolivia

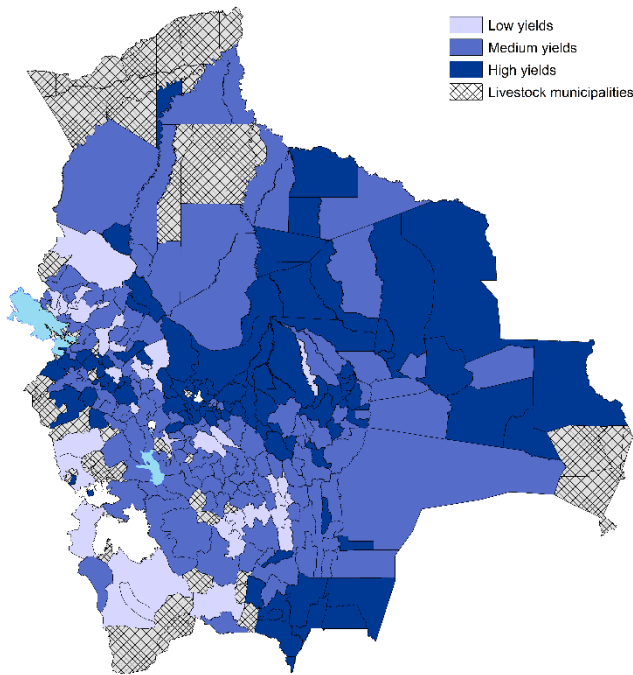


Figure 3: Crop yields by municipality

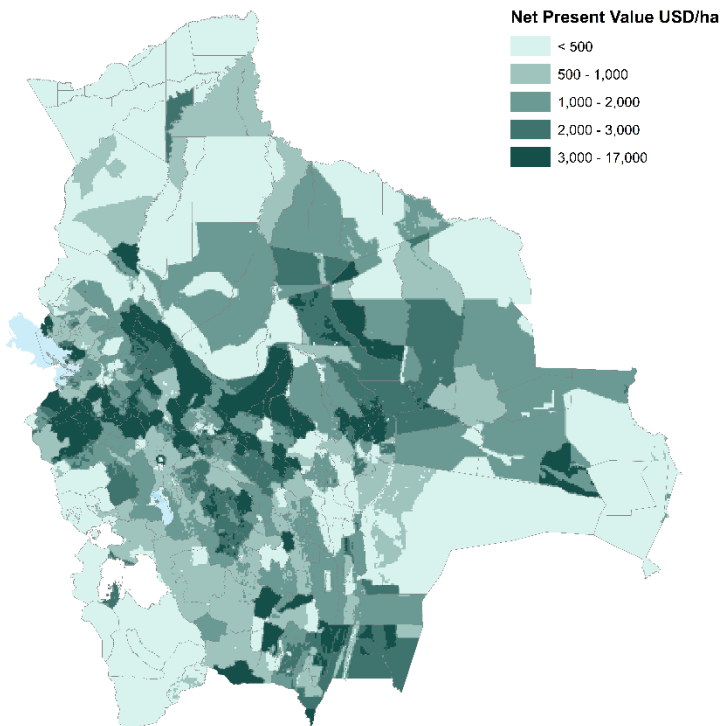


Figure 4: Net Present Value of Agricultural Production (USD/ha) - Agricultural Potential Map

Links and materials

- SDSN Bolivia (2023). Working Paper No. 5: Map of Agricultural Potential in Bolivia.
<https://sdsnbolivia.org/working-paper-n-5-2023-map-of-agricultural-potential-in-bolivia/>
- Full PDF report:
<https://sdsnbolivia.org/wp-content/uploads/2024/01/AgriculturalPotentialBolivia.pdf>

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