CGIAR MULTIFUNCTIONAL LANDSCAPES

The True Price of Plantain in Putumayo, Colombia

A True Cost Accounting assessment of the environmental and social externalities of smallholder production

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Background, objective and approach

Background and objective

- Plantain is a staple of Colombian food systems and, in Putumayo, is cultivated predominantly within smallholder, agroforestry-based systems on the Amazonian agricultural frontier.
- Market prices capture only the private transaction; the environmental and social costs of production are borne by society and remain external to the price.
- This study applies the True Price methodology to quantify and monetise these externalities for smallholder plantain and to identify their principal drivers.

Data and scope

274 producer households

268 hired workers

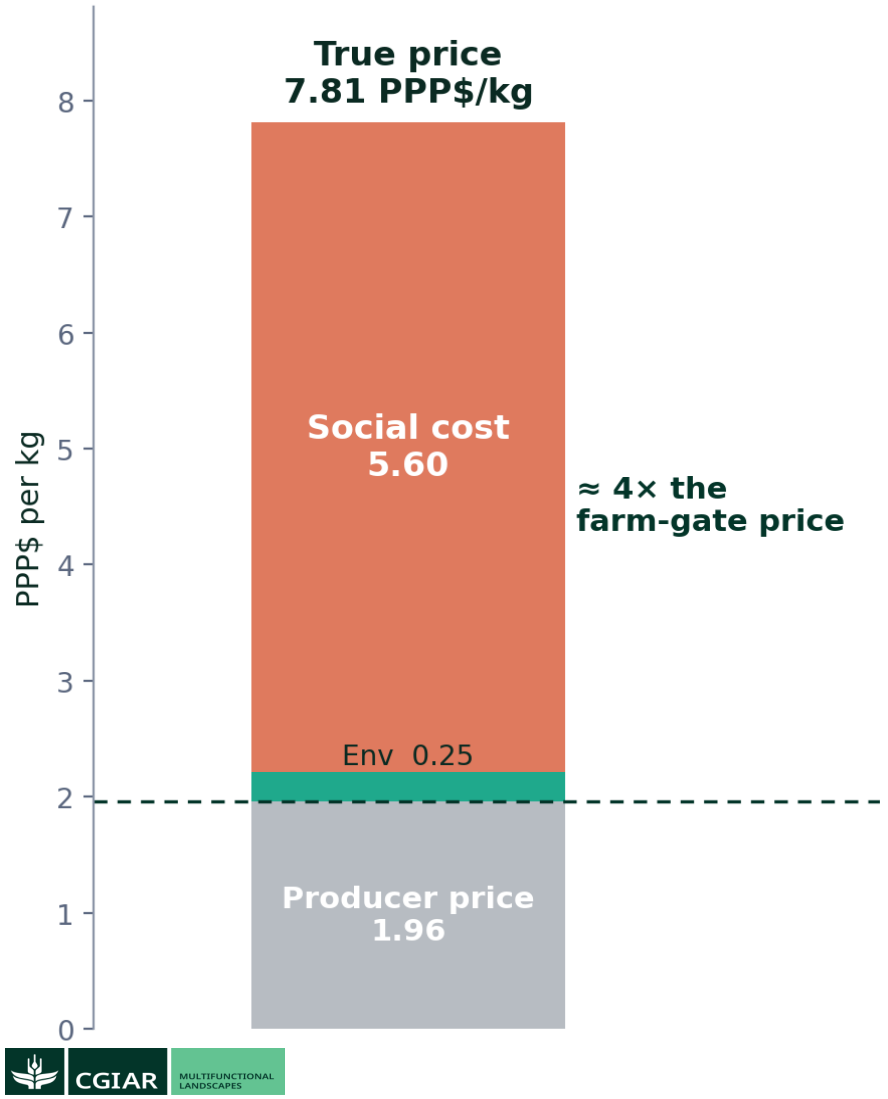
3 study municipalities

Producer and worker surveys across Mocoa, Puerto Asís and Puerto Guzmán;

Producer price + **Environmental cost** + **Social cost** = **True price**

Each impact is converted to a physical footprint and monetised with standardized True Price factors;

The true price gap of plantain



5.85 PPP$/kg

estimated true price gap — the external cost per kilogram, against a farm-gate price of approximately 1.96 PPP$/kg, giving a true price roughly four times the market price.

96%

social
of the true price gap

4%

environmental
of the true price gap

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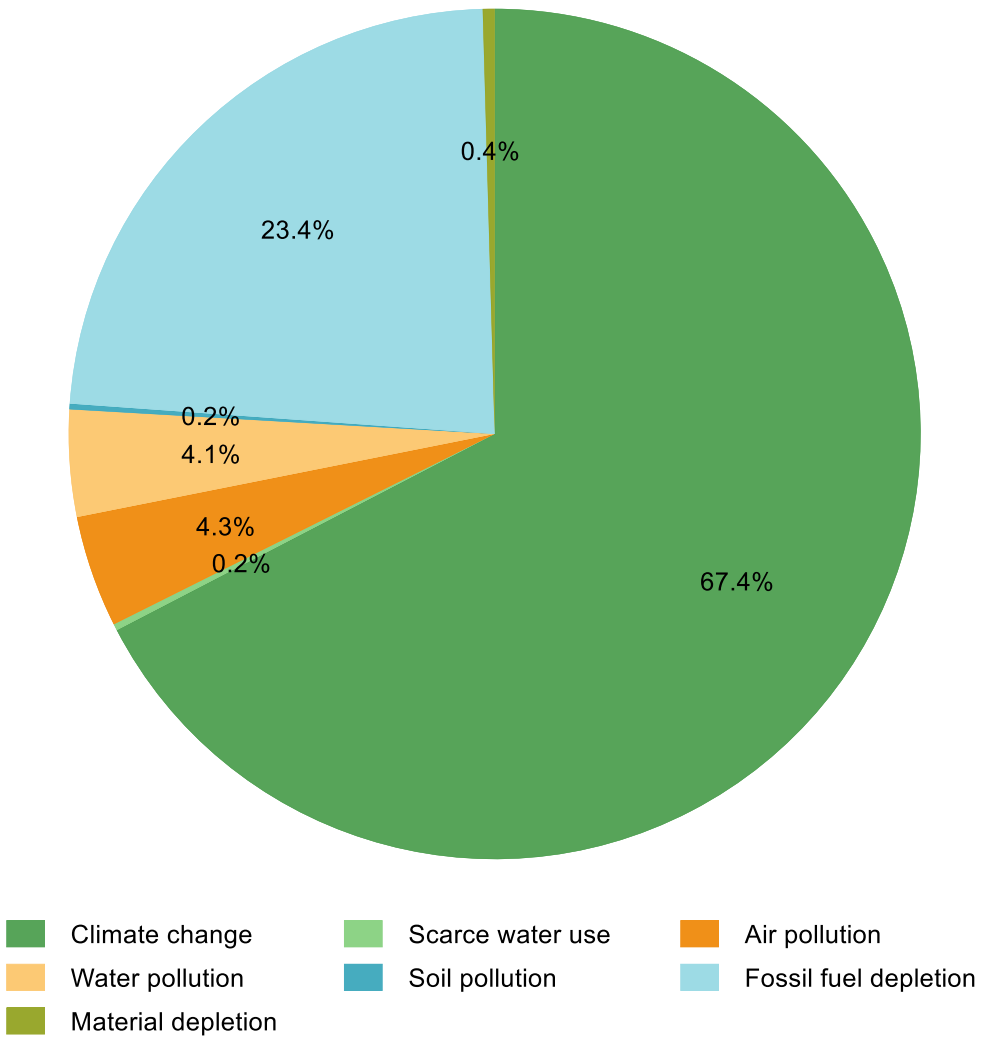
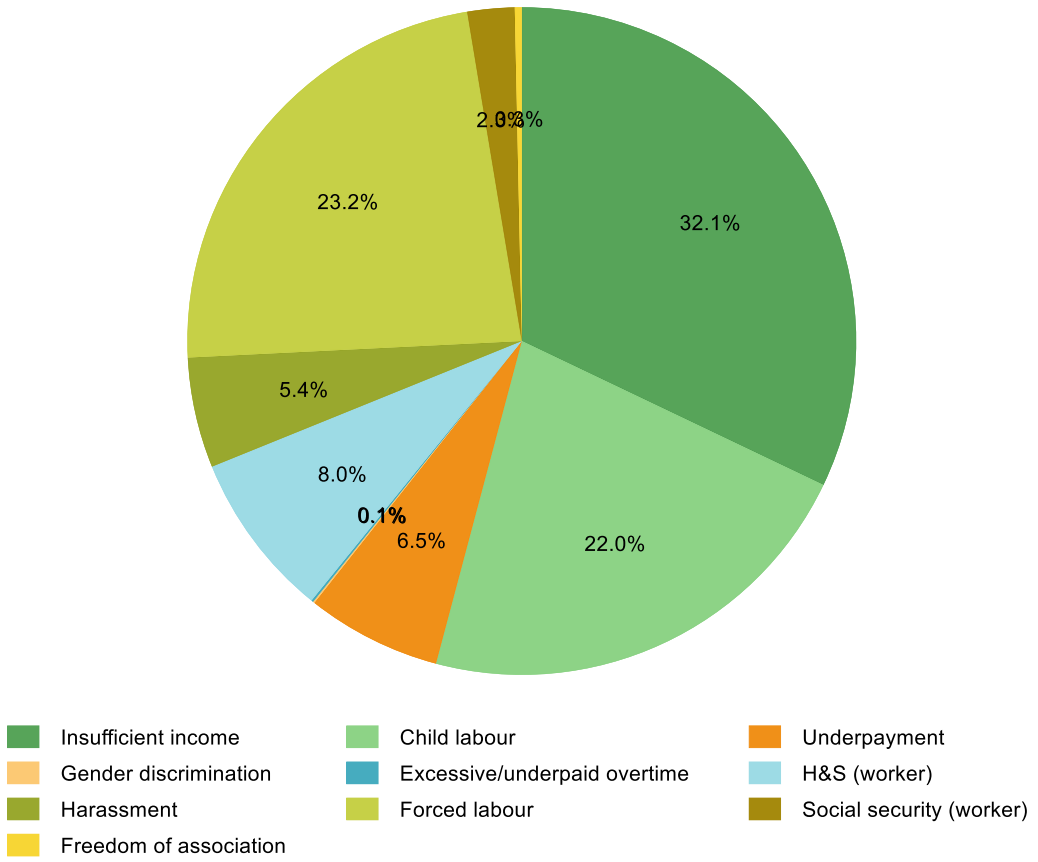
Environmental externalities

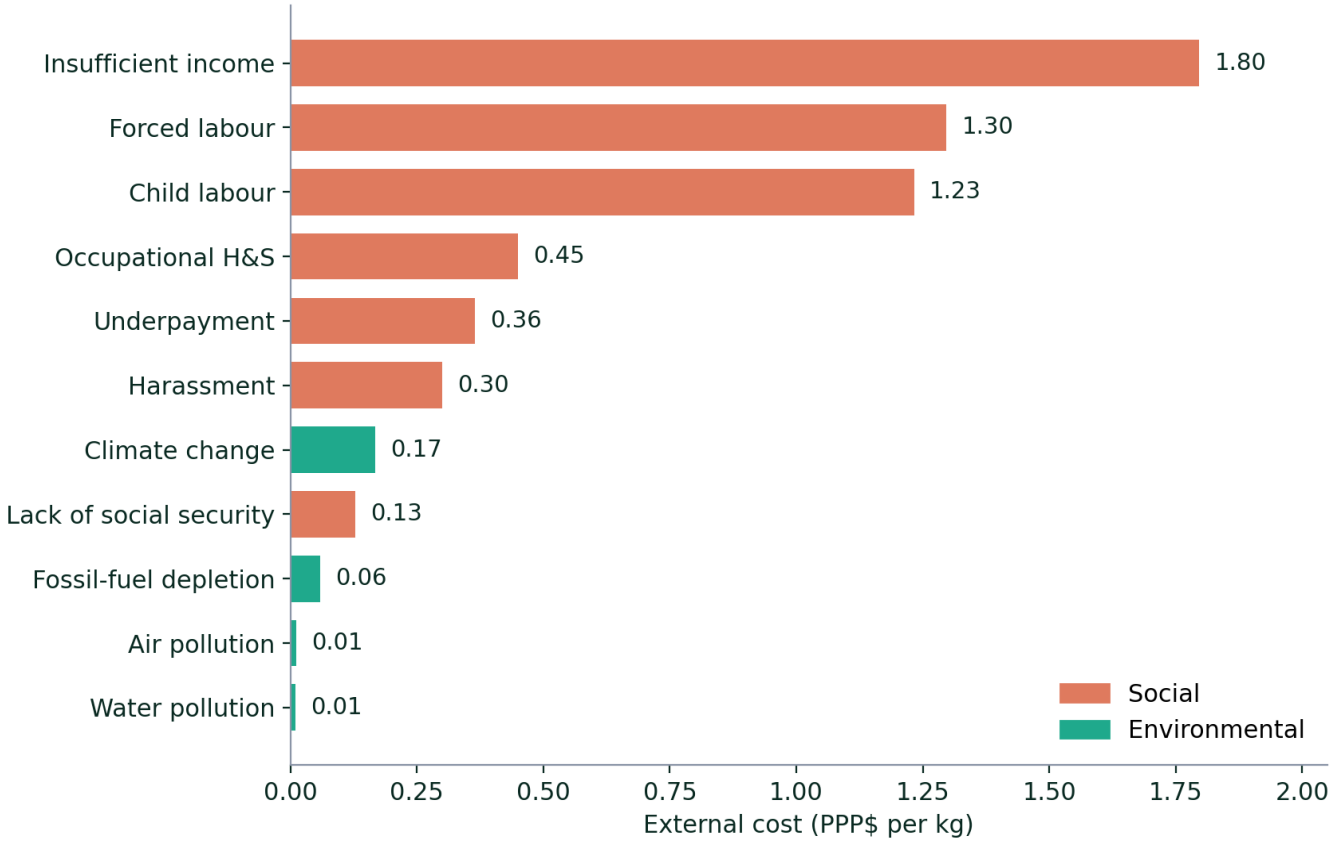


- The environmental external cost is estimated at 0.25 PPP$ per kilogram, consistent with a low-input production system.
- Climate change and fossil-fuel depletion together account for more than 90 per cent of it, reflecting limited agro-chemical use relative to more widespread on-farm fuel use.
- Given its small absolute magnitude, even substantial proportional reductions would have a limited effect on the overall gap.

Limitation. The footprint is input-based and excludes land-use change. Deforestation on the Amazonian frontier is the region's dominant environmental pressure and lies outside the assessment boundary; the small figure should not be read as evidence of overall environmental benignity.

Social externalities dominate the true price gap





Social impacts account for about 96 per cent of the true price gap. Insufficient household income (the living-income gap) is the largest single component, followed closely by forced labour and child labour; the largest environmental impact ranks below several social ones. The social cost thus reflects several interconnected dimensions of vulnerability rather than a single labour-market problem.

Interpretation: regional context and spatial variation

Consistency with the regional socioeconomic profile

44% rural monetary poverty in Colombia (2023), well above urban levels

≈53% Putumayo GDP per capita relative to the national average

≈87% of rural employment is informal, with agriculture the largest informal branch

Remoteness, poor transport infrastructure and dependence on intermediaries further depress licit farm-gate incomes in a historically conflict-affected department, conditions documented in region-specific work.

Spatial variation — true price gap (PPP$/kg)

Puerto Guzmán	**7.82**
Mocoa	**4.82**
Puerto Asís	**4.81**

The gap is highest in Puerto Guzmán, driven by social costs (child labour, underearning, underpayment); Puerto Asís carries the highest environmental cost.

Implications and limitations

Implications

- Reducing the gap depends primarily on raising net returns to plantain: productivity, a stronger position in the value chain and market access, and lower production and transaction costs.
- Labour conditions require distinct measures — formalisation and social protection, occupational safety, and safeguards against child- and forced-labour risk.
- The small environmental figure should not guide policy: forest conservation and land-use change, though outside the priced boundary, remain paramount.
- The heterogeneity across municipalities argues for place-based rather than uniform intervention.

Limitations

- The assessment is farm-level and input-based; it excludes downstream stages and does not value land-use change.
- The dominant social component is sensitive to the living-income benchmark and, as a per-kilogram figure over a low-yield crop, to output per household — affecting the magnitude, not the direction.
- Forced- and child-labour costs are best interpreted as an upper-range indication of risk; the gender wage gap is descriptive only.
- Monetisation requires normative choices, and the true price is a diagnostic rather than a price to be added to the crop.

Conclusion

Once producer livelihoods and labour conditions are incorporated, the external cost of smallholder plantain production substantially exceeds its market value. The binding sustainability constraint in this system is economic and social rather than environmental — while the small environmental figure reflects an on-farm input boundary that excludes land-use change.

