Effect of land reform and natural resource management (NRM) on environmental security

Watershed restoration initiatives have **large effects** on outcomes related to environmental security.

Geographical space: Sub Saharan Africa, Latin America and Caribbean, Global, South Asia, Middle East and North Africa

Effect: Large effect (g=0.908)

Confidence in study findings: Low (2 studies with 4 effect sizes)

Short Summary

Community-based watershed restoration initiatives, such as those in the Democratic Republic of the Congo (DRC), aim to improve environmental security and household economic stability through sustainable farming, reforestation, and Village Savings and Loan Associations (VSLAs). The intervention had large effects, with treatment watersheds showing increased tree cover, improved soil quality, and reductions in harmful agricultural practices such as burning fields for land preparation.

Long summary

The intervention

The intervention focused on community-driven watershed restoration in Eastern DRC, combining sustainable farming training, reforestation, and community forest management. Activities were implemented through VSLAs and partnerships with local institutions, including schools, churches, and mosques. The initiative sought to address environmental degradation, improve livelihoods, and strengthen resilience through local natural resource management.

How the intervention is expected to work

The intervention enhances environmental security by fostering community-led efforts to restore degraded landscapes, increase forest cover, and improve soil quality. Training in sustainable agriculture and environmental stewardship reduces harmful practices like slash-and-burn agriculture. Community participation builds ownership and responsibility, promoting better resource management and long-term resilience against environmental degradation.

The evidence base

This cell includes 6 studies: 2 impact evaluations, 2 systematic reviews, and 2 qualitative studies.

One of the reviews studies community-based forest management based on 69 case studies worldwide, while the other review had a specific focus of this topic in Indonesia.

The primary studies are from Eastern Congo (1), Israel and Palestine (1), and East Timor (1), Brazil (1).

Evidence findings

The intervention led to significant improvements in environmental security, including increased tree cover, improved soil quality, and adoption of sustainable farming practices. Households in the treatment area engaged more in environmental stewardship, contributing to better ecosystem health and reduced erosion. Despite these positive outcomes, environmental gains remain fragile, requiring sustained community participation and institutional support for long-term impact.

The review evidence

Community-based forest management initiatives generally improved environmental security, providing subsistence, savings, and income benefits across most case studies covered.

The impact evaluation evidence

There are two impact evaluations. Two study summaries are thus provided here:

Sabin (2019) evaluates the impact of a community-based watershed restoration initiative in Eastern Congo, assessing its environmental, economic, and social outcomes. Using a mixed-methods approach, including difference-in-differences (DID) analysis, participatory workshops, and remote sensing data, the study compares two watersheds—one receiving the intervention and the other serving as a control. The intervention involved establishing Village Savings and Loans Associations (VSLAs), promoting sustainable farming practices, and strengthening community leadership networks to encourage environmental restoration. Households in the treatment watershed planted significantly more trees ($p < 0.001$) and adopted sustainable farming techniques such as agroforestry and soil conservation ($p < 0.001$). There was a notable improvement in soil quality ($p < 0.001$) and crop diversity ($p < 0.001$), contributing to enhanced ecosystem health. Although remote sensing data showed an increase in vegetation cover, the difference between treatment and control was not statistically significant. The study is rated as medium due to its partial description of the evaluation questions.

Van Oel, Krol and Hoekstra (2007) examines the governance of water resources in the Jaguaribe Basin, Brazil, using common-pool resource (CPR) concepts to assess how water is managed in a semi-arid environment. The research focuses on rainfall variability, water storage, land use, and agricultural performance, highlighting the challenges of equitable and sustainable water allocation. Through an analysis of governance structures and human-environment interactions, the study finds that water resource management is highly asymmetrical, with upstream users disproportionately benefiting from water storage while downstream users face greater variability and scarcity. The study is rated medium confidence as it is a non-experimental study and due to its partial description of the intervention, outcomes, and evaluation questions.

Confidence Assessment

Overall low: The overall rating is low due to limited number of studies.

Link to review summaries

Harbi (2020)

Pagdee (2006)

All studies may be accessed via the EGM.

Other outcomes in the study:

Social cohesion / willingness to participate or help

Human security / economic security

Human security / food security and nutrition & health security

Human security / education security