

## **Effect of land reform and natural resource management (NRM) on economic security**

Land reform and natural resource management initiatives have **large effects** on economic security outcomes by improving tenure security, promoting long-term investments, and fostering financial stability..

Geographic region: Sub Saharan Africa

Effect: Large effect (g=0.207)

Confidence in study findings: Low (3 studies with 36 effect sizes)

### **Short Summary**

NRM and land reform interventions, such as Rwanda's villagization policy, Benin's land demarcation program, and community-based watershed restoration in the DRC, aim to secure land tenure, enhance resource equity, and promote sustainable agriculture. These interventions improved tenure security, encouraged long-term investments, and diversified household incomes, particularly through savings groups and local leadership initiatives. However, their impact on agricultural productivity and equitable access to resources varied, highlighting the need for context-specific designs and effective implementation strategies.

### **Long summary**

#### *The intervention*

NRM and land reform interventions target rural populations dependent on agriculture and natural resources. They include formalizing land ownership through Rural Land Use Plans (PFRs) in Benin, relocating communities under Rwanda's villagization policy, and implementing community-driven watershed restoration programs with Village Savings and Loan Associations (VSLAs) in the DRC. The initiatives seek to strengthen economic security by improving land tenure, promoting sustainable farming practices, and enhancing resource management.

#### *How the intervention is expected to work*

Securing land tenure incentivizes farmers to make long-term investments, such as planting perennial crops or adopting sustainable farming practices. By ensuring equitable access to land and resources, these interventions reduce disputes, strengthen resilience, and promote economic stability. NRM programs, including watershed restoration, enhance environmental sustainability and household income by improving agricultural productivity and diversifying livelihoods.

#### *The evidence base*

This cell includes 6 studies: 2 systematic reviews, 3 impact evaluation studies, and 1 qualitative paper.

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

The primary studies are set in Benin (1), DRC (1), Rwanda (1), Middle East (1, Israel & Palestine).

### *Evidence findings*

Strengthened land tenure and NRM initiatives promoted investments in sustainable agriculture and improved economic resilience. Rwanda's villagization reduced land disputes and enhanced access to public services, though agricultural productivity outcomes were mixed. In Benin, land demarcation increased perennial crop cultivation and soil conservation, particularly among women, with modest short-term productivity gains. Across West Africa, land titling improved tenure security and incentivized investment, though socio-cultural barriers limited productivity impacts. Overall, land reform and NRM interventions generally have positive effects on economic security, albeit influenced by implementation challenges.

### *The review evidence*

Community -based forest management showed positive impacts on economic security, particularly through subsistence, savings, and income generation. Success factors highlighted included tenure security, the socioeconomic boundaries of resources, and the expectation of benefits among participants.

### *The impact evaluation evidence*

There are three impact evaluations included in this cell. Three study summaries are thus provided here:

**Goldstein (2015)** This study examines the effects of the *Plan Foncier Rural* (PFR), a land formalization program in rural Benin aimed at improving tenure security and stimulating agricultural investment. The intervention includes community-led land demarcation through socio-legal studies, systematic topographic surveys, and marking parcel boundaries with cornerstones. Demarcation activities are intended to resolve land disputes and prepare for land certification. The study is a large-scale randomized controlled trial conducted in rural Benin, covering villages selected for land registration. The study findings that treated villages showed a 27 percentage point increase in the likelihood of delineated parcels, translating into a modest but significant 4 percentage point improvement in perceived tenure security. The program induced a shift toward long-term investment, with treated parcels 1.7 percentage points more likely to have newly planted trees (a 50% increase from the control mean). A temporary contraction in land rental markets was observed, with a 1.6 percentage point decline in parcels rented or sharecropped out, representing a 25% drop relative to control parcels. This is attributed to landowners reclaiming parcels to secure rights before certification. While the intervention spurred long-term investment, there was no immediate increase in agricultural productivity. The study is rated medium Confidence quantitative study due to attrition rate

**Kondylis (2008)** Rwanda has experienced recurring waves of ethnic violence since 1959, leading to massive population displacements and land shortages. In 1997, the Rwandan government implemented the *imidugudu* or villagization policy to address land disputes, enhance security, and improve agricultural productivity by resettling displaced returnees into agglomerated settlements and redistributing land outside these settlements. The study leverages data from the 2000/2001 National Rwandan Enquête Intégrée des Conditions de Vie des Ménages (EICV) and a concurrent Community Survey, examining over 6,400 households across Rwanda. Returnees

were randomly assigned to program villages, and the analysis uses geographic variation in policy implementation and a difference-in-differences approach. The study finds that the *imidugudu* policy significantly increased access to land for returnees in policy areas, though the effect diminished when regional disparities were controlled. Seed consumption was higher in policy areas, but the causality of this relationship remains unclear. Displacement negatively impacted on-farm labor participation, but the villagization policy mitigated this effect for returnees in policy areas. However, controlling for regional and household characteristics nullified these effects. Agricultural productivity showed mixed outcomes; while inputs like land and seeds had variable returns, overall output was lower for returnees in policy areas. The interaction between policy and returnee status often resulted in reduced efficiency in agricultural input utilization, particularly in seed returns. The study is rated low due to lack of reporting on attrition.

**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 experienced significant economic improvements, with an increase in savings habits and amounts saved per household ( $p < 0.001$ ). There was a diversification of income sources ( $p < 0.001$ ) and an increase in cell phone ownership ( $p < 0.001$ ), reflecting improved financial stability. Households reported an increase in investment in education, with a higher proportion of girls attending secondary school ( $p < 0.01$ ). The study is rated low due to lack of reporting on attrition-

*Confidence Assessment:*

Overall low: The cell is rated low due to a limited number of studies.

*Link to review summaries*

Pagdee (2006)

Harbi (2020)

All studies may be accessed via the EGM.

**Other outcomes in the study:**

Social cohesion / willingness to participate or help

Human security / education security

Human security / food security and nutrition & health security

Human security / environmental security

Community and state governance / access to justice, rights, and public services