

Land reform and natural resource management (NRM): row summary

Land reform and NRM interventions lead to large improvements in environmental and several human security and social cohesion outcomes, but little or no measurable reduction in violence or interstate diplomatic relations, and governance risks when information is provided only to local leaders.

Land reform refers to policies and interventions that change how land is owned, accessed, used, or governed, with the aim of improving equity, productivity, and social stability. It is most commonly pursued in contexts where land distribution is highly unequal, land tenure is insecure, or land-related disputes contribute to poverty and conflict.

NRM refers to efforts made to strengthen state or community-level management of natural resources, including water, rangelands and forests. This may include participatory management of irrigation systems, water user associations, rangeland/forestry user associations, crop substitution or climate adaptation and/or mitigation. Interventions to support community-based natural resource management groups can comprise elements of conflict resolution training.

The evidence in the included studies covers several types of land reform and NRM intervention. Under land reform are: (1) tenure and land administration reforms formalizing property rights and demarcating parcels; and (2) participatory mapping to document customary lands. NRM interventions in the included studies are: (1) community-driven watershed restoration combining sustainable farming training, reforestation, and local forest management, often bundled with Village Savings and Loan Associations; (2) information and deliberation campaigns on natural resource governance around major discoveries; and (3) cooperative institutions for shared resources, including water treaties and regional economic institutions, sometimes linked to conservation area management.

These approaches aim to reduce conflict risks by strengthening predictable and equitable rules for access to land and resources, and by creating incentives for stewardship and collective action. Tenure security and clearer boundaries can reduce appropriation and disputes and support long-term investment. Livelihood and savings components can increase household resilience and reduce scarcity-driven tension. Information and deliberation are intended to counter elite capture by increasing citizen knowledge, voice, and demand for accountability. Shared-management institutions and cross-border cooperation can provide platforms for dialogue and joint problem-solving, but may have limited effects where political exclusion, power asymmetries, or pre-existing hostilities remain unaddressed.

Land reform and NRM interventions lead to large improvements in environmental and several human security and social cohesion outcomes, but little or no measurable reduction in violence or interstate diplomatic relations. In more detail:

- Environmental and human security outcomes: Watershed restoration (bundled with savings groups and training) showed large improvements in environmental security ($g = 0.91$) and food security and nutrition ($g = 0.60$), and increased girls' secondary enrollment ($g = 0.38$). Economic security impacts

were on average large but more modest ($g = 0.21$), with mixed productivity results across tenure reforms and resettlement policies.

- **Social cohesion outcomes:** Property-rights formalization in Benin had a large effect on intermediate social cohesion ($g = 0.83$) by reducing appropriation and improving respect for ownership. Across settings, NRM interventions had large effects on willingness to participate or help ($g = 0.49$) and on trust and acceptance of diversity ($g = 0.42$), but these averages mask heterogeneity, including null effects for participatory mapping on trust and conflict measures.
- **Governance outcomes:** Information and deliberation campaigns in Mozambique increased civic participation ($g = 0.16$), but governance effects were mixed overall (government performance $g = -0.05$). A key nuance is that leader-only information increased elite capture and rent-seeking, while broad citizen information and deliberation improved accountability-related behaviors.
- **Conflict and diplomatic outcomes:** Across three studies, the estimated effect on the nature and scale of violence was essentially zero and slightly negative ($g = -0.00$), suggesting little or no average impact and possible adverse effects in some contexts when deeper structural drivers are not addressed. Interstate water cooperation had little or no measurable effect on diplomatic relations overall ($g = 0.00$), with qualitative and review evidence suggesting effects may be more likely in lower-conflict settings.

Confidence is mostly low to medium. Many outcomes rely on one study or a small number of studies, and several effect sizes come from a single setting or bundled package where the contribution of land reform or NRM cannot be separated from savings groups, training, or other components. Some estimates come from non-experimental designs or have reporting limitations such as incomplete attrition information. The strongest evidence in this set is from randomized evaluations of tenure-related reforms and large-scale information campaigns, but overall generalizability across contexts remains uncertain.

Reported effect sizes (Hedges g)

Outcome	g	Effect category	Studies	Effect sizes
Human security - Environmental security	0.91	Large effect (beneficial)	2	4
Intermediate social cohesion outcomes	0.83	Large effect (beneficial)	1	2
Human security - Food security and nutrition and health security	0.60	Large effect (beneficial)	1	4
Willingness to participate or help	0.49	Large effect (beneficial)	2	2

Feelings of trust and acceptance of diversity	0.42	Large effect (beneficial)	3	41
Human security - Educational security	0.38	Large effect (beneficial)	1	1
Human security - Economic security	0.21	Large effect (beneficial)	3	36
Community and state governance - Civic participation	0.16	Moderate effect (beneficial)	1	42
Diplomatic relations and peaceful dispute resolution	0.00	Little or no effect (beneficial)	1	1
Nature and scale of violence or atrocities	-0.00	Little or no effect (harmful)	3	8
Community and state governance - Government performance	-0.05	Small effect (harmful)	1	63
Community and state governance - Civic participation	n/a	Qualitative or review (no effect size)	1	0
Diplomatic relations and peaceful dispute resolution	n/a	Qualitative or review (no effect size)	4	0
Human security - Environmental security	n/a	Qualitative or review (no effect size)	4	0
Community and state governance - Government performance	n/a	Qualitative or review (no effect size)	3	0
Nature and scale of violence or atrocities	n/a	Qualitative or review (no effect size)	1	0

Willingness to participate or help	n/a	Qualitative or review (no effect size)	1	0
Feelings of trust and acceptance of diversity	n/a	Qualitative or review (no effect size)	1	0
Human security - Economic security	n/a	Qualitative or review (no effect size)	3	0