Land Management
Systematic Review
Policy Brief
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Department for Environment, Food & Rural Affairs

International Initiative for Impact Evaluation

Designing effective land management programmes for both people and the environment

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What the evidence tells us

The International Initiative for Impact Evaluation (3ie) conducted a systematic review of **three types** of land management programmes in low- and middle-income countries (L&MICs):

(a) decentralising land management and monitoring

(b) granting land rights

(c) establishing protected areas

The objective of the review was to critically appraise and synthesise the most up-to-date evidence in order to understand the effect of these programmes on environmental and human well-being outcomes; to examine the barriers, enablers, trade-offs and synergies that can impact the success of such programmes; and to identify the conditions under which they can provide value for money. **This Policy Brief presents key learnings from the review.**

Area of global land degraded

Land is at the heart of community livelihoods in L&MICs, especially among the poorest and most vulnerable groups.[1,2] However, **at least 20% of global land has been degraded**[3] and the number of species at risk of extinction has dramatically increased in recent decades.[4,5,6] These combined phenomena contribute to an accelerating rise in global temperature, as land loses its ability to sequester carbon while carbon stocks are reduced.[5]

Inclusive land management programmes are needed to mitigate climate impacts, to preserve biodiversity, and to support communities – particularly those at risk. Their design should consider potential trade-offs and synergies between the protection and restoration of natural systems and the provision of human well-being and livelihoods. A nuanced understanding of existing human and environmental vulnerabilities can provide crucial insight when designing programmes to positively affect the environment and its people.

Key findings

There is consistent evidence that the three types of **land management programmes reviewed** can result in the adoption of sustainable use of land resources (at least in the short term) and improve productivity and income levels. This evidence is particularly strong for decentralised land management programmes. However, we did not find statistically significant effects on other longer-term environmental or human well-being outcomes.

Key factors contributing to programme success include effective governance of land resources, sufficient funding, the involvement of women and the broader local community, and an alignment with local economic incentives.

Further evidence is needed to robustly assess the effects of these programmes on climate mitigation and biodiversity outcomes, longer-term human prosperity outcomes (such as food security, health and well-being, nutrition and clean air) and on different population groups and contexts. More evidence is also required to evaluate their financial costs and benefits.

Systematic review approach

The systematic review[7] was based on rigorous impact evaluations, published between 2000 and 2023, that used experimental or quasi-experimental study designs[8] to evaluate the effects of three types of land management programmes in L&MICs. These studies draw from the climate change and biodiversity evidence gap map (CCB EGM).[9]

We only included studies that reported effects on both environmental and human well-being outcomes, thereby enabling us to seek identification of possible trade-offs and synergies between them. **We included 60 programmes in the review.**[10]

Land management programmes included in the systematic review

Number:

32

a. **Community-based or decentralised land management and monitoring (DEC):** Programmes that foster community participation in decision-making processes. These typically involve transferring some degree of responsibility for land management from central governments to local actors (private sector, local communities or government).

14

b. **Land rights (LR):** Formal registration of land, through either the conversion of communal or non-demarcated rural land to freehold titles, or the legal recognition of customary or communal rural land rights.

10

c. **Protected areas (PA):** Regulatory frameworks, such as national parks or reserves, where access and use of resources are either fully restricted or regulated to achieve long-term conservation with associated ecosystem services and cultural values.

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Multiple land management programmes[11]

One limitation of the systematic review is the scope of studies reviewed. The CCB EGM includes another **378 studies that evaluated the effects of these three land management programmes** on either environmental or human well-being outcomes. As these studies were unlikely to report on trade-offs or synergic environmental and human well-being outcomes, we excluded them from the review.

When compared to the EGM, studies reporting effects on climate mitigation outcomes and studies of protected areas are underrepresented in the systematic review; this indicates that evaluations of protected areas were more likely to focus solely on environmental outcomes, particularly climate mitigation measures. As 18% of the world's terrestrial and inland water areas are under some type of protected area status,[12] it is surprising that we found only a few evaluations reporting environmental and human well-being effects of protected areas in L&MICs. This may reflect a disciplinary gap in which researchers act in silos rather than examining socio-ecological systems. Given the importance of addressing socio-environmental crises (i.e., poverty, climate change, biodiversity loss), it is crucial to bridge this gap.

Evidence by programme type

- Decentralised land management programmes **had the most available evidence**, while protected areas had the least.
- Most of the programmes reported short-term environmental outcomes – **primarily natural resource use** (e.g., investments in forests or soil and water conservation) and **land cover measures** (e.g., forests and vegetation areas). Most studies also reported short-term human well-being outcomes and measures related to productivity, income and employment.
- Biodiversity, climate mitigation and longer-term outcomes that can support adaptation, such as food security and health and well-being, **were less explored in the studies.** Likewise, we did not find sufficient evidence to study the effects on habitat structural complexity, greenhouse gas emissions, nutrition or clean air.

Extent of quantitative evidence

(cells with blue dots indicate areas in which we found sufficient evidence to conduct meta-analyses)

Outcome group	Outcome type	DEC	LR	PA
Short term environmental outcomes	Natural resource use and management	●	●	●
	Land and water cover	●	●	●
Biodiversity	Environment status and health	●	●	●
	Species complexity	●		
	Habitat structural complexity			
Climate mitigation	Greenhouse gas emissions			
	Carbon storage and sequestration	●		
Short-term human well-being outcomes	Knowledge acquisition	●		
	Practice and technology adoption	●	●	
	Land rights and tenure	●	●	
Longer-term outcomes to support adaptive capacities	Productivity	●	●	●
	Income, assets and basic materials	●	●	●
	Employment and livelihoods	●	●	●
	Food security	●	●	
	Nutrition			
	Health and well-being			●
	Social relations	●	●	
	Governance and empowerment	●	●	
	Water access	●		
	Clean air			
	Climate risk exposure and resilience	●		
	Multi-dimensional poverty	●		●

Quantitative findings

The following summary shows the statistically significant results of our meta-analyses, along with any substantial driving factors. The findings present an important caveat: for most analyses, we synthesised **fewer than 10 programmes**; therefore, in many cases we could not explore the ways in which the results varied by context, target populations and programme or study characteristics. However, even when based on a small number of programmes, meta-analyses are preferable to ad hoc summaries.[13,14] We found only positive effects, aside from one analysis (i.e., the effect of land rights on migration, which is specified in the summary).

We cannot conclude from the review that programmes focused solely on environmental outcomes, ignoring social outcomes, are less likely to be successful, as all studies reviewed investigated both types of outcomes. Nonetheless, where programmes evaluated both environmental and human well-being outcomes, there is some evidence of positive effects and very limited evidence of adverse effects.

Summary of statistically significant findings by programme type[15]

Effects of decentralised land management and monitoring

Short-term environmental outcomes:

- Increased investment in forests, tree planting and preservation, and natural resource monitoring
- Reduced area used for agricultural and forestry products

Short-term human well-being outcomes:

- Improved conservation attitudes and education attained
- Strengthened environmental practice and technology adoption
- Enhanced use of household technologies

Longer-term outcomes to support adaptive capacities:

- Increased income, where programmes in least developed countries showed smaller income gains than in other countries, while programmes in Sub-Saharan Africa reported a higher income increase compared to those in East Asia and the Pacific countries
- Improved access to services, including credit
- Diversified income sources
- Increased share of total income from forest products, agriculture or livestock
- Enhanced household involvement in environmental protection
- Strengthened governance of natural resources

Effects of land rights

Short-term environmental outcomes:

- Increased investment in natural resources or conservation

Longer-term outcomes to support adaptive capacities:

- Improved agricultural or livestock productivity
- Increased value of production outputs per area
- Diversified income sources
- More out-migration for work (adverse effect)

Effects of protected areas

Short-term environmental outcomes:

- Decreased deforestation

Longer-term outcomes to support adaptive capacities:

- Improved agricultural or livestock productivity
- Increased income and assets

Qualitative findings

Summary factors that can affect programme success, with case studies

Programme-related factors

Aligning programme activities with existing community livelihoods, or embedding alternative income-generating opportunities to support livelihoods, can be not only an important enabler, but can also create virtuous circles for the sustainability of land and livelihoods.

Case study:

A community-based ecotourism programme in China helped participants to maintain their traditional livelihoods rather than replacing livestock-based income with full reliance on tourism. When complemented with seasonal ecotourism, this provided locals with higher profits. There were also trade-offs identified, such as ecotourism negatively impacting plant diversity and soil stability.[16] In addition, more connected and educated populations benefited most from ecotourism, as they had access to ICT infrastructure and used their language skills to attract tourists.[16,17]

Aligning with communities' traditional values and integrating all groups within the community can strengthen local involvement and act as both an enabler and a barrier to programme success, depending on whether local values are in line with the programme. This should be approached constructively, recognising that values can evolve. Gender equality and inclusion can coexist with traditional values by collaborating with communities, promoting participation and reducing marginalisation while encouraging positive social change.

Case study [enabler]:

In a forest co-management programme in Malawi, participants were more invested in achieving programme goals in communities that relied on the advice of their local leaders.[18]

Case study [barrier]:

In Namibia's Kwandu Conservancy, women were hesitant to take on roles seen as physically demanding or traditionally masculine, and were often not elected for positions offering stipends.[19]

Knowledge-sharing opportunities – including tailored training when required and community-level involvement in programmes activities – can act as an enabler, whereas their absence can be a barrier. These activities can help implementers and participants to be continuously involved in programme implementation, and can support increased ownership of decision-making among rural participants.

Case study:

In the Amani Butterfly Project in Tanzania, farmers were accustomed to a culture of sharing knowledge with one another and with project staff, contributing to the successful implementation of butterfly farming.[20]

Lack of clarity on programme documentation, processes, roles, and responsibilities, or inadequate governance and funding structures can be barriers to programme success. This can lead to corruption or generate social conflicts due to perceived or real unfair distribution of costs and benefits, thereby creating risks for long-term sustainability.

Case study:

An evaluation of Tanzania's Joint Forest Management programme reported that the absence of by-laws hindered programme implementation at the village-government level. Other local stakeholders pointed to a lack of clearly defined responsibilities, which led to an absence of accountability and frustration among community members.[21]

Conservation efforts can potentially and unintentionally lead to deforestation, land degradation and biodiversity loss if they do not provide the right incentives for programme adoption or anticipate behavioural changes. Increases in wildlife populations due to conservation efforts can also result in decreased food security and damaged properties, potentially affecting people's livelihoods.

Case study:

In a collaborative management agreement programme in Uganda, participants reported insufficient food access, as the programme prevented hunting and fruit collection, and led to wild animals destroying food crops.[22]

Higher-level contextual factors

Climatic shocks, population growth, and migration (e.g. unplanned settlements due to climate, conflict or food insecurity) are increasingly unpredictable, and can have devastating effects on land use and people's capacity to adapt. These factors can cause significant disruption to programmes; for example, drought-related water shortages may impact conservation efforts, and increased population pressures can affect forest degradation and resource depletion. While these factors can be difficult to anticipate, programme designs can consider the likelihood of them occurring and assess their potential impact on programme effectiveness.

Case study:

In the Northern Rangeland Trust programme in Kenya, unplanned settlements and growing human populations resulted in fragmented rangelands, negatively impacting livestock and wildlife, and reducing the reliability of access to water sources.[23]

Cost evidence of included studies

The programmes did not follow a consistent methodology when presenting evidence of their financial cost. We found four programmes with sufficiently reliable economic data, which is consistent with the broader development field, as fewer than one in five impact evaluations integrated a cost assessment.[24]

These four programmes employed distinct analytical frameworks, from comprehensive cost-benefit analyses with and without comparisons to partial economic evaluations that emphasised cost minimisation. In addition, these four cost analyses focused solely on human well-being outcomes.

These methodological differences reflect the complexity in valuing diverse outcomes across different contexts. While benefit-cost ratios and the economic internal rate of return provide useful metrics for comparing financial returns, they often fail to capture the full spectrum of programme benefits, particularly non-monetary outcomes (e.g., improved governance structures and institutional capacity building).

There are different patterns in the relationship between programme scale, scope and cost-effectiveness. The Ethiopian Land Certification Programme, with its narrow focus and streamlined implementation approach (leveraging locally elected land administration committees and field-based adjudication with neighbours present), achieved remarkable cost-efficiency and scale (US$1 per parcel compared to US$7–40 in other regions). This exemplifies how locally driven and participatory processes can reduce costs while maintaining quality outcomes.

In contrast, more comprehensive programmes, such as the Pasture Development Project in Tajikistan and the Community-based Integrated Natural Resources Management Project in Ethiopia, which have multiple components and broader objectives, showed more variable cost-effectiveness across different programme elements.

The Mexican Community Forestry Programme is an intermediate case, wherein a sectoral focus (forestry) combined with multiple strategies (e.g., technical assistance, institutional strengthening, product diversification) achieved substantial economic returns while maintaining community control over resources and benefits (communities captured over 85% of value-added locally and achieved economic internal rates of return of 16-50%). Hence, the cost-effectiveness of these programmes may depend less on technical sophistication than on appropriate institutional design and community engagement.

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Alignment with existing evidence

The systematic review builds on previous high-quality reviews[25,26,27,28,29] and offers the most up-to-date synthesis of land management programmes in L&MICs. Unlike earlier reviews, this is the first to systematically examine studies reporting effects on both environmental and human well-being outcomes, and has a distinct focus on identifying the programmes' trade-offs and synergies between environmental and human well-being.

The findings of the systematic review broadly align with earlier evidence, supporting that:

- Community-based or decentralised land management and monitoring, as well as land rights programmes, can improve human well-being, including income and diversified income sources;[25,29]
- Ensuring governance quality, securing community rights, and incorporating inclusive designs are important elements for programme success;[25,27,28,29]
- Substantial gaps remain in the evidence base on environmental outcomes (e.g., the effect of protected areas on species complexity)[26,29] and longer-term human well-being outcomes (e.g., the effect of decentralised and community-based management programmes on nutrition and health).[25,27,28,29]

While recognising the need for more robust evidence in the field, this review contributes valuable new findings:

- Community-based or decentralised land management and monitoring programmes improved investment in natural resource conservation; natural resource governance; conservation attitudes and education attained; environmental practices and technology adoption; and access to credit and other services;
- Land rights programmes enhanced investment in natural resources, and productivity;
- Protected areas programmes slightly reduced deforestation and had small but meaningful benefits in income, assets and productivity.

Implications for policy and programming

Land management programmes should be considered as one possible strategy to promote the sustainable use of land resources and to improve human well-being. This combined approach was reported to be successful in several cases, including the Plantation Establishment and Livelihood Improvement Scheme in Kenya. This programme enhanced household participation and well-being by offering benefits that promoted the sustainable use of land resources (such as creating opportunities to extract forest products and providing plots for growing crops) which, in turn, increased participants' income.[30]

New programmes should aim to work effectively with local targeted groups by integrating:

- The groups' traditional values;
- All participants within the community (including, for example, Indigenous peoples, women, and those living in poverty) with attention to how programmes may affect them differently;
- Knowledge-sharing and tailored training;
- An adequately funded, trained and transparent governance body capable of effectively managing land resources;
- Frequent and clear communication of the programme's objectives.

Land management policies should reflect the interconnected nature of environmental health and human well-being, as well as the potential for mutually reinforcing outcomes (synergies). Programmes that overlook threats to local livelihoods – which are often closely tied to land use – risk leading to unintended environmental damage or worsening human well-being outcomes. For example, the Joint Forest Management programme in Tanzania imposed conservation restrictions that reduced access to key livelihood resources, thereby making it difficult for villagers to maintain their incomes. This situation was exacerbated by a lack of support for alternative livelihoods, lack of compensation for crop losses due to wildlife, and limited community awareness of the benefits of conservation.[31]

In contrast, the Northern Rangeland Trust programme in Kenya showed a virtuous cycle of improved conservation and livelihoods by establishing grazing zones and schedules that aligned with traditional livestock-raising practices. These efforts reduced degraded bare ground and improved forage availability, which strengthened livestock health and increased livestock product yields.[32]

Programmes should be informed by a comprehensive understanding of past research in the specific context, as well as its local socio-environmental dynamics. Programmes should conceptualise and anticipate expected effects, in addition to possible unintended consequences, and examine assumptions at each stage of the theorised causal chain (outputs, outcomes, impacts). For example, the Community-based Conservation Associations programme in Kenya aimed to improve both livelihoods and sustainable forest management, but land degradation persisted and worsened in some areas after the programme ended.[33]

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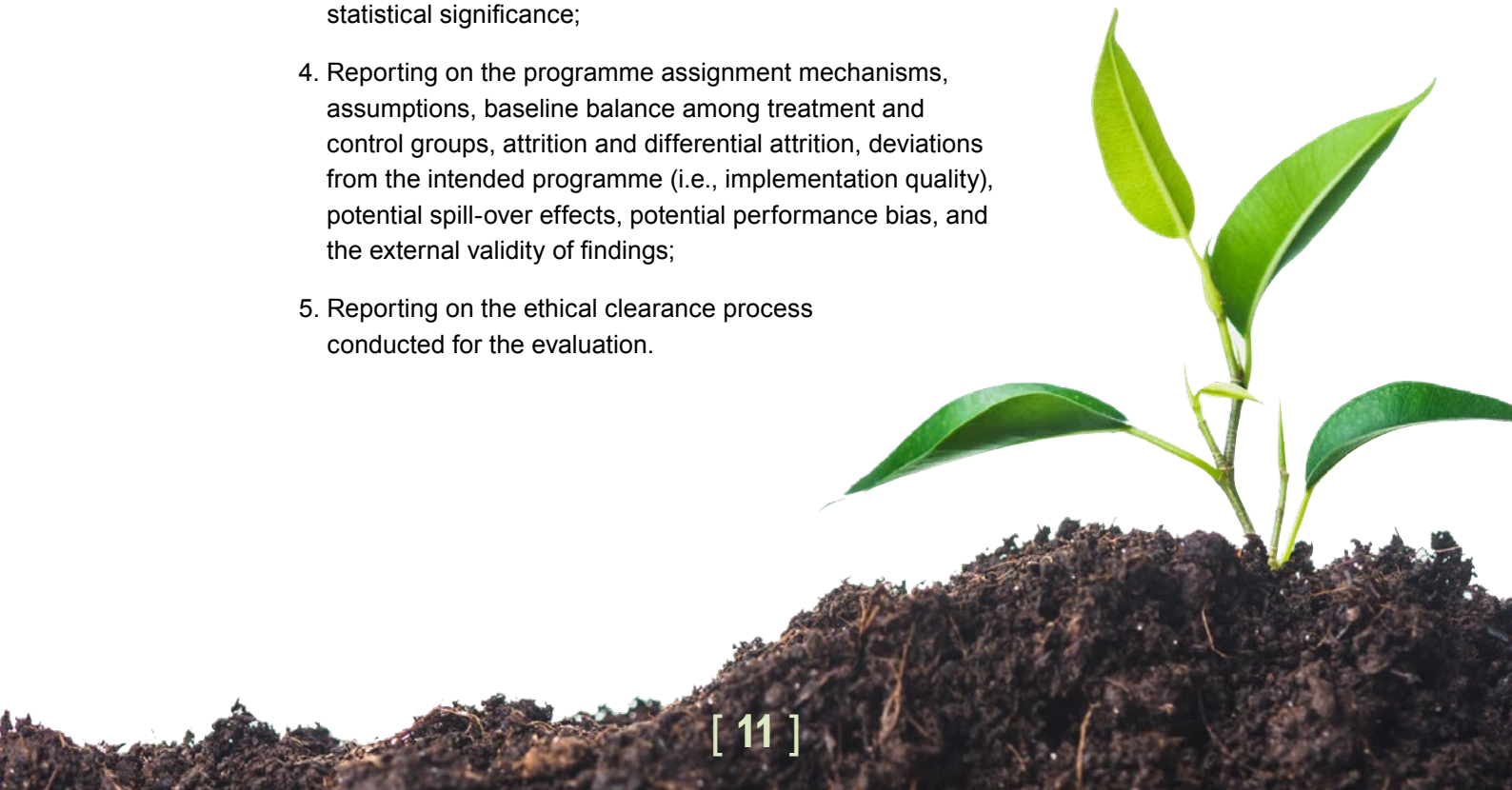
Effects of programmes on disadvantaged and vulnerable groups should be studied more. Incorporating evaluative thinking into programme design from the inception phase often allows to account for specificities of local communities; therefore it can lead to more rigorous and detailed analyses of the programme's effects. This practice can also adaptively magnify effects, as learning gained from evaluations can be applied during programme implementation.

For example, the Northern Rangeland Trust programme in Kenya was enhanced by promoting leadership roles for women in trainings, community meetings and programme activities (e.g., improving grasslands by clearing invasive species and helping to control erosion). The programme's assessment found that consistent efforts to engage diverse groups of people were successful, and recommended the continuation of this engagement, as well as the inclusion of women as landscape decision-makers.[23]

Programmes should promote rigorous and transparent evaluation research. Policies and programmes should be implemented, monitored and evaluated to facilitate learning and adaptation, as well as to create the conditions for sustainable transformation. To produce relevant and credible evidence, high-quality evaluations must not only report unbiased programme effects (i.e., capable of attributing observed changes in population outcomes to programme activities) and their detailed costs, but also be aligned with transparency, replicability and ethical principles.[34] These elements are essential for building trust in evaluation findings and maximising learning from programmes.

Research funders and commissioners can contribute to promoting these principles by requiring research standards for high-quality impact evaluations, including:

1. Registering a pre-analysis plan, establishing an appropriate counterfactual (through robust quasi-experimental[35] or experimental[36] designs) and collecting baseline data from all programme participants (which could leverage programme monitoring processes and data);
2. Collecting outcome data from programme participants at similar periods for treatment and control conditions;
3. Accounting for multiple-hypotheses testing in the analyses and reporting findings on all outcomes, clearly indicating their statistical significance;
4. Reporting on the programme assignment mechanisms, assumptions, baseline balance among treatment and control groups, attrition and differential attrition, deviations from the intended programme (i.e., implementation quality), potential spill-over effects, potential performance bias, and the external validity of findings;
5. Reporting on the ethical clearance process conducted for the evaluation.



About this brief

The systematic review and related briefs were commissioned by Defra through its service agreement with Itad to provide Monitoring, Evaluation and Learning (MEL) services for its international programming (Project name: Understanding What Works in Conservation, Climate and Development Interventions – Systematic Review. Project number: 2024-041).

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Department for Environment, Food & Rural Affairs

3ie International Initiative for Impact Evaluation

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[8] Impact evaluations using experimental or quasi-experimental designs estimate the effects of a programme by comparing outcomes to a counterfactual—what would have occurred in the absence of the programme. This approach follows best practice as it allows for causal attribution of observed changes (Marion et al., forthcoming - submitted for publication, Appendix 1).

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[10] The number of programmes analysed was higher than that of unique studies, as three studies reported on multiple programmes. Also, six programmes were evaluated by more than one study.

[11] Four programmes combined activities from more than one type, so were included in each analysis as relevant.

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