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DESIGNING COST-EFFECTIVE INCENTIVES FOR TANZANIA'S ECOLOGICAL CORRIDORS

QAMBEMEDA. M. NYANGHURA, JAN BÖRNER & LISA BIBER-FREUDENBERGER

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INTRODUCTION

Multiple international initiatives aim to halt or at least reduce the ongoing and alarming global loss biodiversity. This includes area-based measures such as the conservation of species and their habitats in protected areas. Nevertheless, most of these protected areas are not well connected and therefore do not allow species to move from one protected area to another. Such ecological corridors would however be important, in particular for species that travel long distances such as elephants, as well as other species that need to shift their habitats due to climate change. Moreover, especially in sub-Sahara Africa existing ecological corridors are often threatened by agricultural expansion for subsistence farming by small scale farmers, affecting not only biodiversity but also human-wildlife-conflicts. Designing effective conservation policies that halt habitat fragmentation and incentivize farmers to conserve areas in ecological corridors is thus crucial for long-term sustainability of protected areas. One policy instrument, that is frequently applied is compensating the farmers for their foregone agricultural income if they decide to conserve. This falls under the term Payments for Ecosystem Services (PES). Whether a farmer decides to participate or not is however driven by different aspects including the design of the payment scheme, local contextual factors (e.g., the distribution of land) and the mindsets of the farmers. For incentive schemes to be effective, they must engage farmers with varying land sizes and mindsets. Ideally, these farmers, with unequal land and mindsets, even coordinate their conservation decisions to create contiguous areas large enough to sustain biodiversity movement and ecological connectivity. But when land sizes differ, small farmers may feel disadvantaged and less willing to cooperate. Farmers' values also shape behavior—some care more about nature, others about personal gain.

In behavioral experiments[1] with farmers, we tested two PES designs, a Fixed Payment (FP) and an Agglomeration Bonus (AB), to compensate farmers deciding to conserve parts of their land. While the FP design would compensate farmers independently if they coordinate, the AB design would reward them for coordinated conservation effort. We conducted these experiments in two ecological corridors in Tanzania (Figure 1) to find out how effective they are in terms of establishing connectivity and how differences in land ownership as well as personal values of farmers affect the decision of farmers to conserve.

Key findings and policy implications

Both payment schemes enhance conservation behavior: Under both incentive designs (FP and AB) farmers were more likely to conserve than without any financial compensation. This indicates that there is generally the potential for PES to support conservation of ecological corridors in Tanzania.

Differences in land size had no tangible effect on conservation behavior: The conservation contributions of small and large landholders were comparable, irrespective of the payment design. This may be linked to a strong sense of community in Tanzanian societies and indicates that unequal land size distribution among farmers is not an important challenge for the design of effective conservation incentives in ecological corridors in Tanzania**.**

Personal values significantly affect conservation behavior: The experiments with farmers showed that the mindsets of farmers and their values were very important for their decision to conserve. Famers with high so-called biospheric values were much more likely to conserve than farmers with high egoistic values. This suggests that for a stronger focus on conservation strategies supporting a positive human-nature relationship and biospheric values might be a crucial leverage point to improve conservation and cost effectiveness of PES schemes. Prioritizing investments in conservation education of future generations for example through

[1] See the detailed experimental design and procedure here https://doi.org/10.1016/j.ecolecon.2024.108152

specific programs in schools or for farmers may provide a leverage point with a potential that is often underestimated.

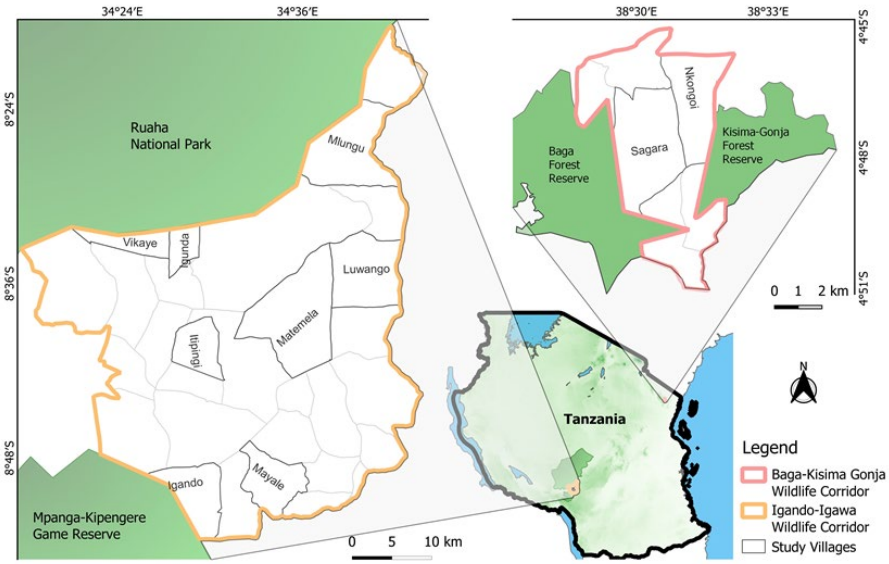

Figure 1: Map of the study area showing the two ecological corridors (Igando Igawa Wildlife Corridorand Baga Kisima Gonja) and the 10 villages within those corridors, where farmers participated in the experiment

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CONTACT

Qambemeda. M. Nyanghura[1], Jan Börner[1,2] and Lisa Biber-Freudenberger[1]

[1] Center for Development Research (ZEF), University of Bonn, Genscherallee 3, 53113 Bonn, Germany
[2] Institute for Food and Resource Economics (ILR), University of Bonn, Nussallee 19, 53115 Bonn, Germany.

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Center for Development Research (ZEF) University of Bonn
Genscherallee 3
53113 Bonn I Germany
Presse.zef@uni-bonn.de
+49 (0) 228 / 73 6124

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