

Reducing people's vulnerability to climate change in the rural Global South using Nature-based Solutions



Challenge

To reduce the vulnerability of communities to the impacts of climate change such as drought and floods, especially in the Global South where climate impacts are most severe and where people are particularly dependent on nature for their livelihoods.

Solution

To implement nature-based solutions such as ecosystem restoration. Our research¹ shows that such actions can help reduce people's vulnerability to climate change impacts across a diversity of social and environmental contexts.

Recommendations for policymakers

- 1** Make explicit, in policy, that NbS can be implemented across a wide range of ecosystems and socioeconomic contexts.
- 2** Recognize that the effectiveness of NbS and enabling factors are context-dependent.
- 3** Engage the full range of affected stakeholders and rights holders to understand what makes NbS effective, address people's adaptation priorities and needs, and how they link to wider development processes.
- 4** Adapt policy response so that they take into account the political, technical, social, and/or economic factors that impact NbS effectiveness.



**1.2
billion**



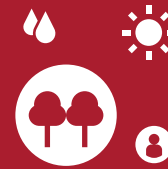
Number of people in tropical countries that are highly dependent on nature for basic needs².

95%



Proportion of NbS cases for which positive climate change adaptation outcomes were reported¹.

88%



Proportion of NbS cases reported to reduce vulnerability to climate change by reducing the vulnerability of the ecosystems on which people depend¹.

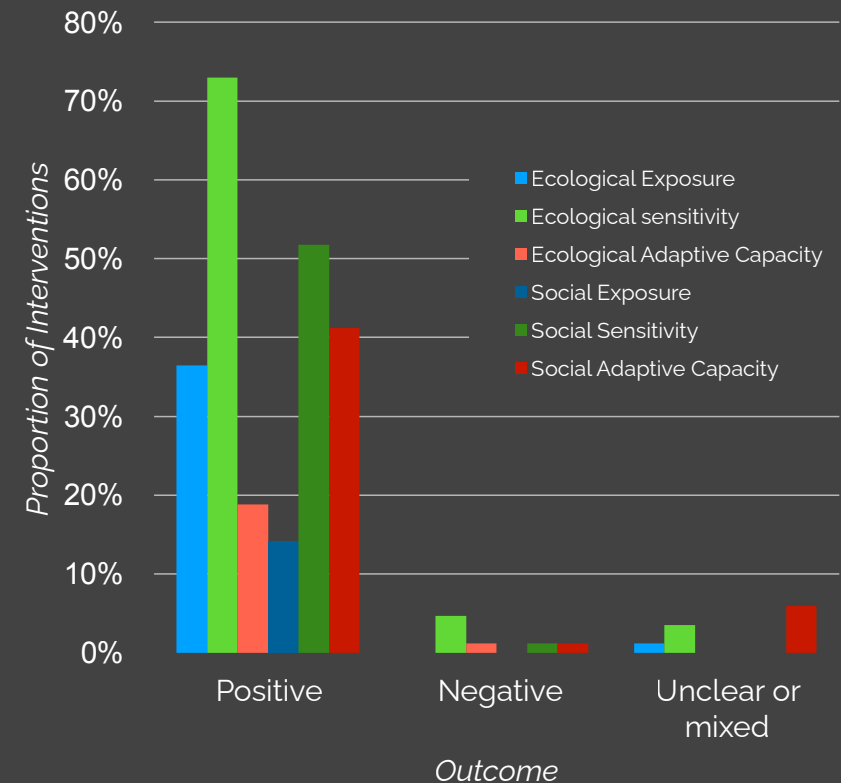
65%



Proportion of NbS cases that influenced people's vulnerability in additional ways, such as reducing exposure of community assets, strengthening resource management institutions or building social capacities¹.

Summary

Although evidence for the effectiveness of NbS for adaptation is growing, there is scant information on whether and how NbS reduce vulnerability to climate change in the Global South, despite this region being home to the majority of the world's most climate-vulnerable people. To address this, we - an interdisciplinary team at the Nature-based Solutions Initiative, UK, Linköping University, Sweden, and the University of Liberal Arts, Bangladesh - systematically collated 85 case studies of nature-based interventions in rural areas of low and lower-middle income nations across a range of ecosystems and addressing a diversity of impacts of climate change. We assessed the effectiveness of these interventions at reducing social and ecological vulnerability, through three different pathways: reducing exposure and sensitivity, and building adaptive capacity. We then conducted an analysis on the mediating factors of effectiveness of these interventions.



Proportion of NbS cases displaying outcomes across the 6 vulnerability-reduction pathways.

Key findings

- 1** Most people whose vulnerability was influenced by the NbS have nature-dependent livelihoods, making them especially vulnerable to the climate crisis.
- 2** An analytical framework based on knowledge of social and ecological contexts and vulnerability was applied to explore the pathways through which NbS reduce people's vulnerability to climate change.
- 3** Pathways included social and ecological exposure, sensitivity, and capacity to adapt, with most NbS leading to positive outcomes from each pathway.
- 4** Overall, NbS were reported to reduce vulnerability by lowering ecosystem sensitivity to climate impacts (reported for 73% of interventions), reducing social sensitivity (43%), reducing ecological exposure (37%), increasing social adaptive capacity (34%), ecological adaptive capacity (18%) and/or reducing social exposure (12%).
- 5** The effectiveness of NbS in reducing vulnerability was influenced as much by the social and political context (e.g. institutions regulating access rights), as by technical elements of interventions (e.g. length of treatment time).
- 6** Effectiveness, including how NbS benefits were distributed between different groups, was also strongly influenced by formal and informal institutions governing or shaping the interventions.

Enabling factors

- **Political** - Historical, contextual, and intrinsic institutions and issues of empowerment, ownership and access, conflict management (e.g. how issues of land tenure and clashing systems of ownership constrain benefit delivery).
- **Social** - Education and inclusion of knowledge, values, and community members (e.g. how education influences NbS uptake, or its operation).
- **Technical** - Aspects of NbS design (e.g. species chosen for restoration).
- **Economic** - Income, inequality, and poverty levels (including how the generation of income by the NbS generates support).



Illustrative example: Reducing ecosystem sensitivity through land restoration

Mekuria et al., (2015) studied an NbS³ that used exclosures to restore degraded land in a montane ecosystem in Northwestern Ethiopia, where local livelihoods mostly depended on agriculture and livestock farming. The intervention involved seasonal protection of the lands from livestock grazing and harvesting (apart from grasses and roots), and spatial zoning of communal grazing lands. First, the intervention reduced ecological sensitivity through land use and access restrictions, thereby reducing soil degradation and improving vegetation cover. This meant that the soil became less sensitive to climate- related erosion processes as the vegetation cover reduced the impact of stressors like wind or water run-off. Secondly, the intervention rehabilitated water gullies, reducing the soil erosion due to environmental shocks and stresses. As the soil improved, indigenous trees regenerated, vegetation cover improved, and fodder supply increased, benefiting livestock farmers dependent on soils for fodder and water.

Recommendations for policymakers

Make explicit, in policy, that NbS can be implemented across a wide range of ecosystems and socioeconomic contexts; this is key to reduce people's vulnerability to climate impacts across landscapes and seascapes.

Recognize that the effectiveness of NbS and enabling factors are context-dependent; this is key to ensure policies are fit for purpose and practice is designed to suit the context in which NbS are implemented, including minimizing trade-offs.

Support transdisciplinary approaches engaging the range of stakeholders and rights holders to understanding NbS effectiveness and how this links to development processes.

Adapt policy response considering enabling factors and barriers that impact NbS effectiveness: political, technical, social, or economic.

Recommendations for practitioners

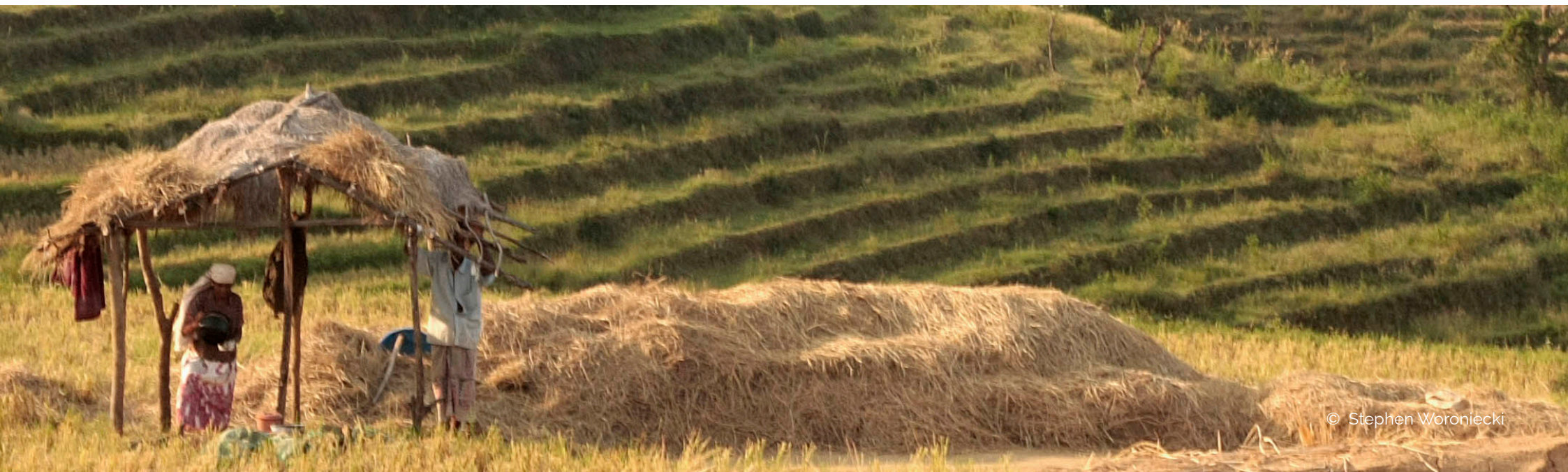
Pay close attention to intervention and vulnerability contexts, and shape NbS around local needs and adaptation priorities.

Pay close attention to how NbS may differentially affect various groups, beyond targeted beneficiaries; this is key to effectively manage trade-offs.

Monitor the climate risks to ecosystems themselves.

Capture, and hold crucial contextual elements together in study designs, so that NbS can be effective, equitable and sustainable.

Map and engage the range of stakeholders and rights holders to design, implement, and evaluate the effectiveness of NbS in reducing vulnerability.



References

This briefing is based on the findings of:

¹Woroniecki, S.; Spiegelenberg, F.A.; Chausson, A.; Turner, B.; Key, I.; Irfanullah, H.; Seddon, N. Contributions of Nature-Based Solutions to Reduce Peoples' Vulnerabilities to Climate Change across the Rural Global South. Preprints 2021, 2021100403 (doi: 10.20944/preprints202110.0403.v1).

Other cited literature:

²Fedele, G., Donatti, C. I., Bornacelly, I., & Hole, D. G. (2021). *Nature-dependent people: Mapping human direct use of nature for basic needs across the tropics*. Global Environmental Change, 102368.

³Mekuria, W., Langan, S., Johnston, R., Belay, B., Amare, D., Gashaw, T., Desta, G., Noble, A., & Wale, A. (2015). *Restoring aboveground carbon and biodiversity: a case study from the Nile basin, Ethiopia*. Forest Science and Technology, 11(2): 86–96

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