Effectiveness of Nature-based Solutions for Climate Change Adaptation: Lessons from thirteen projects in Asia, Africa and Latin America

The UN Secretary General’s Climate Action Summit, through its thematic track on Nature-based Solutions “provides an opportunity for redefining people’s relationship with nature” through the implementation of nature-based solutions. Nature-based Solutions (NbS) are actions that protect, sustainably manage and restore natural or modified ecosystems while simultaneously providing human well-being and biodiversity benefits. The UN recognises NbS as crucial to responding to climate change and sustainable development challenges at the scale and pace that are needed. Ecosystem-based adaptation (EbA), the use of ecosystem services to help people adapt to climate change, is championed as an effective strategy to address the linked challenges of poverty and climate change because of its comparative affordability and multiple co-benefits that contribute to sustainable development. EbA may also be referred to as NbS for adaptation. The effective implementation of NbS contributes to the overall summit objectives to “raise national ambition… promote transformative changes… [and] generate political momentum through enhanced social and political drivers.”

IIED, IUCN and UNEP-WCMC have carried out a study of thirteen on-the-ground NbS for adaptation projects to empirically evaluate their effectiveness. The results of this study both demonstrate the cross-cutting nature of NbS in addressing climate change and illustrate the societal challenges preventing broader uptake. The results furthermore inform efforts to achieve the objectives of the UNSG Climate Action Summit.

Table 1. IIED, IUCN and UNEP-WCMC evaluated the effectiveness of NbS for adaptation initiatives based on four aspects.

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<thead>
<tr>
<th>Aspect</th>
<th>Description</th>
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<tr>
<td>Effectiveness for societies</td>
<td>Has the initiative allowed people and communities to maintain or improve their adaptive capacity or resilience and reduce their vulnerability in the face of climate change, while enhancing co-benefits that promote long-term wellbeing?</td>
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<td>Effectiveness for ecosystems</td>
<td>Has the initiative restored, maintained or enhanced the capacity of ecosystems to withstand climate change impacts and other pressures, and to produce adaptation services for local communities?</td>
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<td>Financial and economic effectiveness</td>
<td>Are NbS cost effective and economically viable over the long term?</td>
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<td>Political and institutional issues</td>
<td>What social, institutional and political issues influence the implementation of effective NbS initiatives and how might challenges best be overcome?</td>
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What factors make NbS for adaptation effective?

A number of factors create the enabling environment and contribute to the effective implementation of NbS for adaptation.

**Government prioritisation of NbS for adaptation.** Dedicated national, government-level climate change bodies and budgets enable more effective implementation for NbS for adaptation than when responsibility for climate change or NbS lies only with a single ministry (e.g. a ministry of environment). For example, the Government of Nepal has increased targeted resources for climate change adaptation, earmarking 80% for the local level.

**Integrating NbS into climate change, disaster risk reduction** and natural resource-related policies (e.g. on fisheries, watersheds, etc) resulted in a strong supportive environment. Further, decentralised governance policies that support local organisation, and planning processes and policies that recognise indigenous land rights and protect traditional knowledge, lead to success. This was the case in South
Afric where environmental policies explicitly support NbS for adaptation. Kenya’s devolution of power to counties also provides structural support for adaptation funding and implementation at the local level.

**Strengthened capacity for implementation.** Even where NbS for adaptation is supported by various policies and plans, as was the case in South Africa and Peru, low capacity of implementing agencies and high government staff turnover led to ineffectiveness. Thus, strengthening capacity for implementation is crucial.

**Capable and committed NbS champions** drive and support implementation. These leaders can be government officials or members of civil society and can mobilise key stakeholders to implement and scale-up NbS. Members of the Asociación para la Naturaleza y el Desarrollo Sostenible (ANDES) and ‘Potato Guardians’ were instrumental in promoting the Potato Park and pushing for legislative change in Peru.

NbS are **multi-sectoral and collaborative** across a range of government levels and sectors, and sometimes across national boundaries. This requires cooperation across often-siloed government structures. Policies and initiatives in different sectors can be crafted to work together to contribute to NbS for adaptation, such as community forestry policies that support communities to protect and manage forests and watersheds. Further, multi-sectoral and collaborative NbS support capacity building and NbS integration into other sectors.

Working with or strengthening **local organisations and planning processes** can make NbS more just. Participatory processes and local and indigenous peoples’ knowledge are important elements for supporting effective NbS. When projects worked closely with local organisations, such as Istatén in El Salvador, and collective institutions and customary laws (in China and the Potato Park, Peru), benefits were shared more equally.

Strong **knowledge generation and sharing** among diverse stakeholders increased the effectiveness of NbS for adaptation. Farmer-to-farmer meetings and exchange visits were important in Uganda, Senegal, Burkina Faso and China, as was participatory plant breeding in Peru and China. Combining local and scientific knowledge facilitated implementation. For example, in China, local research was often conducted in collaboration with scientific institutes.

**What does this mean for policy?**

This study provides evidence of the critical role that NbS can play in helping people to adapt to climate change, and the enabling factors that make NbS successful in this role. Effectively applying NbS for climate change adaptation and mitigation sets governments on the path to achieving the targets of SDG 13 on climate action and the UNFCCC’s Paris Agreement, and can push progress towards other sustainable development goals.

SDG Target 13.1 calls for strengthened resilience and adaptive capacity in all countries. The study found that NbS strengthen the resilience and adaptive capacity of vulnerable ecosystems and communities. NbS for adaptation addressed vulnerability for humans in all the study sites, and the benefits of increased resilience accrued to diverse groups of people, including vulnerable groups who rely on ecosystems and ecosystem services for their livelihoods and wellbeing. Upstream forest

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**Box 1. NbS case studies assessed**

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Location</th>
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<tbody>
<tr>
<td>Incentive-based Hilsa Conservation Programme</td>
<td>Bangladesh</td>
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<tr>
<td>Ecosystems Protecting Infrastructure and Communities</td>
<td>Burkina Faso</td>
</tr>
<tr>
<td>Ecosystems Protecting Infrastructure and Communities</td>
<td>Chile</td>
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<tr>
<td>Participatory plant Breeding</td>
<td>China</td>
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<tr>
<td>Adaptation, Vulnerability and Ecosystems project in the Sixaola River</td>
<td>Costa Rica</td>
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<tr>
<td>Governance for Ecosystem-based Adaptation</td>
<td>El Salvador</td>
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<tr>
<td>Supporting Counties to Mainstream Climate Change in Development</td>
<td>Kenya</td>
</tr>
<tr>
<td>Ecosystem-based Adaptation in Mountain Ecosystems</td>
<td>Nepal</td>
</tr>
<tr>
<td>The Potato Park: Ecosystem-based Adaptation in Mountain Ecosystems</td>
<td>Peru</td>
</tr>
<tr>
<td>Ecosystems Protecting Infrastructure and Communities</td>
<td>Senegal</td>
</tr>
<tr>
<td>Climate Resilient Livestock Production on Communal Lands</td>
<td>South Africa</td>
</tr>
<tr>
<td>Ecosystem-based Adaptation in Mountain Ecosystems</td>
<td>Uganda</td>
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</table>
management in Nepal led to agricultural and water provisioning benefits downstream, while communities around the Potato Park in Peru shared in the adaptation benefits of more resilient seeds. In addition, through cost-effectiveness and relative affordability, NbS contribute to achieving this goal in LDCs.

In line with Target 13.2, integrating NbS for adaptation into national policies and frameworks can help countries to integrate climate change considerations into these policies. For example, Nepal’s 2011 National Framework for Local Adaptation Plans for Action provides for delivering adaptation services to the most climate vulnerable areas and people.

Target 13.3 seeks to improve education, awareness-raising, and human and institutional capacity on climate change adaptation and disaster risk reduction. The study found that strong knowledge generation and sharing among local communities and government led to successful implementation of NbS for adaptation. Knowledge sharing included peer-to-peer learning, meetings and workshops, trainings and discussion fora.

Finally, effective NbS, including implementing pro-poor NbS, requires the active participation and engagement of local communities and vulnerable groups. This contributes to SDG Target 13.B on promoting mechanisms for raising capacity for effective climate change-related planning and management including focusing on women, youth and local and marginalised communities. The Potato Park in Peru, for example, is run by communities on the basis of customary laws. In Bangladesh, greater fisher involvement could have improved fish production and the effectiveness of the fish sanctuary zones established in contributing to sustainable fisheries management. Although the government perceived the project as cost-effective due to the added tax revenue, fishers reported lost income due to prohibition on fishing.

By deploying NbS, countries and their partners can make progress towards the targets of SDG 13, and also uphold Article 7 of the Paris Agreement. Specifically, instituting the enabling factors of NbS responds to Article 7 Clause 7, which calls for sharing knowledge and lessons (7a), strengthening institutions arrangements (7b), assisting developing country Parties in identifying effective adaptation practices, needs and priorities (7d), and improving the effectiveness and durability of adaptation actions.

Conclusion

The effective implementation of NbS for climate change adaptation has the potential to increase the resilience of ecosystems and human societies, while addressing societal, structural and institutional challenges. Through developing an enabling environment for NbS, governments can address issues of local engagement and participation, strengthen institutional and stakeholder capacity, and establish better linkages among diverse actors. Effective NbS implementation responds to the Thematic Track 8 of the Secretary General’s Climate Action Summit. NbS for adaptation are concrete and realistic, promote transformative changes and address societal challenges in line with the UN Secretary General’s call to climate action.

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