NATURE-BASED SOLUTIONS FOR ADAPTATION

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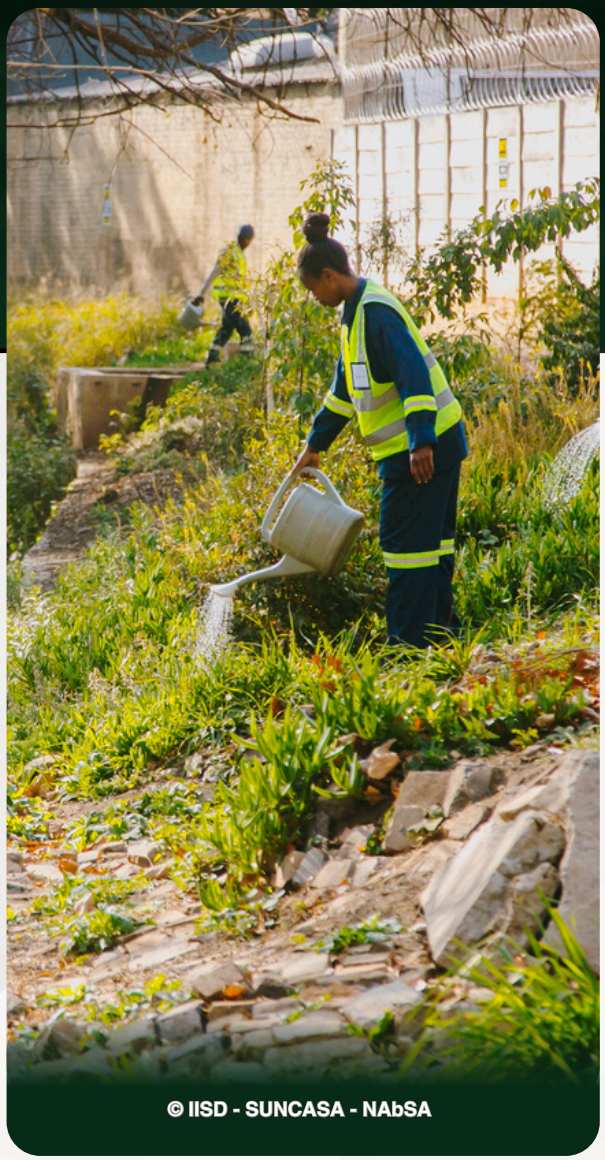
RESILIENT WATERS: Nature-based Pathways for Climate Adaptation

This thematic brief explores how Nature-based Solutions (NbS) for climate adaptation can strengthen water resilience while advancing gender equality and social inclusion. Drawing on global case studies and practitioners' experience, it highlights integrated watershed approaches, participatory governance models and community-led innovation that align ecological restoration and conservation with equitable outcomes. The brief offers practical insights for designing, implementing and scaling gender-responsive NbS across the water continuum.



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WHY NBS MATTER FOR WATER BANKRUPTCY

Around the world, water systems are becoming increasingly strained by climate change – from more frequent floods and droughts to declining water quality and degraded ecosystems. These pressures are no longer temporary disruptions but part of a deeper, long-term transformation of hydrological systems. As highlighted in Global Water Bankruptcy: Living Beyond Our Hydrological Means in the Post-Crisis Era (Madani 2026), the notion of a "global water crisis" can be misleading: while it suggests a short-term shock, many regions are instead experiencing sustained and in some cases irreversible degradation.

In this context, **water bankruptcy** describes a post-crisis condition in which droughts, water shortages and pollution episodes – once considered temporary – become chronic and persistent across regions. Recognising this shift is critical. It signals that water management can no longer aim to restore past conditions that no longer exist, but must instead adopt a "bankruptcy management" approach – one that reframes water governance as a long-term challenge shaped by justice, security and political economy dynamics, rather than a problem that can be solved through technical fixes alone (**Madani 2026**).

It is also equally a biodiversity challenge. According to World Wildlife Fund's (WWF) latest Living Legacy report, 85% of global freshwater species populations have been lost between 1970 and 2020, equating to an average annual loss of 4% globally (**WWF 2024**). These declines were higher than those in both terrestrial and oceanic environments. Such declines in biodiversity weaken these ecosystem functions, reducing the capacity of freshwater systems to buffer climate extremes such as floods and droughts (**IPBES 2024**). As a result, degraded ecosystems are less able to regulate water availability and quality, undermining water security, food systems and economic stability. With only 0.5% of the Earth's water accessible for human use, global water scarcity is projected to intensify as climate change accelerates and populations grow, adding pressure to the already 2 billion people who currently lack safe drinking water (**UN Climate Action n.d.**).

In this context, Nature-based Solutions (NbS)[1] offer a practical and proven pathway to strengthening water resilience and securing sustainable access to resources. By restoring and managing ecosystems such as wetlands, watersheds and aquifers as natural infrastructure, NbS help regulate water flows, reduce climate risks and support livelihoods, while delivering co-benefits for biodiversity and economies. Their strength lies in their ability to be integrated into existing water management systems, scaled across landscapes and tailored to local contexts – particularly when co-designed with communities, including women and marginalized groups, to ensure lasting and sustainable impact.


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WHERE NBS AND EQUITY CONVERGE

NbS for climate adaptation offer the opportunity to strengthen water systems while addressing deeply unequal access to water and sanitation. For many women and girls, water is not only a resource issue but one of access, safety, and dignity (**UN Water n.d.**). Every day, women and girls collectively spend 200 million hours, or over 22,800 years, collecting water (**UNICEF 2026** in **IUCN 2024**).

[1] Actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services and resilience and biodiversity benefits (UNEA-5 2020 Resolution).

They disproportionately bear the burden of water collection – often traveling long distances, facing physical strain and risk of violence – while inadequate sanitation and lack of safe, private facilities compromise health, education and income opportunities.

Resilience, therefore, is both ecological and social. Integrating a gender lens into NbS design ensures that interventions explicitly address these inequalities, reducing vulnerability, redistributing labor burdens and improving access to water resources and decision-making. When NbS are intentionally designed to be gender-responsive and inclusive, they not only restore ecosystems but also strengthen agency, shift decision-making power and improve long-term sustainability and uptake of solutions.

There are several pathways through which gender-responsive NbS approaches strengthen both equity and effectiveness. First, improving the availability and quality of local water resources through ecosystem restoration can significantly reduce the time and labour associated with water collection, freeing up time for education, livelihoods and community leadership. Second, targeted measures, such as capacity-building, dedicated financing streams, accommodations (e.g. childcare services) and support to women's collectives, enable women to move from beneficiaries to leaders in the design and delivery of NbS. Third, inclusive governance structures ensure that water management decisions reflect the needs and priorities of all users, leading to more contextually appropriate and widely adopted solutions. Explore the case studies in this brief to see how these approaches come to life in practice.

IUCN's BRIDGE (Building River Dialogue and Governance) Initiative has recently announced the recipients of Gender Mainstreaming Grants and Women Leadership Grants across the world, a dedicated financing stream for women to support and promote equity, access to resources and leadership. **Learn more** about the recipients and how they seek to foster resilient freshwater ecosystems.

When these elements are embedded from the outset, NbS not only restore ecosystems but also strengthen agency, shift decision-making power and enhance the long-term sustainability of adaptation efforts. Conversely, without deliberate attention to gender and social inclusion, NbS risk reinforcing existing inequalities, limiting both their reach and their impact.

ALL HANDS ON THE WATERSHED

Resilient waterscapes depend on governance systems that are participatory, inclusive and attuned to the interconnected nature of freshwater ecosystems. Rivers, wetlands and aquifers link communities across entire landscapes, meaning that decisions made upstream inevitably affect those downstream. Effective climate adaptation therefore requires governance models that bring together diverse stakeholders across the landscape, including local communities, government institutions, civil society, academia and the private sector, to collectively manage shared water resources.

For transboundary ecosystems, this is critical to effective water bankruptcy management. Initiatives, such as **IUCN's BRIDGE Initiative**, demonstrate how cooperation over shared water resources can mobilise actors at the local level, strengthening resilience, building trust and ensuring more equitable and sustainable outcomes. BRIDGE prioritises inclusive and informed participation and decision-making, especially from marginalised communities.

Inclusive water governance is not only a matter of representation, but of effectiveness. When women, Indigenous Peoples, youth and other under-represented groups are meaningfully engaged in decision-making, water management systems become more equitable and better adapted to local realities. Inclusive water-sharing frameworks or interventions also help reduce conflicts, which can escalate without coordinated, participatory governance that brings all stakeholders, including marginalised communities, into the process.

Experiences from BRIDGE in the transboundary Mano River of Guinea and Liberia demonstrate that, in an area heavily marked by civil war,

Case Study 1

A Global EbA Fund **project in Siphandone Wetland, Laos PDR**, implemented by WWF, strengthens wetland governance by engaging communities, including women, in participatory climate-risk planning and management. Women play an active role in EbA governance, representing a significant share of Village Development Fund loan recipients and committee members, which supports both their livelihoods and leadership. Building on a Multi-Sectoral EbA Action Plan and enhanced collaboration between government and local authorities, communities are leading efforts to restore and manage wetlands that regulate water flows. Supported by increased EbA capacity among more than 90 participants and the integration of EbA priorities into local planning frameworks, these actions are improving ecosystem health while strengthening community preparedness for climate risks.

distrust and accusations of boundary crossing, women organised an exchange system between fishing groups across borders to establish dedicated fishing days so that women from each side were able to obtain their catch without impeding others (**IUCN 2018**).

This example underscores that effective water management requires the meaningful inclusion of all stakeholders, particularly those whose lived experiences shape daily interactions with water systems. Ensuring that women, Indigenous peoples, youth and local communities are actively engaged in decision-making and resource

governance not only strengthens cooperation across borders, but also enhances relevance, equity and long-term success of adaptation efforts.


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LETTING LOCAL LEADERSHIP FLOW

Across diverse contexts, communities are not only beneficiaries of NbS, they are leaders in their design, implementation and monitoring. Locally driven action is proving essential to restoring freshwater ecosystems while addressing water-related climate risks such as flooding, drought, and water scarcity.

Communities – recognizing they are not homogeneous and require an intersectional lens – must co-design NbS interventions to ensure solutions align with diverse local priorities, knowledge systems and environmental conditions. This fosters stronger ownership, increases uptake and enhances long-term sustainability. Community-led and locally-led approaches also create space for innovation, as local actors adapt traditional practices and experiment with new techniques to respond to evolving climate challenges. Centering women's knowledge and leadership is particularly critical. Gender-responsive approaches that elevate women's participation and decision-making power not only promote equity, but also lead to more effective and widely adopted solutions.

Case Study 2

Through another Global EbA Fund supported **project in southwest Bangladesh**, implemented by BothENDS, CEGIS and Uttaran, advances in Community-Based Tidal River Management (CBTRM) have empowered communities, strengthened inclusive governance, and mobilised investment to restore river ecosystems and build resilience to climate and water-related risks. The project also placed strong emphasis on gender justice by actively including women, landless households, and other marginalised groups in the People's Plan for CBTRM, ensuring their voices shaped key decisions. Engaging women and adolescent girls in Paani Committees strengthened local advocacy and made climate-related hardships such as waterlogging more visible in community dialogues. More than 1,500 community members and 75 government officials have been engaged through awareness-raising, planning and capacity-building efforts, leading to the formation of the Betna-Marichhap River Protection Committee and stronger government support for CBTRM. Field evidence and mapping of viable floodplains have further reinforced the case for CBTRM and informed the locally endorsed People's Plan.


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Case Study 3

Meaning "flexibility" in Arabic, Al Munrunah, a **project implemented in the MENA Region** by the International Water Management Institute (IWMI) and IUCN, and financed by the UK Government, implements integrated resilient nature-based water solutions (RNBWS) to support water and agricultural water management and promote climate adaptation. Al-Murunah works alongside women-led organisations to revive the cultivation of prized terroir crops, such as Roman olive and blue fig in Jordan, while also promoting sustainable agriculture practices to sustain women-led value chains, such as artichokes, and access to finance in Egypt.

Case Study 4

The Art and Litter Traps Initiative of the NAbSA supported **SUNCASA project** combines environmental restoration, local livelihoods, activism and artistic expression in Alexandra township (Johannesburg, South Africa), a community shaped by the legacy of apartheid-era spatial and economic inequalities. Working with local women artisans to weave recyclable materials into litter traps, this work is transforming urban waste into interactive, public sculptures that reflect the hope and lived experiences of the people of Alexandra. In harvesting debris from the Jukskei River, a highly urbanized river system significantly impacted by sewage and urban runoff, the River Creature Series is helping to reduce waste blockages, improve river flow and lower flood risk, while fostering tourism, creating jobs, changing stigmatized public image and strengthening community stewardship of the river system. The project is implemented by the International Institute for Sustainable Development (IISD) and the World Resources Institute (WRI).

Photo description: **The River Fish**: A Living Litter Trap. Artists: Samiksha Singh, Hannelie Coetzee, and Solomon Ndlovu. Woven by the Kula Marolen Foundation. This woven sculpture, with a bathtub salvaged from the river, traps plastic debris. Inspired by filter-feeding fish.

CONNECTING THE DROPS: WATER RESILIENCE ACROSS LANDSCAPES

Scaling water resilience requires moving beyond isolated interventions to coordinated action across entire landscapes and water systems. From highland catchments to floodplains and coastal deltas, the water cycle links ecosystems, sectors and communities, meaning that effective NbS must be designed and implemented across this full continuum.

Integrated watershed approaches operationalize this connectivity by aligning policies, investments and community priorities across the water continuum. This ensures that upstream actions, such as ecosystem restoration, translate into downstream benefits, including improved water availability, reduced flood risks and enhanced livelihoods. At this scale, understanding the social dimensions of water use becomes critical. Gender roles often shape how water is accessed and used – for example, women in domestic water collection and men in irrigation.

Without careful design, large-scale interventions risk reinforcing existing inequalities. Integrating gender-responsive approaches ensures that benefits are equitably distributed and that scaling NbS does not replicate or deepen structural disparities and inequalities.

Thandokule Zungu, a project manager with SUNCASA's partner Alexandra Water Warriors in Johannesburg, explained that "the answer is simple, but not easy. Show up. Listen. Stay. Co-create." **Read more** about this initiative and learn directly from Thandokule Zungu by listening to her presentation during **IUCN's Nature, Climate & Gender Symposium**, organised by NAbSA, the Global EbA Fund and **PODONG Indigenous Peoples Initiative**.

Case Study 5

Supported by the Global EbA Fund and implemented by IWMI, this **project in Vietnam** co-designs and implements managed aquifer recharge (MAR) systems with farmers to increase groundwater availability during drought. It integrates groundwater recharge within broader watershed management and aligns actors across government, farmers and private sector partners (including Tchibo). Project activities are reaching 12,000 direct beneficiaries, over half of whom are women. To ensure the project reflects community needs, IWMI conducted segmented discussions that allowed women and ethnic minority farmers to speak freely, revealing that women experience water stress differently as they manage household water and face early failure of shallow domestic wells. The project also facilitated multi-stakeholder dialogues among the government, communities, and the private sector to advance nature-based water management solutions, strengthening collaboration around MAR implementation.

FUNDING THE FLOW: SCALING NATURE-BASED WATER SOLUTIONS

Recent integrated cost benefit analyses of SUNCASA NbS in the **Dechatu** (Dire Dawa, Ethiopia), **Nyabarongo** (Kigali, Rwanda) and **Jukskei** (Johannesburg, South Africa) river catchments show strong returns on investment. In general, value is generated by NbS through job creation, reduced flood damage, health savings, and improved ecosystem services.

These findings build the economic case for scaling NbS as a core climate adaptation strategy.

As explained in **NAbSA's Investing in Impact** brief, such scaling requires aligned investment, enabling policy environments and cross-sector collaboration. Governments, communities and the private sector all play a role in mobilizing the resources needed to expand nature-based water solutions.

Co-investment models are particularly effective, as they distribute risks and align incentives across stakeholders. When combined with enabling environments, such as supportive policies, robust data systems and inclusive governance, these models accelerate the uptake and long-term impact of NbS. Integrating gender equality into financing and policy frameworks further enhances outcomes by ensuring that investments address structural inequalities and expand participation.

Ultimately, scaling gender-responsive NbS for water resilience is not only a technical challenge, but a collective one – requiring aligned finance, inclusive governance and long-term commitment to both ecosystems and people.

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