The Nature Conservancy

World Health Organization

BRIEF #2
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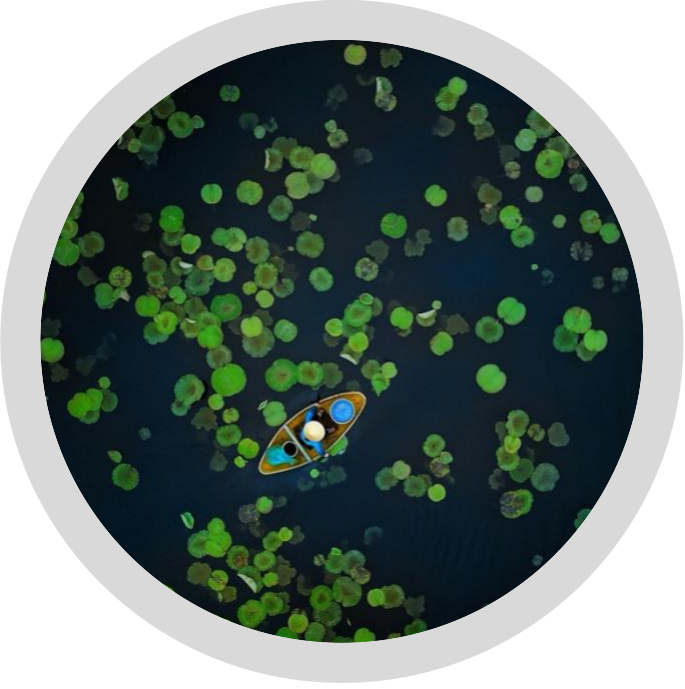
Protecting Health and Biodiversity through Nature-based Solutions

ALIGNING HEALTH SYSTEMS, BIODIVERSITY CONSERVATION, AND CLIMATE RESILIENCE

Key Messages

- Nature-based solutions (NbS) are interventions that support biodiversity conservation, climate resilience, and social well-being, while delivering a wide array of potential health benefits. NbS also offer an integrative pathway for advancing "One Health," addressing the interconnected health of people, plants, animals and ecosystems.
- Biodiversity underpins life on Earth, with many direct and indirect connections to health, but is threatened by rapid ecosystem degradation, habitat loss, and species declines that in turn affects ecosystem functions and services.
- Health sector leadership, research, capacity strengthening, policy coherence, and guidance would be beneficial for scaling health-positive, nature-based solutions in line with the Global Action Plan on Biodiversity and Health and the Global Action Plan on Climate Change and Health.
- There is need for countries to identify and address environmental risk factors for disease and assess the role of NbS in health protection.
- A robust evidence base that integrates various forms of knowledge on NbS, including scientific data and Indigenous Knowledge systems, is essential to guiding biodiversity and health outcomes. Recognizing that NbS have been tested, refined, and sustained for millennia by Indigenous Peoples, such approaches offer a holistic understanding of health that extends beyond single health outcomes.
- Equitable NbS require centering Indigenous Peoples as rights holders and supporting their leadership in the development and implementation of NbS initiatives. They must also meaningfully include the leadership of women, youth, and other underrepresented or marginalized groups in decision-making and benefit-sharing processes.

Introduction



Human health is deeply interlinked with biodiversity.[1] The variety of life on Earth and the ecosystem services it sustains play an essential role in making our planet an environment in which we can thrive. Yet, biodiversity is rapidly declining: recent estimates show that up to a million species face extinction threats—many within the coming decades. Biodiversity loss threatens multiple essential services that nature provides to people, including pollination, pest and disease vector control, soil fertility, medicines, air and water purification, and climate regulation, with consequences for human health. The biodiversity, climate, and health crises are interconnected, with direct and indirect effects on human lives. The burden of disease attributed to preventable environmental risk factors—nearly one-fourth of deaths globally—reflects the unhealthy state of our environment.[2] Biodiversity loss is not solely about resource depletion and a loss of

services. It represents a breakdown in relationships and responsibilities between people and nature.

"One Health" is an integrated, unifying approach to policy and practice that recognizes that the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and interdependent.[3] One Health is built on underlying principles that recognize the importance of biodiversity, the stewardship of natural resources, and the importance of Western and traditional knowledge forms. Indigenous Sciences and relational health frameworks deepen this perspective by emphasizing that health is not only an individual outcome but a reflection of our relationships with people, lands, waters, and other living beings. Part of the Quadripartite One Health Joint Plan of Action emphasizes environment and health connections and recognizes the promise of NbS.[4]

VALUE OF WETLANDS FOR PUBLIC HEALTH

Inland and coastal wetlands include a range of ecosystem types, including mangroves, marshes, coral reefs, lakes, rivers, and peatlands, and contribute to health in numerous ways. The degradation of wetlands has led to at least a 22% decline in global wetland coverage since 1970, increasing waterborne diseases and reducing water availability for over 2 billion people. Protecting and restoring wetlands and natural water flows contribute to health protection through numerous mechanisms, most directly via water supply and water filtration, reduced risk of injury or destruction from flood events, provision of food and traditional medicines, and recreation.

Nature-Based Solutions for Biodiversity and Health

Nature-based Solutions (NbS) offer an underutilized yet powerful set of actions to address climate change, biodiversity loss, and public health with key entry points for One Health and health sector adaptation *(see Table 1)*. NbS for health are defined as "actions to protect, sustainably manage and restore natural or modified ecosystems, which address societal challenges (e.g., climate change, food and water security, or natural disasters)." [5]

The recent report on Nature-based Solutions for Health, produced by the World Health Organization (WHO) and the International Union for Conservation of Nature (IUCN), uses real-world examples to demonstrate the opportunities for linking ecosystem integrity and stewardship with better health outcomes, emphasizing the role of NbS.[6] From Indigenous perspectives, NbS are not only technical interventions but also living practices that sustain, renew, honor, and restore long-standing relationships between

communities and the lands and ecosystems they inhabit and steward.

Despite their transformative potential, most NbS are often designed around a narrow set of climate or biodiversity objectives, with public health benefits either unmeasured or absent from design and financing frameworks.

While health sector actors are rarely involved in NbS planning, and ecosystem approaches are often absent from health policy and infrastructure, notable progress has emerged in collaborations between health and urban forestry to address heat-related challenges and the growing linkages between traditional and Western medicine and health systems. Unlocking the full potential of NbS for health requires holistic, cross-sectoral approaches, guided by local and international knowledge-action and global frameworks such as the Kunming-Montreal Global Biodiversity Framework, the WHO Global Action Plan on Climate Change and Health, and the Sustainable Development Goals.

When explicitly designed with human health in mind, NbS address a wide range of health challenges, including emerging infectious diseases, noncommunicable diseases, maternal and child health, mental health, and water and food security, offering scalable, potentially cost-effective strategies for prevention, resilience, and well-being. Through climate change mitigation and adaptation, NbS also help to protect critical health and transit infrastructure and thus access to services, advancing Health for All and supporting universal health coverage.

SOURCE: ADAPTED FROM WHO-IUCN, 2024.

TABLE 1: Illustrative Health Domains and Nature-based Solutions for Health

Health Domain	Examples of Nature-based Solutions (NbS)	Health Benefit Pathway
Noncommunicable Diseases (NCDs)	Greening for heat and air pollution mitigation; nature exposure for immune regulation; buffers and chemical runoff filtration	Lowers cardiovascular, respiratory disease, and diabetes risk; reduces air pollution; enhances immune system balance
Maternal and Child Health	Wildfire risk reduction to reduce smoke exposure; Watershed protection; nutrition-sensitive agroecology; heat mitigation	Improves pregnancy outcomes and birth weight; reduces maternal stress and waterborne illness risk
Food and Nutrition Security	Agroecological farming; biodiversity-based diets; pollinator habitat protection	Enhances food diversity, access, and nutritional value; reduces dependency on ultra-processed foods
Mental Health & Cognitive Development	Nature prescriptions; biocultural landscapes; cultural forests and healing gardens	Reduces stress, anxiety, depression; supports identity, trauma recovery, and childhood development
Traditional Medicine & Medicinal Biodiversity	Conservation of medicinal plants; rights-based approaches to Indigenous traditional knowledge and medicine; protection of sacred natural sites and knowledge systems	Ensures access to culturally important remedies; supports primary healthcare in remote areas; supports biodiversity and rights-based approaches to health and equity
Soil Health & Food Safety	Regenerative agriculture; soil microbiome restoration	Reduces exposure to contaminants; enhances crop nutrient density and antimicrobial resistance prevention
Air Quality & Respiratory Health	Urban tree planting, green roofs, and buffer strips; no-burn crop residue management	Filters air pollutants (PM2.5, NO_2); lowers risk of asthma and respiratory infections
Waterborne Diseases (human and animal)	Riparian buffers; wetland and watershed restoration	Improves surface and groundwater quality; reduces diarrheal diseases and agricultural runoff
Infectious Diseases (vector-borne, zoonotic, parasitic, food- & waterborne)	Forest conservation to reduce zoonotic spillover; agroforestry to limit foodborne pathogens; wetland waterflow restoration for vector control	Reduces pathogen transmission risk; buffers animal-human contact zones; improves water quality and food safety
Health System Resilience & Disaster Risk Reduction	Mangrove and coral reef protection, reforestation, wetland restoration; wildfire risk reduction	Buffers extreme weather, floods, and heatwaves; protects health infrastructure and access to care
Cultural, Spiritual, and Relational Health	Protection of cultural keystone species; Indigenous-managed ecosystems	Fosters well-being, spiritual connection, relational health, and community cohesion

PRACTICES AND PRIORITIES FOR DESIGNING HEALTH-RELEVANT NATURE-BASED SOLUTIONS

Effective NbS for health must be grounded in a set of guiding principles that ensure interventions are equitable, context-specific, and capable of delivering long-term, measurable co-benefits across health, environment, and related sectors.

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NECESSARY PRINCIPLES TO EFFECTIVE AND EQUITABLE SCALING OF NATURE-BASED SOLUTIONS

The 2024 WHO-IUCN report on NbS for health identifies several principles necessary to effective and equitable scaling of solutions. These principles are well aligned with related global frameworks such as the Kunming-Montreal Global Biodiversity Framework, the Sustainable Development Goals, and One Health:

- **Prevention at Source:** Design interventions that address the ecological and social determinants of health before harm occurs, reducing exposure to environmental risks and preventing disease emergence. This includes addressing drivers such as deforestation, ecosystem degradation, and pollution.
- **Co-Design and Co-Benefits:** Engage communities, Indigenous Peoples, and local knowledge holders from the outset and on an ongoing basis to ensure interventions are locally relevant, culturally appropriate, and designed to generate multiple benefits for health, climate resilience, biodiversity conservation, and livelihoods, and to maintain shared responsibility and long-term care for place.
- **Equity and Rights-Based Approaches:** Center Indigenous Peoples as rights holders, as well as women, youth, and other underrepresented or marginalized groups in planning, governance, and benefit-sharing. NbS must uphold free, prior and informed consent (FPIC) and contribute to intergenerational equity and social justice. Rights-based approaches are inseparable from responsibilities to land, water, and future generations.
- **Systems Integration:** Embed NbS within broader cross-sectoral strategies by aligning with frameworks such as One Health, Planetary Health, and EcoHealth. This requires coordination across health, agriculture, environment, water, and urban planning to ensure coherent policy and programmatic action.
- **Plural Knowledge Systems:** Bridge scientific, traditional, and experiential knowledge systems to inform design, monitoring, and evaluation. Recognizing diverse worldviews and fostering mutual learning strengthens both the legitimacy and the effectiveness of NbS for health and respects distinct ways of knowing, being, and governing.

POLICY PRIORITIES FOR SCALING NATURE-BASED SOLUTIONS FOR HEALTH

To scale NbS for health requires governments, health actors, and partners to institutionalize health considerations across biodiversity, climate, and development agendas. This includes embedding health metrics, mobilizing health sector engagement, and advancing rights-based governance frameworks.

The Nature Conservancy's recent report, "The Power of Policy: Creating the conditions to scale nature-based solutions for water security," identifies policy as an essential enabling condition that is necessary, but not sufficient, to effectively deploy NbS.[7] Regulation, cross-jurisdictional or cross-sector circumstances, financing, and community support and leadership can shape necessary conditions. And policies for NbS adoption are embedded in political, financial, and social systems, making effective policy design a highly bespoke process. Nonetheless, there are some recommended actions to enable effective NbS for health.

- **Address environmental determinants of health:** Policy should characterize the environmental drivers of disease and assess ways that NbS can play a role in reducing disease risks and burdens. This shift can help move beyond predominant focus on disease response toward upstream health protection opportunities, aligned with the recognized right to a clean, healthy, and sustainable environment.
- **Integrate health metrics and monitoring:** Policy should ensure that public health indicators—such as disease prevention, mental health outcomes, maternal and child health, and food and water security—are embedded in NbS planning, evaluation, and financing. This supports evidence-based implementation and aligns with prevention-at-source principles.
- **Strengthen health sector engagement:** Build institutional and technical capacity within ministries of health, public health agencies, and health systems to recognize, co-design, and champion NbS. Health actors should be integrated into biodiversity, climate, and other environmental policy processes, particularly through One Health coordination mechanisms. Engagement should also reflect the importance of traditional medicine systems and practitioners, where relevant, as a part of community-based knowledge systems and health service delivery linked to nature, culture, and disease prevention.
- **Acknowledge nature as a health asset:** Encourage research and documentation on biodiversity, ecosystems, and health connections, including how biodiversity contributes to community health assets (for example, as nutrition, medicine, water availability, and mental health). As part of health system planning and investments, examine how restoration of degraded ecosystems and conservation of functional ecosystems contribute to the protection of health infrastructure and availability of health services.

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- **Support equity and rights-based governance:** Policy should uphold the Universal Declaration on the Rights of Indigenous Peoples (UNDRIP) and ensure that Indigenous Peoples, women, youth, and vulnerable communities are not only included but empowered as co-creators and decision-makers in planning, implementation, and governance of NbS. All efforts should respect FPIC principles.
- **Promote strategic, cross-sectoral investment:** Develop and deploy financing mechanisms that recognize the health, climate, and biodiversity multi-benefit nature of NbS. This includes aligning public investment with development priorities, incentivizing innovation, and leveraging multilateral and climate finance (e.g., GEF, GCF, adaptation funds, etc.).
- **Institutionalize cross-sectoral coordination:** Policy can also be used to strengthen governance structures that bridge health, environment, agriculture, water, and urban planning. Whole-of-government and whole-of-society approaches—including national One Health platforms—are critical to maximize synergies and reduce fragmentation.
- **Enable community-led and Indigenous-led NbS:** Policy can support investment in locally appropriate, culturally grounded NbS that reflect traditional knowledge systems and community-defined priorities. This can enhance health and climate resilience, safeguard biocultural diversity, and promote relational well-being across generations.

Taken together, these policy priorities lay the foundation for a systemic shift toward prevention-oriented, equity-driven, and health-integrated NbS strategies, aligned with the Kunming-Montreal Global Biodiversity Framework, the Sustainable Development Goals, and the Global Action Plans on Biodiversity and Health and Climate Change and Health.

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BRIDGING THE EVIDENCE GAP

Despite growing momentum for nature-based approaches, health remains poorly integrated into the design, monitoring, and financing of NbS. Standardized health metrics are often lacking, and critical areas—including mental health, maternal and child health, neglected diseases, soil- and waterborne illnesses—receive limited attention. Disaggregated data across gender, age, Indigenous identity, and social determinants is rarely collected, constraining efforts to assess equity and inclusion and differentiated health impacts and undermines our ability to maximize the potential of NbS.

As with other types of health interventions, building a robust and inclusive evidence base on the links between biodiversity, ecosystem, and health is important to inform investments in NbS to yield health gains. Evidence generation can identify pathways of impact, help avoid potential trade-offs, and generate multiple benefits for people, biodiversity, and climate.

Some NbS have a rapidly growing body of scientific findings (e.g., health effects of urban greening or time in nature). In addition, many NbS have been tested and refined through thousands of years of Indigenous practices, providing robust existing knowledge bases and reinforcing the value of multiple forms and sources of knowledge.

Currently, only 41% of Health National Adaptation Plans (H-NAPs)—and even fewer overall National Adaptation Plans—include adaptation actions aligned to managing environmental determinants of health.[8] Generating availability of evidence on NbS for health will help to inform ways to address environmental risk factors for disease burden.

GLOBAL GOALS AND POLICY COHERENCE

Momentum is growing to position NbS as a central strategy for advancing biodiversity conservation, climate resilience, and public health. The Kunming-Montreal Global Biodiversity Framework, adopted in 2022 under the Convention on Biological Diversity, sets out a shared vision of living in harmony with nature by 2050 and includes several targets directly aligned with NbS for health. Complementing this, the Global Action Plan on Biodiversity and Health, adopted at the CBD COP16 in 2024, promotes cross-sectoral approaches that recognize biodiversity as foundational to human health and health system resilience. It calls for One Health integration, rights-based approaches, and prevention at source, with explicit attention to equity, including the participation of Indigenous Peoples, local communities, women, and youth. It also encourages the designation of biodiversity and health focal points.

The Global Action Plan on Climate Change and Health (2025–2028), adopted at the 78th World Health Assembly, represents a landmark commitment to strengthening health system resilience, early warning systems, and community-led adaptation. While biodiversity and ecosystem services are not explicitly referenced, the Plan's emphasis on prevention, intersectoral coordination, and climate-health integration provides an important platform to embed NbS into national health and climate strategies in ways that offer co-benefits for both biodiversity and health outcomes. Complementing the climate and health Plan with dedicated language and action on biodiversity and ecosystems would strengthen the value of health sector engagement in addressing environmental determinants of health, particularly those linked to the biodiversity crisis and help mobilize the institutional tools and financing needed to scale biodiversity and health collaboration.

NATURE-BASED SOLUTIONS FOR BIODIVERSITY AND HEALTH IN ACTION

Globally, an estimated 60% of people use traditional medicines. Traditional medicine can be considered an NbS, and approaches to ensure the long-term sustainability of medicinal species can also provide biodiversity and ecosystem benefits. For example, in the Ecuadorian Amazon region of Sinangoe, the Cofán Life Nursery and Garden is helping to ensure access to traditional foods and medicines as part of climate-resilient health systems and communities, in ways that respect Indigenous Peoples' rights and knowledge systems.

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NATURE-BASED SOLUTIONS FOR BIODIVERSITY AND HEALTH IN ACTION (CONTINUED)

Invasive alien plant species can crowd out native plant species and suck up water resources, creating water stress for people, livestock, crops, and ecosystems, as well as healthcare facilities. As part of the Greater Cape Town Water Fund, invasive species removal is occurring over 54,000 hectares, including mountainous water catchment areas. This will restore water supply resources, enabling more reliable water safety and security for WASH services and the functioning of health infrastructure.

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Urban greening initiatives—implemented for diverse purposes such as heat and air pollution mitigation, shade, aesthetics, immune system development, restoring wildlife corridors—show promising health outcomes, with a growing number of clinical trials underway. Pursuing biodiversity and health outcomes together in planning and implementation can help to avoid trade-offs that have been noted in some studies.

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Conclusion: Advancing Health through Nature

NbS offer a powerful and underutilized pathway to address the interconnected crises of biodiversity loss, climate change, and growing health inequities. When intentionally designed and governed inclusively, NbS can strengthen health system resilience, restore and safeguard ecosystems, and advance social and climate justice.

To fully realize these benefits, governments, donors, and health and environment leaders must embed health as a core objective—rather than an assumed secondary benefit—of NbS policies and investments. This shift requires moving from reactive to preventive strategies, cross-sectoral metrics, and supporting community and Indigenous-led implementation.

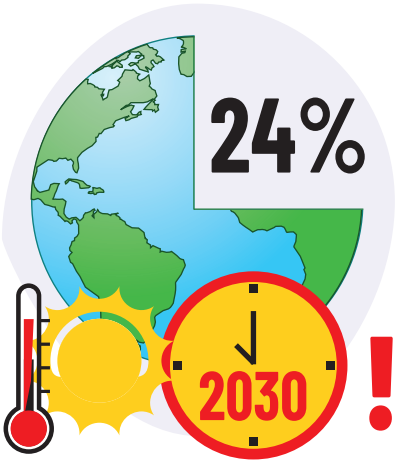
Advancing health through nature requires sustained relationships, not only policy alignment or project investment, but also active health sector participation of environmental determinants of health. As countries implement the Kunming-Montreal Global Biodiversity Framework, the Global Action Plan on Biodiversity and Health, and the Global Action Plan on Climate Change and Health, NbS must be positioned as a key driver of sustainable and equitable transformation.

Protecting Health and Biodiversity through Nature-based Solutions

Current Path

Increased environmental risks and vulnerability, growing burden of disease, declining access to care

Human and Animal Health Systems



Human deaths due to unhealthy environmental conditions

Poor human and animal health status and deaths increasing from climate change

Ecosystems and Climate Systems

Loss of valuable ecosystem functions and services

Communities are less safe and resilient; infrastructure is at risk

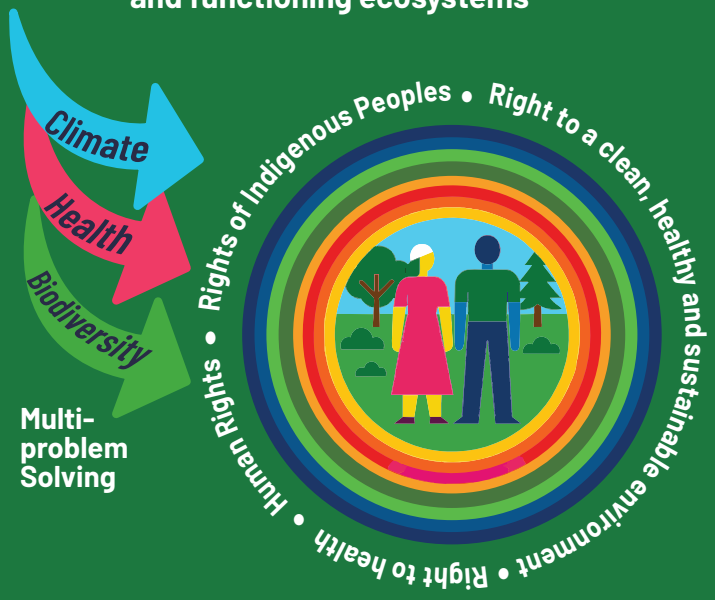
Economic Systems

Costs of adaptation and response are rising, while current investments are insufficient to address the scale of impacts.

Funding Gap
Climate Adaptation:
$187B to $359B per year
Biodiversity:
$598B to $824B per year

A Healthier Future is Possible

Delivering multiple benefits for people: health protection, climate resilience, and functioning ecosystems



Scaling Up Solutions

- Watershed and wetland protection
- Urban greening
- Coastal resilience
- Peatland, grassland and forest restoration
- Regenerative agriculture
- Community-based conservation
- Indigenous stewardship

Scaling Up Health Benefits

- **Direct:** Human and animal lives, health security, and wellbeing
- **Indirect:** Food, water, healthy housing, and income safety and security
- **Reinforcing universal health coverage:** Protecting critical health infrastructure and continuity of care and supply chains

The Nature Conservancy

World Health Organization

Sources: WHO 2018 "Preventing disease through healthy environments: A global assessment of the burden of disease from environmental risks"; FAO 2020 "Animal Health and Climate Change"; UNEP 2024 "Adaptation Gap Report"; The Paulson Institute, The Nature Conservancy, and the Cornell Atkinson Center for Sustainability 2020 "Financing Nature: Closing the global biodiversity financing gap"; IPBES 2024 "Transformative Change Assessment"

ENDNOTES

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