Review of Nature Based Solutions in Various Parts of the World

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Abstract:

Nature based solutions (Nbs) are efficient, nature powered ways that can protect and help manage regional ecosystems like green corridors, mangroves to solve societal problems. By amplifying nature's own defences, they help address the current climate change, like flash floods, unbearable heat, water scarcity, Damage to biodiversity, and local livability issues. Usually artificial means are used to manage these issues which often proves to be expensive whenever there is an occurrence of natural disaster commonly in human settlements that are prone to be affected by them instead Nbs delivers where it matters the most they capture excess carbon, cool overheated places, filters polluted air and water, acts as a shield against disasters, helps revive wildlife habitats, generate green jobs, bolster food and water security, and uplift community health and well-being. This is rooted in indigenous wisdom which are equitable long-term resilience turning into thriving life source for the people and the planet. In Our fast-growing Nation Nbs would spark a positive change that would be beneficial to locals living in the cities and be sustainable if used in more cities. This study reviews recent advances through policies, real-world successes, and practical models. Results show NbS can achieve up to 37% of India's emission cuts while fuelling jobs by Government supported schemes.

These actions sync perfectly with climate commitments taken by the nation and global biodiversity goals, driving adequate sustainability. Cities like Kochi, Bhubaneswar, Chennai, and Bengaluru benefit enormously. These Regions battle heat islands, devastating floods, and water stress on already low budget. NbS actions are proven In Kochi, community planting and urban forests (via WRI-supported projects) have reduced flood risks, reduced temperatures in the neighbourhoods, prevented erosion, and created well-meaning jobs for low-income groups. Bengaluru's green space efforts and Chennai's wetland revival have mitigated wetland loss. But challenges like understudied policies, inadequate funding in research and lack of general awareness remain while they can be done away with reforms at larger scale with implantation of Nbs nationwide.

Keywords: Nature based solutions, Ecosystem, Urban Forest, Green space efforts, Wetland revival.

Introduction

Nature-based solutions, or NbS, take a different path when it comes to solving big problems like climate change, disaster risks, and even economic challenges. Instead of fighting against nature, the idea is to work with it. The International Union for Conservation of Nature (IUCN) describes NbS as actions that protect, manage, and restore ecosystems whether they're wild or already shaped by people. The goal? Support both human well-being and biodiversity while tackling some of our toughest problems head-on.Think of wetlands holding back floodwaters, forests soaking up carbon from the air, or city parks cooling down overheated neighborhoods. These are nature's own defenses, and NbS finds smart ways to use them. It turns out, these solutions often cost less than building walls, dams, or other traditional structures and they usually bring extra benefits too.

Around the world, more people are paying attention to NbS. They've become part of big international promises, like the Paris Agreement and the UN Sustainable Development Goals,Nature-based solutions are a good example. They don't just target one issue they tackle social, environmental, and economic challenges all at once. The International Union for Conservation of Nature came up with this idea to protect, manage, and restore natural ecosystems. Nature-based solutions help both people and wildlife while taking on things like climate change and natural disasters.

Below there are brief mention of implementation of nbs in real examples to show what's possible when we let nature do what it does best.

Global Implementations of Nature-Based Solutions

Nature-based solutions (NbS) are popping up all over the world, in busy cities and quiet rural areas alike. They're adapting to all kinds of ecosystems and economic situations. What makes these projects really work is the way they mix local know-how with scientific methods, so they end up with practical ideas that others can copy for climate resilience. Let's look at a few standout examples.

Take China's "Sponge Cities" project. Since 2015, cities like Wuhan and Shenzhen have swapped out concrete for things like permeable pavements, green roofs, restored wetlands, and rain gardens.

Basically, these changes help soak up rainwater and control flooding, which is a huge issue as cities grow fast. Thanks to these updates, urban runoff has dropped by 40-60% in some urban areas(around 39-42% in wuhan study for normal rainfall yearly) with some national targets with some aimimg for 70% rainwater absorbtion/ reuse in several water prone zones by 2030.

Around Netherlands, where the "Room for the River" project started back in 2007 along the Rhine and Meuse rivers. Instead of just building bigger dikes, they moved dikes back, restored floodplains, and dug side channels. This lets rivers swell safely when water levels rise. The impact? Over 4 million people are better protected from floods, local wildlife is thriving, and people have new places to relax outdoors. flood risks significantly reduced with peak water levels lowered by ~0.3 m on average across interventions.

In the UK, especially in the Scottish Highlands, peatland restoration projects like Glen Affric are making a real difference. They're blocking drainage ditches to rewet bogs and planting native Scots pine trees. helps sequester carbon at rates of several tons per hectare over time plus reduces soil erosion

Over in the African country of kenya, Kitui and other counties, locals are leading the charge on land restoration. Families are planting trees, practicing agroforestry, and building water harvesting basins. These changes are turning the tide against desertification, making the soil richer and boosting food security. Crop yields have grown compared to past years, poverty is down, and other East African countries are starting to follow their lead.

Nature based solutions aren't just ideas on paper they're real, and they're changing lives from city streets to remote fields.

Nature-Based Solutions in India

India moves fast our cities keep growing, and climate change is a ground reality with heatwaves, floods, and water shortages. But the country's not sitting back. It's actually leading the way with nature-based solutions, especially in cities. Government programs like the National Mission for a Green India and AMRUT back these projects, tying local action to bigger global goals for biodiversity.

India's cities blend blue, green, and gray infrastructure. Take Kochi in Kerala. Projects there, some with WRI's help, get communities planting trees and building tiny urban forests. Take the example of Cities4Forests which has brought back mangrooves by cutting down flood risk and cooling down neighborhoods simultaneously planting 10000 new tress to provide shade for the urban area.

Chennai, down in Tamil Nadu, is all about reviving wetlands like the Pallikaranai Marsh. These spots soak up floodwater, recharge groundwater, and act as buffers when heavy rains hit. The city's "Sponge City" projects have already cut flood damage in poorer neighborhoods.

In the busy streets of Bengaluru, the city fights heat by adding parks and bringing lakes back to life. The Million Wells for Bengaluru campaign digs up old wells, which helps keep things cooler and improves water storage. All this work makes the city more livable, even as it keeps growing like crazy.

Nationwide, these projects inspire others to try nature-based solutions. There are groups working to scale up these ideas, tackle hurdles like funding and public awareness, and keep making India's cities greener and more resilient.

Key Benefits of Nature-Based Solutions

Nature based solutions really pull their weight. They don't just beat traditional fixes when it comes to saving money or the environment they connect everything. For starters, they grab and store carbon, which can handle part of India's emission targets. They filter out pollution, bring back lost habitats, and help all kinds of species thrive.Look how urban forests help cool down city hotspots, so people use their air conditioning less compared to their normal usage .

These solutions also create green jobs. Planting, eco-tourism all these offer work, especially where communities need it most. Plus, more green means cleaner air and water, less stress, and better health. Studies back this up: green spaces cut down on heat-related sickness in crowded cities.

On the money side, nature-based solutions cut disaster costs, too. Mangroves, for example, stand strong against floods and save billions in damage.

Conclusion

challenges do remain. Policy gaps and funding still get in the way. But real change is possible. Smarter governance and better incentives can make these solutions work at scale across the country.

In the end, nature-based solutions aren't just about the environment—they're about fairer, stronger communities. Look at China's sponge cities or India's push to bring back urban green spaces. These ideas work worldwide. In India, growing nature-based solutions in more cities means more jobs, real progress on climate goals, and healthier neighborhoods. When we blend in local knowledge and keep building on what works, these solutions can shape a future that's good for both people and the planet.

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