IFRC Global Disaster Preparedness Center

EXECUTIVE SUMMARY

Nature-Based Solutions for Urban Climate Risks:

Assessing Local Engagement, Implementation and Scalability in Bharatpur, Chitwan, Nepal

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Executive Summary

Cities around the world are facing growing risks from climate change, as extreme events become increasingly frequent and intense. Heatwaves, heavy rainfall, floods, and droughts are straining infrastructure, degrading ecosystems, and endangering the health and well-being of urban populations. Bharatpur Metropolitan City, one of Nepal's fastest-growing urban centers, reflects these global challenges at the local scale. Rising temperatures, heavier rainfall, storm-water runoff, and floods are putting pressure on infrastructure, harming public health, and reducing the quality of life for residents. These risks are compounded by rapid, unplanned urban growth, shrinking green spaces, and the loss of natural ecosystems.

In this context, Nature-based Solutions (NbS), actions that use nature to address climate risks, such as urban gardens, street trees, riparian buffers, and public parks, offer cost-effective and sustainable ways to address climate risks while also improving biodiversity, community well-being, and urban livability. This study explored how community-based NbS that are often cheaper than traditional 'grey' infrastructure, are currently implemented in Bharatpur, what benefits they provide, the challenges they face, and how they can be scaled to strengthen resilience in the city and beyond.

What We Did

We combined several approaches:

- Household surveys with over 600 families to understand what people value and need.
- Stakeholder interviews with planners and community leaders.
- Ecological field assessments to measure how well NbS are working.
- Mapping and spatial analysis to see where NbS exist and where more are needed.

This mix gave us both the "hard data" and the community's perspective.

What We Found

1. Community Priorities
    a. Green spaces and urban greenery were the top priority, mentioned 249 times.
    b. Waste and pollution management came next (142 mentions), followed by awareness and participation (62 mentions) and forest/ecosystem protection (61 mentions).
    c. Fewer people raised issues around housing, energy, or governance, showing that residents see NbS as the most practical way to reduce everyday risks.
2. Ecological Benefits
    a. NbS improved storm-water drainage by 15–20% in flood-prone areas.
    b. Tree-dense zones were up to 2.5°C cooler than built-up areas, helping reduce urban heat.
    c. Parks and river buffers created small habitats and corridors that improved urban biodiversity.
3. Social Benefits
    a. Where communities were directly involved in design and management, NbS were more inclusive and better maintained.

    b. These spaces provided areas for recreation, social interaction, and children's play, strengthening neighborhood ties.
    c. Top-down projects, however, often failed to involve marginalized groups and struggled with long-term maintenance.
4. Challenges
    a. Financing: limited budget for NbS projects.
    b. Policy: fragmented frameworks, with little coordination between city plans and national strategies.
    c. Planning: NbS are not yet fully embedded in official urban planning, so "grey" infrastructure is still the default.
    d. Capacity: lack of technical knowledge on site selection, plant species, and long-term upkeep.

Moving Forward

The study produced maps, spatial datasets, and policy briefs to help decision-makers. Based on these, we suggest a four-step framework to scale NbS in Bharatpur and beyond:

1. Raise awareness and build capacity through training and community outreach.
2. Pilot diverse NbS projects to test what works in different neighborhoods.
3. Integrate NbS into formal city planning at both ward and municipal levels.
4. Align with national policies (such as NAP and LAPA) to secure funding and ensure consistency.

Why It Matters

This study shows that community-based NbS are effective, inclusive, and affordable. They reduce climate risks like flooding and heat, improve daily life, and bring nature back into the city. Importantly, they also help Nepal achieve its commitments to the Sustainable Development Goals (SDG 11: Sustainable Cities, SDG 13: Climate Action, and SDG 15: Life on Land).

By embedding NbS into its governance and planning, Bharatpur can become a model city, showing how urban areas across Nepal and the Himalayan region can adapt to climate change while protecting nature and supporting communities.