BALIPARA FOUNDATION

Assam • India

13TH EASTERN HIMALAYAN NATURENOMICS™ FORUM 2025

10th & 11th December
Guwahati, Assam

GAUHATI UNIVERSITY

Recommendations Report

REIMAGINING LAND: FROM DEGRADATION TO REGENERATION

CONTEXT:
WHY THE EASTERN HIMALAYAS MATTER GLOBALLY

The Eastern Himalayas and the greater Hindu Kush Himalayan (HKH) region widely known as the Third Pole constitute one of the most consequential ecological and climatic systems on the planet. Home to the largest reserve of frozen freshwater outside the Arctic and Antarctic, the Third Pole governs the Asian monsoon, feeds transboundary river systems such as the Brahmaputra and the Ganga, and underpins the water, food, and energy security of hundreds of millions of people across South and Southeast Asia. Any destabilisation of this region has cascading consequences far beyond its geographic boundaries.

Deliberations at Gauhati University under the theme Reimagining Land: From Degradation to Regeneration firmly repositioned the Eastern Himalayas not as a peripheral frontier, but as a global climate stabiliser, a biodiversity stronghold, and a socio-economic lifeline for over 50 million people. The discussions underscored that climate change in the Eastern Himalayas is no longer a future scenario; it is a present and accelerating reality manifesting through disrupted hydrological cycles, declining forest integrity, glacier retreat, and the intensification of floods, landslides, and livelihood insecurity. These converging pressures are pushing both ecosystems and communities towards critical thresholds.

Crucially, the dialogue strengthened the narrative beyond mitigation and conservation alone, calling for a decisive shift towards regeneration and resilience. The future of the Third Pole, it was made clear, depends not merely on protecting what remains, but on actively restoring ecological functions, strengthening community-led stewardship, reforming governance frameworks, and realigning development pathways with nature. In this context, land, forests, rivers, and livelihoods must be reimagined as interconnected systems rather than isolated sectors.

These deliberations anchored the Eastern Himalayan Naturenomics™ Forum (EHNF) agenda at a systems level integrating science, policy, indigenous knowledge, community stewardship, and regenerative economics. Together, they established a coherent foundation for long-term climate resilience, ecological regeneration, and inclusive development, positioning the Eastern Himalayas as central to regional stability and global climate futures.


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CONTEXT:
WHY THE EASTERN HIMALAYAS MATTER GLOBALLY

Concerns

01 Land Degradation
02 Forest Loss
03 Soil Erosion
04 Water Stress
05 Glacier Retreat
06 Biodiversity Loss
07 Climate Extremes
08 Flood Risk
09 Landslides
10 Livelihood Insecurity

VS

Solutions

Ecological Restoration 01
Regenerative Land 02
Agroforestry Systems 03
Watershed Recovery 04
Community Stewardship 05
Indigenous Knowledge 06
Science-Based Action 07
Nature-Positive Economies 08
Integrated Governance 09
Climate Resilience 10

The rapidly increasing socio-economic cost of climate change cannot be compensated by the GDP growth model — it demands a fundamental revaluation of how we measure progress and prosperity

-Prof Dr. Nani Gopal Mahanta, Honourable Vice Chancellor, Gauhati University

It is mostly possible that most of the planetary conversations are just repair conversations as it is a complex system and is only going to work when we exclude all hierarchies that exist in the society.

- Sourav Roy, CEO, Tata Steel Foundation

If you live with nature, it will provide you with everything. Indigenous wisdom does exist and it should be used in fields ranging from infrastructure to agriculture.

-Vibha Dhawan,
Director General, TERI

To revive communities in the Eastern Himalaya, we must focus on four key pillars : restoring degraded land, preserving biodiversity, empowering local communities, and strengthening monitoring systems.

-Sunil D'Souza,
CEO, Tata Consumer Products Limited

CHALLENGES IDENTIFIED

Forests

Cover holds.
Quality collapses

Drivers

Infrastructure, fragmentation, invasives, climate stress

Blind Spots

No local baselines.
Weak climate decisions.

Water Truth

Forests supply 80–85% of basin water.

False Fix

Technology without communities fails.

Wrong Models

Plains-based development damages mountains.

CHALLENGES IDENTIFIED

1. **Declining Forest Quality Despite Stable or Rising Forest Cover**

One of the most critical insights from this discussion was the growing concern over the distinction between forest cover and forest quality. While traditional systems rely on satellite data to capture forest growth which may indicate marginal increases in forest area, speakers highlighted a worrying decline in forest density, species diversity, and ecological functionality, especially in the Eastern Himalayas. Some of the key drivers identified across the discussions include:

- Infrastructure expansion (roads, hydropower, transmission lines)
- Fragmentation of habitats
- Invasive species
- Climate-induced stress on vegetation
- Unsustainable land-use transitions

The decline in forest quality has significant implications for ecosystem functioning, diminishing forests' roles in carbon sequestration, hydrological regulation, biodiversity and critical ecosystem services. While overall forest cover figures remain important, they may obscure underlying ecological degradation highlighting the importance of policy frameworks that move beyond area-based metrics toward measures of forest condition and functionality.

2. **Fragmented Knowledge Systems and Incomplete Baseline Data**

While India possesses advanced satellite and remote-sensing capabilities, the discussions revealed a persistent gap between macro-level datasets and micro-level ecological realities. Long-term, location-specific ecological baselines that are essential for distinguishing climate-driven change from human impact remain scarce across much of the Himalayan landscape. The lack of integrated datasets linking forests, hydrology, biodiversity and livelihoods hampers evidence-based decision-making and weakens adaptive governance in a rapidly changing climate.

CHALLENGES IDENTIFIED

3. **Under-recognition of Forests in Water Security Narratives**

A major conceptual gap highlighted was the misattribution of water security primarily to glaciers especially in public discourse. Scientific evidence shows that in basins such as the Brahmaputra and Ganga, 80–85% of water originates from forested catchments, not glaciers alone. Yet policy and investment frameworks continue to prioritise glacial monitoring while underinvesting in forest and watershed restoration particularly in the Eastern Himalayas, which holds a disproportionate share of forest carbon stock and rainfall regulation capacity.

4. **Disconnect Between Technology and Community Stewardship**

Technological tools like remote sensing, GIS, Artificial Intelligence and long-term satellite monitoring were recognised as indispensable to monitoring ecosystems and developing sustainable conservation plans. However, multiple sessions underscored that technology alone cannot deliver conservation outcomes without community participation, local governance and behavioural change. It was highlighted that there remains a structural disconnect between - scientific monitoring systems and the lived realities, knowledge and incentives of local communities. This gap weakens conservation legitimacy and limits long-term sustainability.

5. **Development Paradigms Misaligned with Mountain Ecologies**

A recurring concern was the persistence of top-down “non-mountain-specific development models” in agriculture, infrastructure and livelihoods often imposed on fragile Himalayan landscapes. These approaches often prioritise short-term economic gains at the expense of long-term ecological stability exacerbating landslides, water stress and biodiversity loss.

STRATEGIC RECOMMENDATIONS

1. Shift from Forest Cover Metrics to Forest Quality Governance

Rationale

While forest cover statistics remain an important indicator in monitoring the forest ecosystems and how land use changes, they provide only a partial understanding of the overall ecological health. The capacity of forests to deliver critical ecosystem services such as carbon sequestration, water regulation, soil stabilization, habitat connectivity and climate resilience is determined far more by the forest quality than by area alone. Factors including species diversity, age structure, canopy density and landscape connectivity influence whether forests function as resilient ecological systems or as degraded green cover. In the Eastern Himalayan region, where forests underpin livelihoods, biodiversity, and hydrological security, an overreliance on area-based metrics risks obscuring gradual ecological decline and undermining long-term sustainability goals.

Recommendations

1. Adopt forest quality indicators as core governance metrics by formally incorporating parameters such as species composition, structural diversity, canopy density, regeneration rates, and fragmentation indices into forest monitoring and reporting frameworks.
2. Integrate multi-sectoral data systems by aligning Forest Survey of India (FSI) datasets with biodiversity inventories, hydrological assessments and climate vulnerability data to enable more holistic landscape-level planning.
3. Institutionalise forest quality assessments in development planning mandating ecological condition evaluations as part of environmental clearances for infrastructure, energy, mining and other linear projects across the Himalayan and Northeastern states.
4. Strengthen regional and local monitoring capacities by supporting state forest departments, research institutions, and community-based monitoring systems to generate granular, context-specific forest quality data.
5. Align restoration finance with ecological outcomes, ensuring that public and private investments prioritise improvements in forest function, resilience and connectivity rather than area expansion alone.

Implications

A shift toward forest quality governance would recalibrate conservation and development policy to reflect ecological realities on the ground. By moving beyond headline forest cover figures, policymakers and practitioners would be better equipped to identify degradation hotspots, prioritise restoration investments and design climate adaptation strategies rooted in ecosystem functionality. This approach would also enhance the credibility and effectiveness of India's climate and biodiversity commitments, while strengthening the role of forests as life-support systems for communities across the Eastern Himalayas. Ultimately, governing for forest quality enables a transition from symbolic conservation to outcome-driven ecological stewardship.

STRATEGIC RECOMMENDATIONS

2. Establish Long-Term Ecological Baselines and Monitoring Systems

Rationale

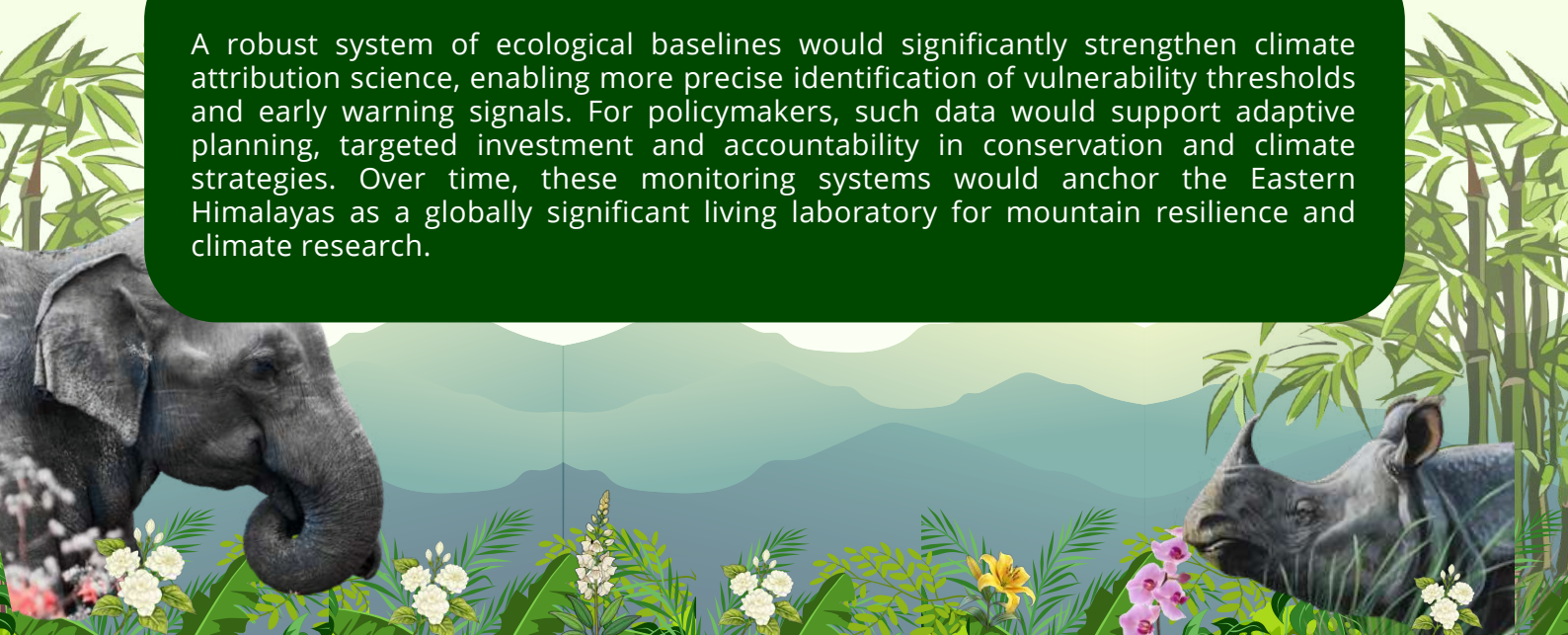
Effective climate adaptation and biodiversity governance depends on the ability to detect change over time and develop measures to address these changes. Across the Eastern Himalayas, however, ecological data remains fragmented, short-term, or project-specific, limiting the capacity to distinguish between natural variability and climate-driven impacts. Without robust long-term baselines, shifts in species distribution, forest health, hydrology and ecosystem functioning remain difficult to attribute or manage proactively. Establishing consistent ecological reference points is therefore essential for translating scientific knowledge into adaptive policy and practice.

Recommendations

1. Create a coordinated network of long-term ecological observatories across representative landscapes of the Eastern Himalayan region covering forests, grasslands, wetlands, agriculture and river systems.
2. Integrate satellite-based monitoring with periodic ground-based ecological ground truthing thus enabling validation of remote sensing data while capturing fine-scale ecological dynamics such as regeneration, species interactions and habitat quality.
3. Position universities and research institutions as regional monitoring hubs, fostering interdisciplinary research, student engagement and long-term data stewardship beyond project cycles.
4. Enable data continuity and comparability through standardised protocols and shared platforms that allow datasets to inform both scientific inquiry and policy decision-making.

Implications

A robust system of ecological baselines would significantly strengthen climate attribution science, enabling more precise identification of vulnerability thresholds and early warning signals. For policymakers, such data would support adaptive planning, targeted investment and accountability in conservation and climate strategies. Over time, these monitoring systems would anchor the Eastern Himalayas as a globally significant living laboratory for mountain resilience and climate research.



STRATEGIC RECOMMENDATIONS

3. Re-centre Forests in Water Security and Climate Adaptation Planning

Rationale

Forested catchments form the hydrological backbone of the Eastern Himalayas, regulating river flows, stabilising slopes, recharging groundwater and buffering communities against floods and droughts. Yet forest-water linkages are often underrepresented in water security and infrastructure planning, which tends to prioritise engineered solutions over ecosystem-based approaches. As climate variability intensifies, neglecting forested landscapes within hydrological planning risks exacerbating disaster vulnerability and water insecurity across downstream regions.

Recommendations

1. Integrate forest conservation and restoration explicitly into river basin and watershed management plans, recognising forests as natural infrastructure essential to water regulation and climate resilience.
2. Prioritise Eastern Himalayan forests within national and state-level water security strategies acknowledging their disproportionate role in sustaining major river systems and downstream economies.
3. Scale up ecosystem-based adaptation (EbA) approaches that link forest restoration with climate-resilient agriculture, soil conservation and livelihood diversification.
4. Encourage cross-sector coordination between forest, water, agriculture, and disaster management agencies to enable landscape-level adaptation planning.

Implications

Re-centering forests within water and climate strategies would enhance hydrological stability, reduce disaster risks and improve long-term water reliability for both rural and urban populations. By delivering co-benefits for biodiversity, livelihoods and climate adaptation, forest-based solutions offer cost-effective and durable alternatives to purely engineered interventions, strengthening resilience across the Himalayan region.

STRATEGIC RECOMMENDATIONS

4. Strengthen Community-Led and Women-Led Conservation Models

Rationale

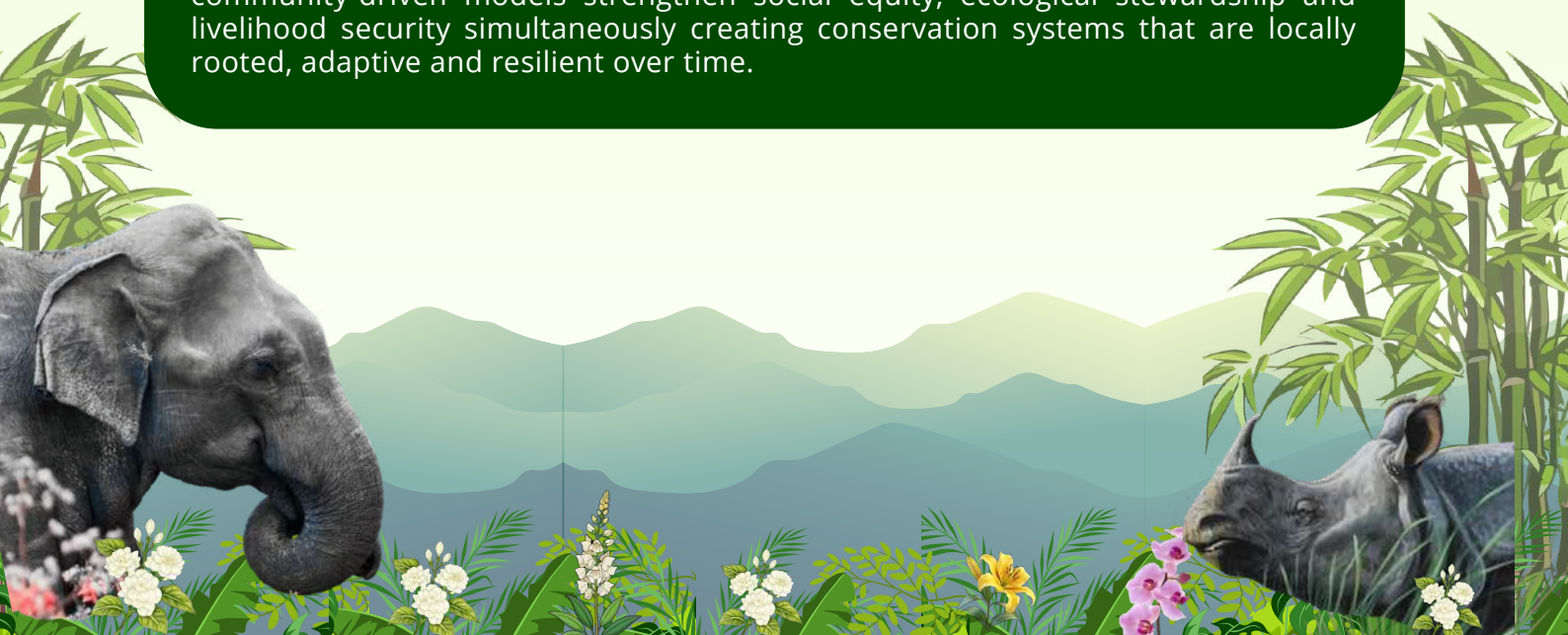
In the Eastern Himalayas, ecological resilience is inseparable from community stewardship. Indigenous and local communities particularly women possess deep ecological knowledge, institutional memory and adaptive practices that have sustained landscapes for generations. However, conservation frameworks have often marginalised these actors, positioning communities as beneficiaries rather than decision-makers. Strengthening community and women-led models is therefore essential to achieving durable, locally legitimate conservation outcomes.

Recommendations

1. Scale up community-based forest management and women-led conservation collectives, drawing on successful models from Nagaland, Assam and other parts of the Northeast.
2. Support nature-based enterprises linked to restoration including nurseries, non-timber forest products (NTFPs), seed banks, eco-restoration services and sustainable tourism initiatives.
3. Formally recognise community roles within conservation governance frameworks, ensuring representation in planning, monitoring and benefit-sharing mechanisms.
4. Enable long-term financial and institutional support moving beyond short-term projects to sustained partnerships with community institutions.

Implications

Empowered communities become active custodians of ecosystems rather than passive stakeholders or perceived obstacles to conservation. Women-led and community-driven models strengthen social equity, ecological stewardship and livelihood security simultaneously creating conservation systems that are locally rooted, adaptive and resilient over time.



STRATEGIC RECOMMENDATIONS

5. Integrate Technology with Local Governance and Capacity Building

Rationale

Technological tools such as remote sensing, GIS and digital monitoring platforms hold immense potential for advancing conservation and climate governance. However, their impact remains limited when they operate in isolation from local institutions and capacities. Bridging the gap between global scientific tools and local governance systems is essential to ensure that technology enhances, rather than replaces, community knowledge and decision-making.

Recommendations

1. Democratise access to technologies critical to ecological monitoring by making GIS, remote sensing, and monitoring tools accessible to state agencies, universities, students and community groups.
2. Invest in capacity building for frontline actors including forest staff, local researchers, youth and community monitors enabling meaningful interpretation and use of data.
3. Develop open-access, interoperable platforms that integrate scientific datasets with community-generated observations and traditional knowledge.
4. Embed technology within governance processes ensuring that data informs planning, accountability and adaptive management rather than remaining purely analytical.

Implications

Integrating technology with local governance enhances transparency, trust and responsiveness in environmental decision-making. By aligning scientific innovation with grassroots capacity, this approach bridges global knowledge systems and local action thus enabling more inclusive, credible and effective conservation outcomes.

STRATEGIC RECOMMENDATIONS

6. Promote Mountain-Specific Development and Livelihood Pathways

Rationale

Mountain ecosystems operate within narrow ecological thresholds and high climate sensitivity. Development models designed for plains or urban regions often destabilise these fragile systems leading to biodiversity loss, livelihood insecurity and increased disaster risks. Sustainable development in the Eastern Himalayas therefore requires approaches tailored to mountain ecologies, cultural contexts and long-term resilience rather than short-term economic gains.

Recommendations

1. Design agriculture, infrastructure and livelihood policies specifically for Himalayan landscapes accounting for slope stability, soil health, biodiversity and climate variability.
2. Promote diversified, low-impact livelihood systems that integrate agroforestry, horticulture, forest-based enterprises and eco-cultural tourism.
3. Avoid externally imposed monocultures and extractive commercial interventions that undermine ecological resilience and local economies.
4. Encourage place-based adaptation/innovation enabling communities to adapt traditional practices with appropriate technology and market access.

Implications

Mountain-specific development pathways ensure economic resilience while safeguarding ecological integrity. By aligning livelihoods with ecological limits, this approach supports sustainable prosperity, reduces vulnerability to climate shocks and preserves the unique socio-ecological fabric of the Eastern Himalayas.

WAY FORWARD

REGENERATIVE SYSTEMS TRANSITION

Adopt Regenerative Governance Frameworks

Shift from asset-based conservation to regeneration-led governance that restores interconnected socio-ecological systems.

Align Policy, Science, and Community Stewardship

Integrate scientific evidence with community-led action to address climate, ecological, and development challenges holistically.

Mobilise Finance for Landscape Regeneration

Channel public and private finance toward long-term, landscape-scale regenerative outcomes.

SHORT-TERM PRIORITIES (1–3 YEARS)

ESTABLISHING THE FOUNDATIONS

01

Recalibrating Governance for Regeneration

Shift institutions and policies to build the foundations for long-term ecological recovery.

02

Build Himalayan Ecological Baselines

Establish long-term observatories linking forests, water, biodiversity, and climate change.

03

Measure What Matters

Move beyond forest area to track forest quality, connectivity, and ecological function.

04

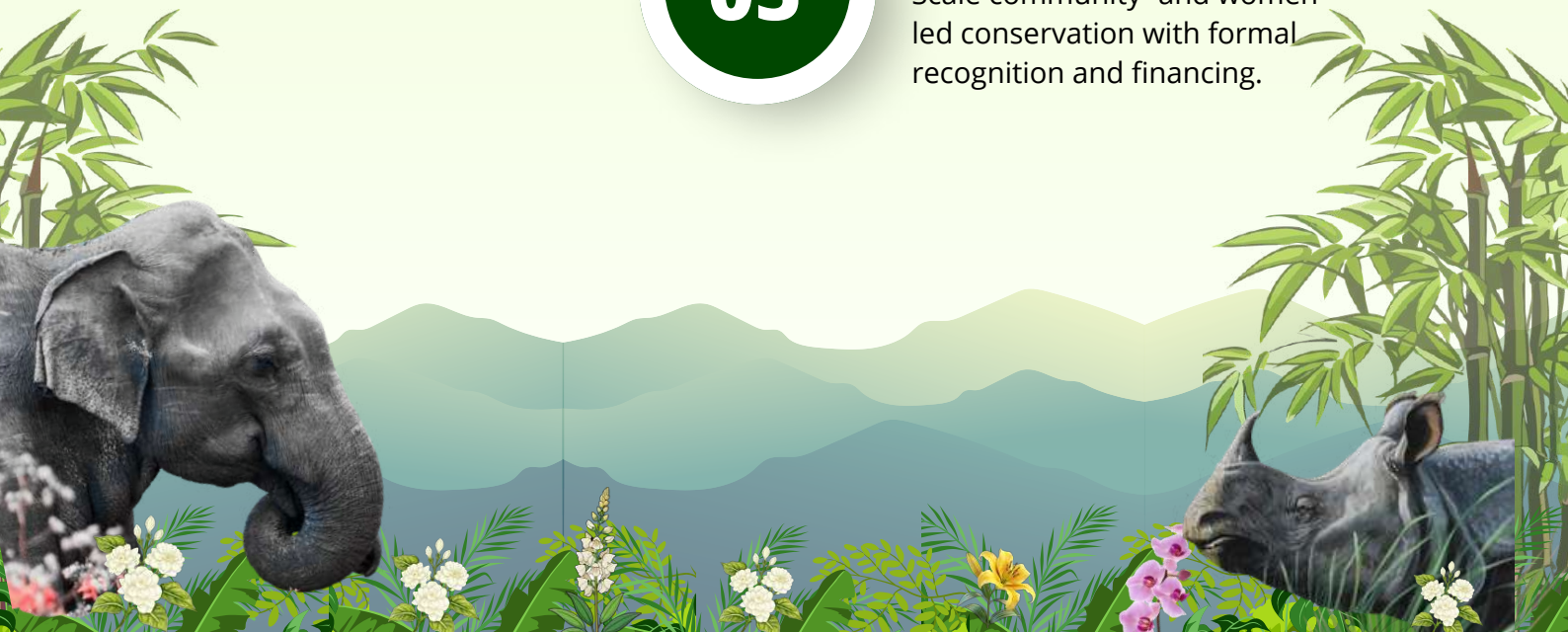
Enable Systems-Level Planning

Break silos through cross-sector platforms spanning forests, water, agriculture, infrastructure, and disaster management.

05

Centre Community Stewardship

Scale community- and women-led conservation with formal recognition and financing.



MEDIUM-TERM PRIORITIES (5–10 YEARS)

EMBEDDING REGENERATION INTO DEVELOPMENT PATHWAYS

01

Institutionalising Regeneration

Embed regeneration across planning, finance, and implementation systems.

02

Nature as Infrastructure

Integrate EbA into development plans, treating ecosystems as foundational assets.

03

Aligned Landscape Governance

Coordinate agencies to align investments with ecological priorities.

04

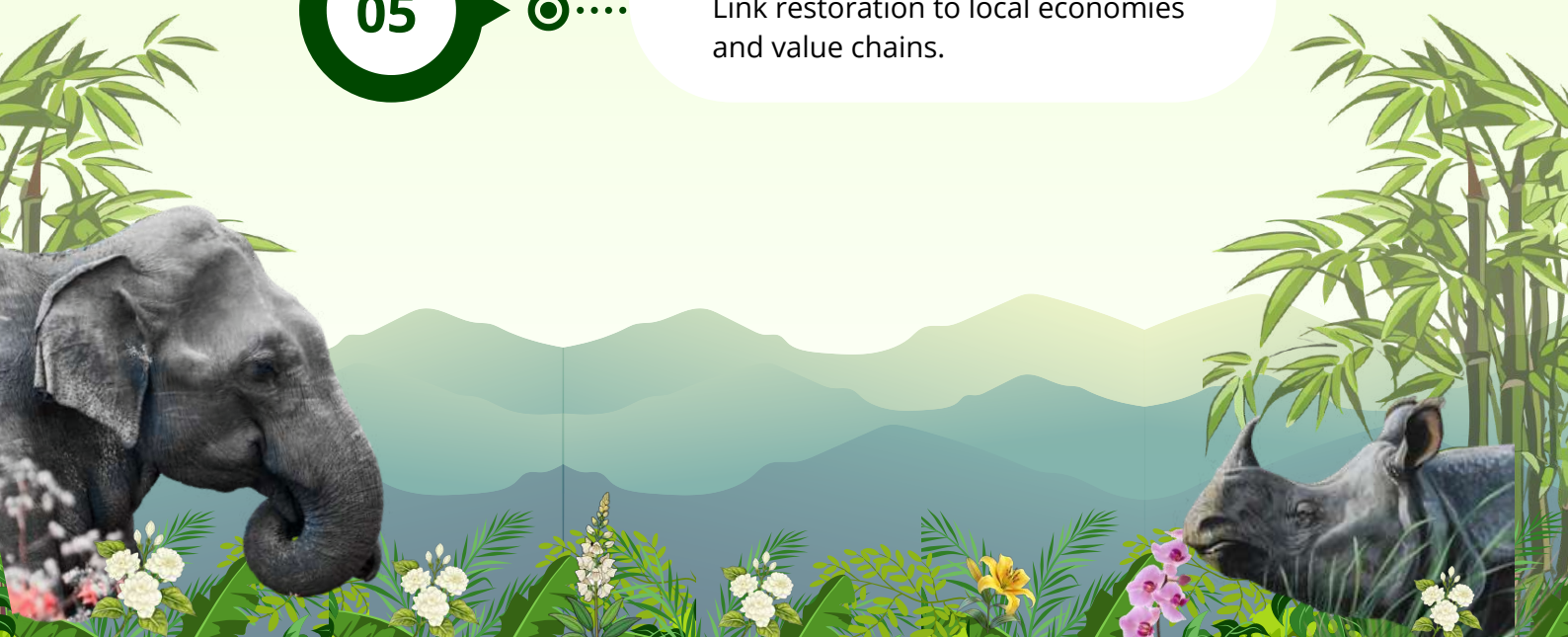
Community-Led Monitoring

Use tech-enabled systems blending science and local knowledge.

05

Regenerative Livelihoods

Link restoration to local economies and value chains.



LONG-TERM VISION (2035–2050)

REGENERATIVE MOUNTAIN FUTURES

01

Eastern Himalaya as a Living Laboratory

Position the region as a model for regenerative governance and resilient mountain systems.

02

Safeguarding the Third Pole

Popularise the Third Pole's role in climate stability, water security, and biodiversity.

03

Development Within Planetary Boundaries

Align growth pathways with ecological limits and intergenerational equity.

04

Transboundary Ecological Cooperation

Strengthen cross-border collaboration recognising shared ecosystems and climate systems.

OUTCOMES FROM PARTNERSHIP WITH GAUHATI UNIVERSITY

01

Launch of the Asian Elephant Secretariat

A centralized, multi-stakeholder platform hosted by the Balipara Foundation to coordinate science, policy, technology, and community-led action for the long-term conservation of the Asian Elephant. The Secretariat strengthens habitat protection, human–elephant conflict mitigation, welfare standards, and regional policy collaboration, positioning Northeast India as a global hub for elephant conservation leadership.

02

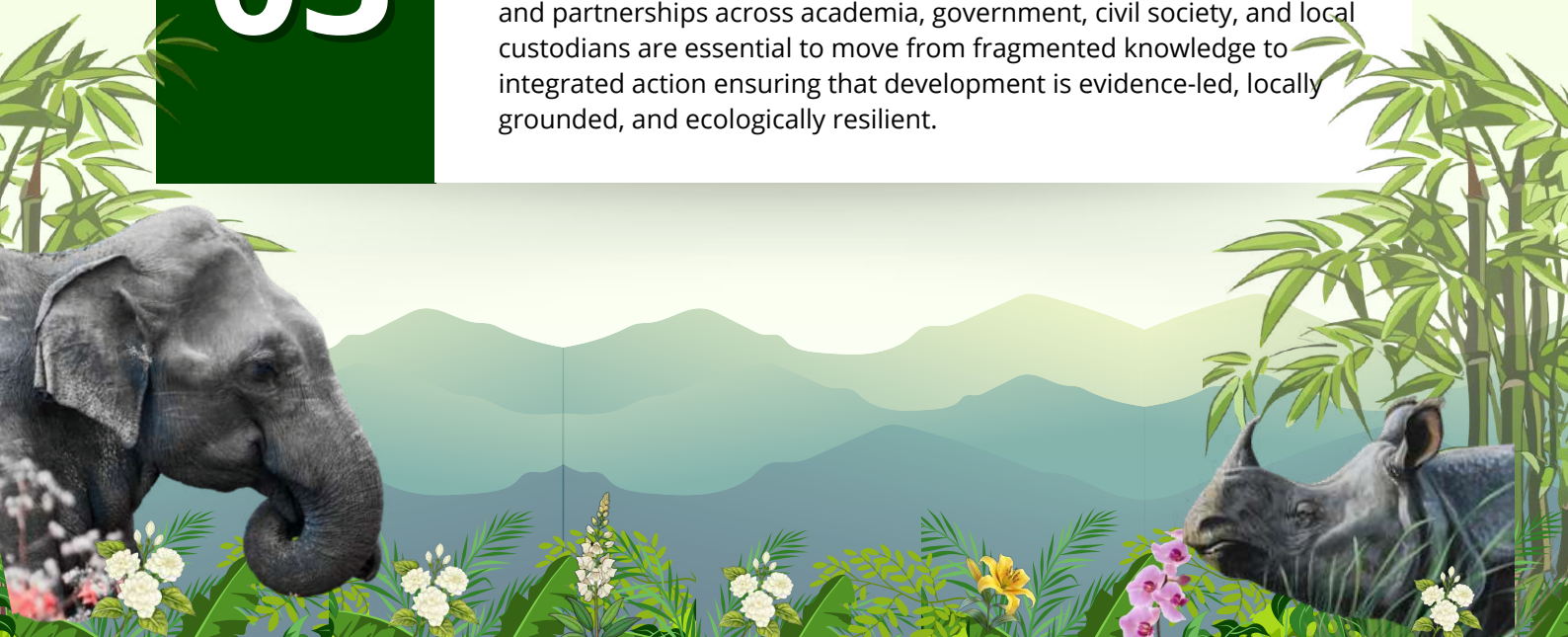
Launch of The Himalayan Magazine

The partnership also led to the launch of The Himalayan, an annual flagship publication of the Balipara Foundation. The magazine brings together articles from partner universities, organisations, experts, and scholars to reflect on the future of the Third Pole and the Himsagar (Eastern Himalaya). Each edition explores critical themes such as water security, climate resilience, sustainable livelihoods, community knowledge systems, and the integration of science and technology with conservation, serving as a knowledge bridge between academia, policy, and practice.

03

Strengthening Research and Collaboration for Ecological Development

Regenerative land stewardship in the Eastern Himalaya requires deeper collaboration between science, policy, institutions, and communities. Long-term ecological research, shared data platforms, and partnerships across academia, government, civil society, and local custodians are essential to move from fragmented knowledge to integrated action ensuring that development is evidence-led, locally grounded, and ecologically resilient.



CONCLUDING INSIGHT

The discussions revealed that the future of the Third Pole will not be determined by climate models alone but by choices in governance, knowledge integration and societal values. The Eastern Himalayas already hold many of the solutions needed to address climate and ecological challenges embedded within its forests, cultural practices, community institutions and lived experiences shaped by and with the land. The central challenge and opportunity lies in recognising these assets, strengthening them through inclusive governance and scaling them within a regenerative framework. By doing so, the region can move toward a future where ecological vitality and human prosperity are mutually exclusive.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