



REVITALIZING ANCIENT LINEAGES

A Sundarban Conservation Model

A data-driven conservation model by PFRI-SAFE is addressing the escalating threats to the **'living fossil'** horseshoe crab species, *Carcinoscorpius rotundicauda* and *Tachypleus gigas*, in the Indian Sundarban. These species, vital bio-indicators for benthic ecosystem health, face synergistic pressures from habitat degradation, bycatch mortality, poaching, and climate-induced impacts, such as those from Cyclone Amphan. The 'Data Deficient' IUCN status of *C. rotundicauda* highlights a critical need for robust ecological data. To address this, the project employs a geospatially driven research design, using GIS mapping for baseline habitat assessments on Satjelia Island. This empirical analysis identifies critical breeding grounds and zones of mangrove degradation, directly informing targeted restoration strategies.

The intervention integrates ecological engineering, specifically sediment stabilization technologies like earthen rings and bamboo bandalling, with community-managed mangrove nurseries to rehabilitate essential estuarine dynamics. A core pillar of this interdisciplinary model is the integration of local communities, particularly fishers and women's collectives, as formal conservation stakeholders. This is achieved through capacity-building frameworks that link biodiversity protection with tangible socioeconomic benefits, thereby fostering participatory governance. Simultaneously, mainstreamed environmental education for youth embeds long-term stewardship within the local socio-ecological system. This initiative exemplifies a scalable, evidence-based blueprint that aligns biodiversity persistence with climate resilience. It demonstrates the critical interplay of advanced spatial analysis, participatory governance, and ecological restoration, offering a replicable policy framework for ecosystem-based adaptation and species protection in the Sundarban delta.



NAVIGATING THE HUMAN-ELEPHANT CONFLICT IN INDIA

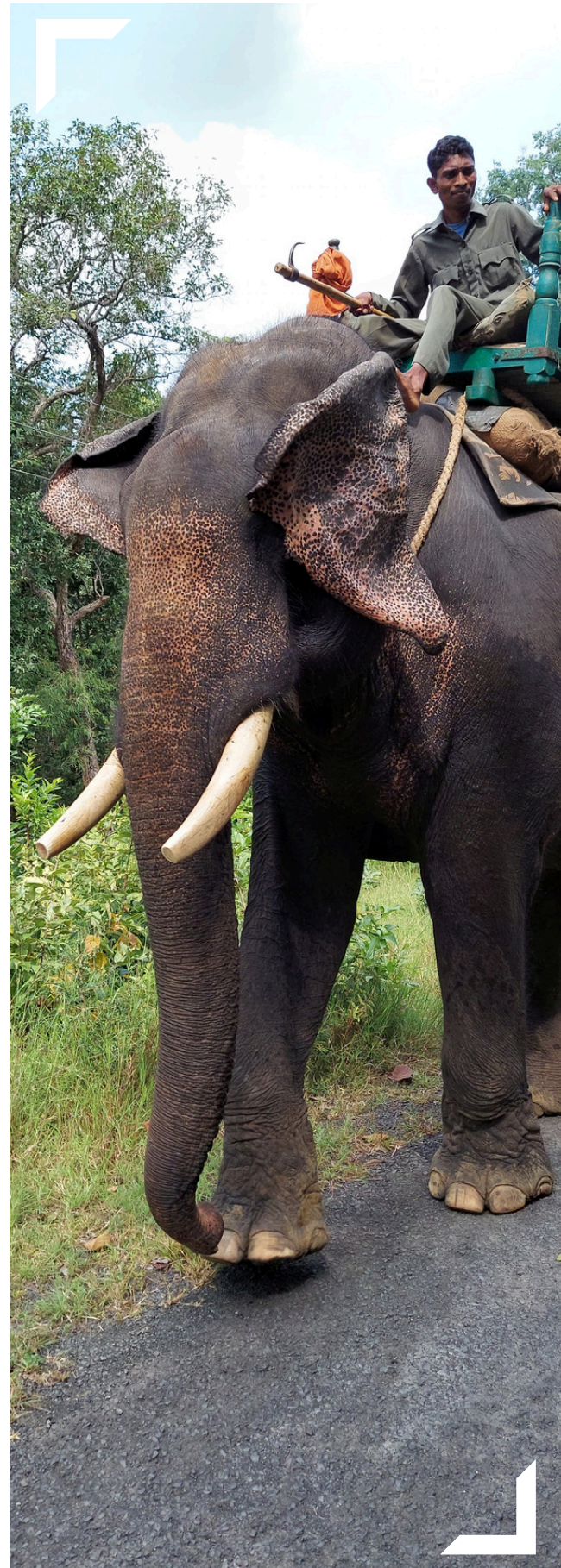
A PRESENT-DAY SCENARIO ANALYSIS

Human-elephant conflict has emerged as one of India's most pressing socio-ecological challenges, claiming 2,853 lives nationally between 2019-2023, with West Bengal recording 436 fatalities during this period. Beyond the tragic loss of human lives, communities face devastating economic impacts through crop damage, infrastructure destruction, and lost livelihoods. Women and children in these conflict zones bear a disproportionate burden, experiencing heightened vulnerability during agricultural activities and increased psychological trauma from persistent threats. The conflict also jeopardizes India's wild elephant population, which constitutes 60% of Asia's total, making urgent intervention critical for both human welfare and biodiversity conservation.

Recognizing the complexity of this challenge, PFRI undertook a comprehensive study of animal-man conflict in the bio-corridors of South Bengal (*Jhargram, Medinipur and Purulia corridor*) through an innovative collaborative approach. Working closely with the Department of Forest and local communities, our research team conducted extensive field investigations to understand the spatial and temporal patterns of conflict. The study prioritized community voices, particularly engaging women farmers and village residents who experience conflict consequences most directly. Our participatory research methodology documented habitat fragmentation patterns, seasonal elephant movement trends, and community vulnerability hotspots specific to South Bengal's unique ecological context. This ground-level engagement revealed critical insights into local coping mechanisms and traditional knowledge systems that have historically mediated human-elephant interactions.

Based on our findings and global best practices, PFRI recommends an integrated mitigation framework centered on nature-based solutions and community empowerment. Foremost among our recommendations is the restoration and protection of elephant corridors through bio-fencing using native vegetation, which provides natural barriers while strengthening ecosystem connectivity. We advocate for community-led early warning networks that leverage women's self-help groups as first responders, building on their intimate knowledge of local landscapes and elephants' movement patterns. Drawing from successful international models, we propose establishing village-level conservation committees with mandatory women's representation to ensure gender-responsive conflict management. Nature-based deterrents such as chili-based repellents and strategically placed beehive fences offer non-lethal, ecologically sound alternatives to harmful barriers like electric fencing.

PFRI's framework underscores that sustainable coexistence requires not just technological interventions but fundamental shifts toward community-centered, gender-inclusive, and ecologically grounded conservation approaches. Through continued collaboration with the Department of Forest and local communities, we remain committed to translating these recommendations into actionable strategies that protect both human welfare and elephant populations in South Bengal's vital bio-corridors.



GUWAHATI DECLARATION CHARTS NEW PATH FOR NORTHEAST INDIA'S AGROFORESTRY FUTURE

On 7 November 2025, stakeholders from across India converged in Guwahati to adopt the landmark Guwahati Declaration for agroforestry development. Organized by **ICAR-Central Agroforestry Research Institute (CAFRI)**, the consultation workshop united government departments, research institutions, farmers' organizations, and civil society to address Northeast India's pressing challenges of land degradation, jhum intensification, and declining farm productivity. The Declaration positions agroforestry (*integrated cultivation of trees, crops, and livestock*) as central to the region's sustainable development, recognizing its unique ecological and cultural diversity while emphasizing state-specific policies modeled after Assam's pioneering framework, including Tree Outside Forest Rules and Wood-Based Industry Promotion Rules.

Dr. Malancha Dey, Director (Research) at **SAFE-PFRI**, presented compelling evidence on agroforestry's dual role in restoring degraded lands and enhancing rural livelihoods. She highlighted PFRI's successful interventions in Bihar and Maharashtra, alongside Northeast-specific models: Assam's bamboo-fruit-timber integration, Nagaland's nitrogen-fixing Alder systems, Manipur's Parkia-ginger intercropping, and Mizoram's bamboo-based jhum transition strategies.

The Declaration advances critical action points: formulating independent state agroforestry policies across all north-eastern states, developing a Five-Year Regional Agroforestry Action Plan (2026–2031), implementing nursery accreditation under the RKVY-Agroforestry scheme, and establishing Agroforestry Resource Centres in each state. It calls for creating a North East Agroforestry Knowledge Network for collaborative research and technology transfer. A key strategic principle is species deregulation, removing restrictive regulations on 4-5 priority multipurpose tree species per state to encourage farmer adoption. The Declaration emphasizes market-driven programs with robust value chain linkages to bamboo, timber, spices, and medicinal plant industries, while championing women and youth-led enterprises. It advocates for financial mechanisms including institutional credit, insurance for tree-based systems, and access to carbon markets.

The Guwahati Declaration marks a pivotal shift toward integrated land-use planning that harmonizes ecological restoration with economic viability and social inclusion across Northeast India's diverse landscapes.

