

EPISTEME

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1 Tribal Farmers Conclave

The Progyan Foundation for Research and Innovation (PFRI) recently participated in the **Tribal Farmers Conclave** at the **ICAR-Central Soil Salinity Research Institute Regional Research Station in Canning**. The event brought together farmers, researchers, development practitioners, and government representatives to discuss pathways for strengthening climate-resilient agriculture and sustainable livelihoods in the coastal Sundarban.

Discussions highlighted the increasing impacts of salinity intrusion, climate variability, and extreme weather events on coastal farming systems, emphasizing the need for adaptive practices and collaborative solutions.

During the session, Dr. Malancha Dey shared innovative approaches supporting farmers' adaptation to climate challenges. She highlighted float farming, supported by the UNDP, which enables crop cultivation on floating beds during periods of flooding or waterlogging - an effective nature-based solution for vulnerable ecosystems like the Sundarban.



She also discussed the role of localized weather monitoring systems and digital advisory platforms in strengthening farmers' decision-making. A farmer advisory mobile application currently implemented in Bihar and Maharashtra integrates weather forecasts, crop advisories, and market information to support informed agricultural planning - an approach with strong potential for replication in the Sundarban.

Adding further perspective, Dr. Aritra Mukherjee, Phd shared experiences from Bihar where integrated practices such as agroforestry, natural farming, and float farming are improving resilience and farmer incomes, alongside efforts to enhance value addition and market access.

The conclave reinforced the importance of combining climate-resilient farming practices, technology, and stronger market linkages to support sustainable livelihoods in climate-vulnerable regions.

2 Protecting Biodiversity Across Fragile Landscapes

From the tidal mudflats of the Indian Sundarban to the forests and wetlands of the Darjeeling Hills and the high-altitude ecosystems of the Hindu Kush Himalayas, biodiversity is closely linked to the health of the landscapes that sustain it. Increasing habitat fragmentation, climate change, infrastructure development, and changing land-use patterns are placing growing pressure on species and communities that depend on these ecosystems.

At the Progyan Foundation for Research and Innovation (PFRI) and the South Asian

South Asian Forum for Environment (SAFE), our conservation work focuses on understanding these changes through field-based research and developing practical, locally relevant approaches for ecological restoration and community resilience.



Conserving Species by Protecting Their Habitats

The Indian Sundarban supports important coastal biodiversity, including the horseshoe crab species *Carcinoscorpius rotundicauda* and *Tachypleus gigas*. These ancient marine arthropods depend on healthy intertidal habitats for breeding and feeding. However, habitat degradation, coastal development, fishing activities, and extreme weather events are placing increasing pressure on their populations.

Our work in the Sundarban focuses on restoring degraded mangrove habitats and strengthening the ecological functions of intertidal landscapes. Healthy mangrove systems can provide important breeding, feeding, and refuge habitats while supporting sediment processes and wider estuarine productivity.

Keeping Elephant Corridors Connected

In North Bengal, human settlements, tea gardens, agricultural areas, and infrastructure increasingly intersect with traditional elephant movement routes. Habitat fragmentation has contributed to human-elephant conflict, affecting both local communities and wildlife.

PFRI and SAFE are working towards a place-based approach to corridor

conservation through migration corridor mapping, identification of conflict-prone areas, and promotion of community-led biofencing as a non-lethal deterrence measure. The approach recognises that long-term conservation must consider both ecological connectivity and the needs of communities living alongside wildlife.

Maintaining functional corridors is not only about allowing elephants to move. It is about creating landscapes where people and wildlife can coexist with reduced risk and conflict.

Small Wetlands, Critical Habitats

The Himalayan salamander (*Tylototriton himalayanus*) depends on small seasonal wetlands, locally known as pokhris, across parts of the Darjeeling Hills and adjoining Himalayan landscapes. These wetlands may be small in size, but they can play an important role in the species' breeding cycle.

Drainage, pollution, invasive species, road development, and changes in surrounding land use can reduce the ecological suitability of these breeding sites.

Many such wetlands also occur outside formally protected areas, making community-level conservation particularly important. Our work focuses on habitat characterisation, pond revival, invasive species management, and identification of potential breeding habitats. By understanding the specific ecological conditions required by the species, we aim to support the development of small, functional habitat sites that can contribute to wider landscape-level conservation.

Responding to Climate-Driven Biodiversity Loss

The impacts of climate change are particularly visible across mountain ecosystems, where changing temperatures, altered precipitation patterns, and cryospheric changes are affecting habitats, biodiversity, and traditional agricultural systems.

Across India, Nepal, and Bhutan, PFRI and SAFE are working to understand climate-driven Loss and Damage to biodiversity while also strengthening the adaptive capacity of mountain communities.

An important part of this work is the conservation of agrobiodiversity and promotion of climate-resilient agricultural practices. Supporting locally adapted landraces and climate-resilient crop

varieties, including high-altitude rice varieties such as YusirayMaap, YusirayKaap-3, and Chandanath-1 (Khangma Kambja 1), can help communities respond to changing environmental conditions while retaining valuable agricultural diversity.

From Evidence to Action

Across these landscapes, the challenges may look different: a disappearing intertidal habitat, a fragmented elephant corridor, a drying seasonal wetland, or a changing mountain agroecosystem. Yet they share a common foundation: healthy ecosystems are essential for both biodiversity and human well-being.

For PFRI and SAFE, conservation therefore goes beyond protecting individual species. It involves understanding ecological processes, restoring habitats, generating field-based evidence, and working with communities to develop solutions that can be sustained over time.

From coastal wetlands to mountain landscapes, conservation begins with understanding the ecosystem and translating that understanding into action.