



International Day for Conservation of Mangrove Ecosystem- 'World Mangrove Day'

Mangroves are among the planet's most critical ecosystems acting as natural coastal buffers, nurturing rich biodiversity, and sequestering carbon at extraordinary rates. Yet these 'forest guardians' face relentless threats from climate change, pollution, and unsustainable development. Every *July 26*, *World Mangrove Day* spotlights the vital role mangroves play in sustaining communities and combating global warming.

At **SAFE** and **PFRI**, our mission is to equip local stewards with the knowledge and tools to defend and restore these invaluable habitats. While we highlight their importance on this special day, true conservation demands daily action and unwavering commitment.

Celebrating *World Mangrove Day* isn't just a ceremony; it's a call to action that perfectly aligns with our vision of resilient wetlands and empowered communities.

'Celebrating World Mangrove Day at Maipit & Tipligheri'

On the occasion of *WorldMangroveDay*, a vibrant two day celebration was hosted by **South Asian Forum for Environment, SAFE** and **Progyan Foundation for Research and Innovation PFRI**, in collaboration with **Rotary Club Of Calcutta, Camaraderie**.

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Research Centre of PFRI,
Kishorimohanpur, Maipit,
Baikunthapur GP, Kultali Block,
West Bengal, Indian Sundarban



On 26 July 2025



CRACK Research Centre of PFRI
& SAFE, Tipligheri, Lahiripur GP,
Gosaba Block, West Bengal, Indian
Sundarban



On 27 July 2025

The Maipit event was graced by the Pradhan of Baikunthapur Gram Panchayet Smt. Jyotsna Haldar and Upo Pradhan Sri Shankar Das, and Ex Booth Sabhapoti of Kishorimohanpur Sri Surat Maldal, whose presence inspired the community to safeguard our green heritage.

From vibrant drawings and river walks to planting new hope our local children, Sabuj Pathshala students and dedicated women stewards came together to protect the lifeline of the Sundarban.

Together, we nurture mangroves. Together, we empower our future.

Mangrove Guardians with knowledge, practical skills and a shared passion for safeguarding the Sundarban

Highlight

Day 1 — PFRI Research Center, Maipit

- Drawing Competition: 'Mangrove Lifeline of the Sundarban' with 31 enthusiastic local children
- Interactive Walk & Talk along the river's mangrove banks
- Habitat Cleaning & Plantation Drive led by our dedicated women mangrove stewards
- Launch of a Digital Mangrove Book to empower young learners

Day 2 — The CRACK Centre of SAFE & PFRI, Tipligheri

- Drawing Contest: 'Mangrove & Royal Bengal Tiger' with 22 Sabuj Pathshala students
- Creek-side Awareness Walk & engaging discussions on mangrove ecosystem services
- Creek Bank Cleaning Drive & hands-on Mangrove Nursery Raising Workshop
- Unveiling of a Field-ready Mangrove Propagation Guide for practical conservation skills





Global Tiger Day

📍 *Bali Dhanamoni Model High School in Gosaba, Sundarban*

The Royal Bengal Tiger, the apex predator of the Sundarbans, is more than a majestic icon – it's a keystone species whose presence maintains the balance of this unique mangrove ecosystem. The Sundarban, the world's largest tidal mangrove forest, provides critical habitat not only for these striped guardians but also for countless other species and coastal communities. Every July 29, *Global Tiger Day* unites us worldwide to celebrate these magnificent cats and to renew our commitment to their conservation. At PFRI, empowering youth to champion environmental stewardship is at the heart of everything we do so today's roar is our roar.

Progyan Foundation for Research & Innovation (PFRI) the research wing of South Asian Forum for Environment (SAFE) in collaboration with Sundarban Tiger Reserve (STR), unleashed a wild, youth-powered *Global Tiger Day* celebration at *Bali Dhanamoni Model High School in Gosaba*, deep in the heart of the Indian Sundarban.

This wasn't just an event it was an action-packed tribute to Bengal's legendary striped guardians. Through colourful painting competitions, fierce quizzes, and passionate extempore sessions, students connected with the magic of their homeland: the mangroves, the biodiversity, and the majestic Royal Bengal Tiger protecting this fragile paradise.



Our Message Was Simple

'Protect the Royal Bengal Tiger, save the Sundarban and secure a brighter tomorrow for us all'



Children learned that Royal Bengal Tigers aren't just magnificent animals they are guardians of the mangrove forests who help keep the balance of nature, protect other animals, and support healthy forests and rivers for everyone. Protecting these mighty tigers isn't only a scientist's job it's everyone's responsibility.

Through interactive activities, they discovered:

- The Royal Bengal Tiger is a symbol of ecological balance.
- Mangroves are climate warriors, silently shielding their islands from the rising tides.
- Safeguarding nature starts at home, with each of us.

These weren't just competitions they were journeys in learning, creativity, and leadership. Each brushstroke, quiz answer, and impassioned speech was a step towards shaping tomorrow's conservationists and community champions.

At PFRI, we're not just teaching facts we're building a movement.

Because when children understand and love their Sundarban, they'll rise as its fiercest defenders for clean air, safe homes, sustainable jobs, and a thriving tomorrow. Let's roar together for the stripes, the forests, and the future!





Decarbonizing Riverine Mobility through Solar-Battery Innovation in Eco-Sensitive Zones

A solar-powered, battery-electric ferry has been introduced to provide public transport services on the **Dayapur-Pakhiralay** route within the Sundarban delta. The vessel is equipped with a photovoltaic array for solar energy harvest, which is stored in an integrated high-capacity lithium-ion (or equivalent) battery system providing all-electric propulsion.

This transition from conventional riverine diesel engines to renewable energy significantly reduces the lifecycle of greenhouse gas emissions and virtually eliminates both hydrocarbon discharges into the aquatic environment and noise pollution, thereby preserving the ecological integrity of the Sundarban UNESCO Biosphere Reserve.

Environmental Impact Mitigation

Emission Reduction: Replacement of internal combustion engines with electric propulsion significantly curtails direct carbon dioxide and greenhouse gas emissions.

Pollution Abatement:

- **Water Pollution:** Absence of fuel/oil leakage risk reduces aquatic contamination.
- **Air pollution:** Reduce the loads of PM2.5 and CO, NO_x, SO_x, VOCs etc.
- **Noise Pollution:** Electric drivetrains offer quieter operations, preserving the ambient tranquility essential to local biodiversity.

Operational Parameters

Transit Time: Each crossing between Dayapur and Pakhirla is completed in approximately 9 minutes.

Service Frequency & Capacity: On a full charge, the E-boat is capable of executing up to 7 round trips per operational cycle, with an average passenger load of 30 individuals per trip. Daily operations typically encompass 7 to 8 crossings.

Fuel Consumption: The previously deployed conventional vessel consumed an average of 4.5 litres of adulterated diesel fuel (কাটাতেল) per operational day.

Operating Expenditure: The adoption of e-mobility has resulted in a decrease in recurring monthly operational costs by ₹1,200 compared to the former diesel-based system.

Project Management and Evaluation

This low-emission inland water transport initiative is implemented by the South Asian Forum for Environment (SAFE). Concurrently, the Progyan Foundation for Research and Innovation (PFRI) is conducting a comprehensive scientific assessment, which includes:

- Quantitative analysis of carbon abatement and offset potential relative to legacy systems (carbon leverage)
- Evaluation of kinetic and operational efficiency (travel efficacy)

Multi-vector environmental impact assessment focused on emissions, aquatic ecosystem health, and noise abatement.

The project exemplifies a replicable model for decarbonization of rural water transport, offering quantifiable benefits in carbon mitigation, contributing simultaneously to climate change mitigation and local air/water quality improvement, operational efficiency, and environmental stewardship for fragile habitats like the Sundarban.

Recognition for Advancements in Climate Resilience Science in 58th Steering Committee meeting of Asia Pacific Network for Global Change Research (APN GCR), Kobe, Japan endorsed PFRI's (the research wing of SAFE) science-based Ecosystem Services Valuation and pricing intervention for building capacities in Climate Resilience.

The *Progyan Foundation for Research & Innovation* (PFRI), the dedicated research wing of the *South Asian Forum for Environment* (SAFE), has received prominent recognition from the Asia-Pacific Network for Global Change Research (APN). PFRI's climate resilience research was formally highlighted by APN and presented at its 58th Steering Committee Meeting, selected as an exemplary model of climate change adaptation within the region. Under the leadership of **Dr. Dipayan Dey**, the featured project focusing on the economic valuation of ecosystem services (ESS) as a mechanism for climate resilience garnered recommendation for its methodological rigor and impact. This flagship initiative, conducted over 2.5 years (*December 2020 – June 2023*) and implemented across transboundary sites in **India, Sri Lanka, and Bangladesh**, exemplifies a collaborative, science-driven approach to ecosystem service pricing.



The project's core objective was to facilitate the adoption of ecosystem-based adaptation (EbA) strategies by equipping key stakeholders, including community members, researchers, practitioners, and policymakers with analytical frameworks and practical tools for the robust valuation of ecosystem services. Such valuation underpins the integration of natural capital considerations into policy and planning, fostering circular conservation economies and enhancing systemic resilience to climate change impacts. The project's online course and policy outputs directly serve to institutionalize ecosystem service valuation as a mainstream tool for evidence-based environmental governance, resilient economic planning, and adaptive co-management throughout the Asia-Pacific including the critical ecosystems. This integrated approach empowers policy actors and practitioners with both scientific and practical tools to embed ecosystem-based adaptation strategies for climate resilience across the region. By building regional capacity for ES valuation and advancing the evidence base for EbA, the initiative directly supports the Asia-Pacific's transition toward resilient and sustainable socio-ecological systems. PFRI's work is now recognized as a leading reference for adaptive, ecosystem-centric climate risk management.

Key Policy Recommendations

- Institutionalizing Ecosystem Service Valuation in environmental impact assessments and policy cycles at national and sub-national levels, for instance, harmonizing ES pricing with planning commissions, ministries of environment, and forest regulatory authorities.
- Incentivizing Payment for Ecosystem Services (PES): Developing regulatory and market-based instruments to institutionalize PES, encouraging conservation-linked livelihood schemes, and resource user compensation mechanisms.
- Embedding ES Valuation in Climate Adaptation Strategies: Mandating the use of ES valuation metrics in capacity-building, climate-proofing infrastructure, disaster risk mitigation, and ecosystem restoration projects.
- Supporting Circular Conservation Economies by integrating valuation outcomes into economic incentive policies, land-use management, and community enterprise models.
- Regional Policy Harmonization: Promoting cross-border policy alignment for data sharing, capacity building, and joint conservation finance platforms.
- Enhancing Data Transparency and Accessibility by establishing open-source databases and monitoring platforms for ES values and climate adaptation outcomes.

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