REHABILITATION AND PROTECTION OF TROPICAL MANGROVE ECOSYSTEMS AS A CONTRIBUTION TO CLIMATE AND COASTAL PROTECTION, TO THE CONSERVATION OF BIODIVERSITY AS WELL AS THE NATURAL LIVELIHOODS IN INDIA AND SRI LANKA

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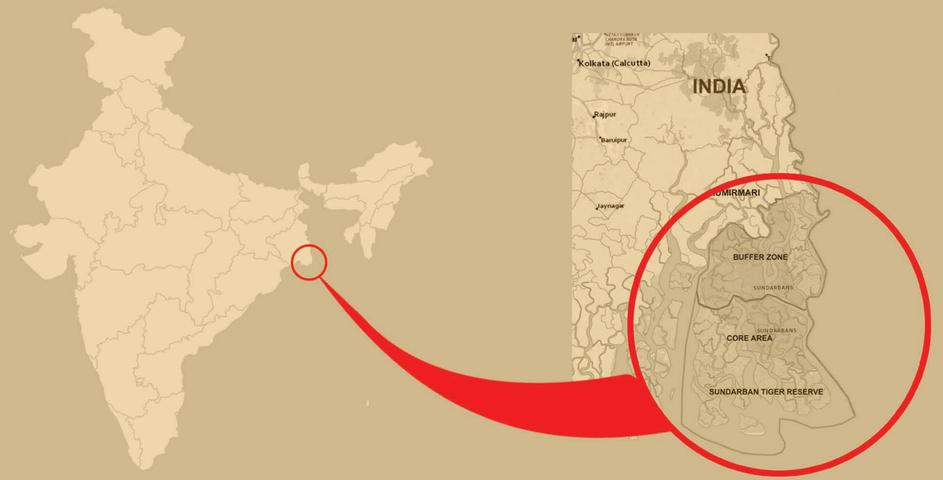

SUNDARBAN TIGER RESERVE

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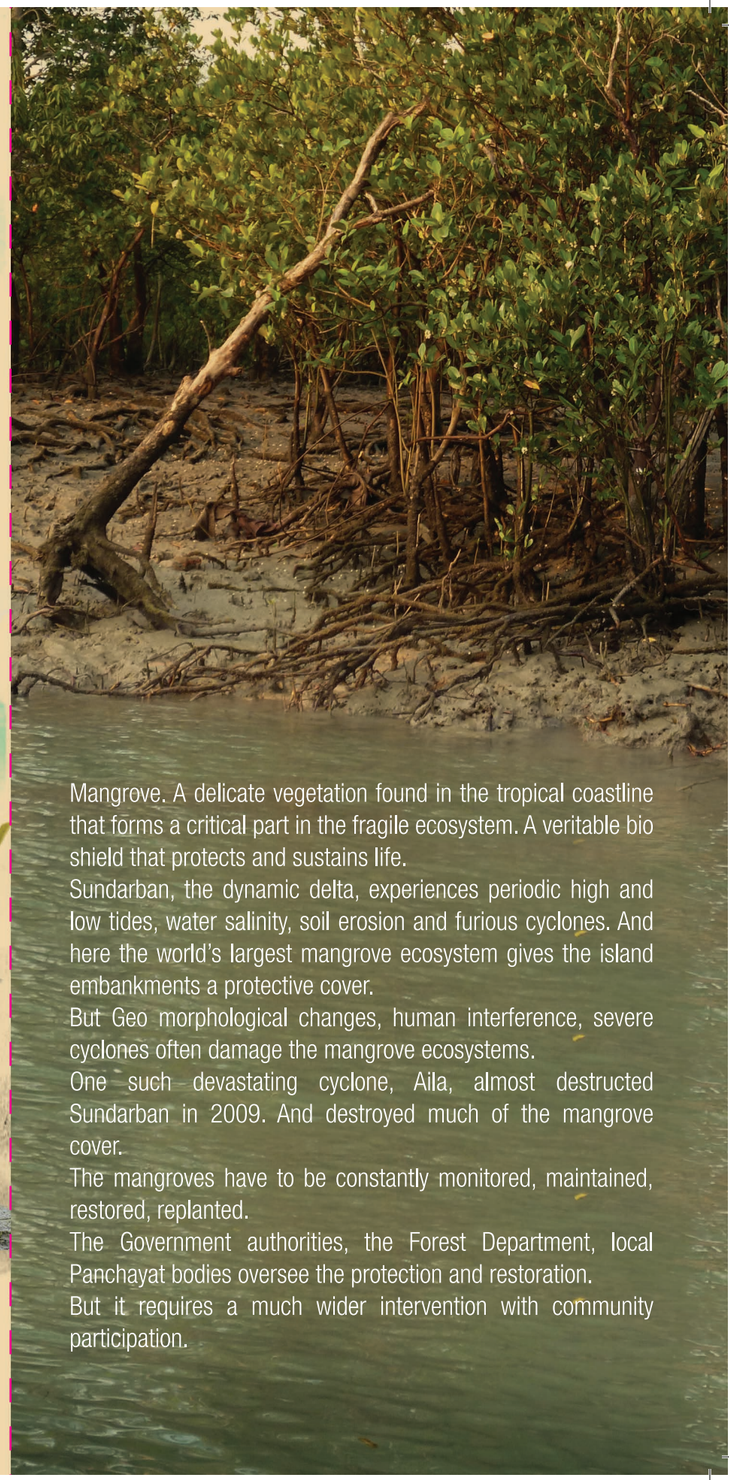
Community for Mangroves

Resilience for the Community



Mangrove. A delicate vegetation found in the tropical coastline that forms a critical part in the fragile ecosystem. A veritable bio shield that protects and sustains life.

Sundarban, the dynamic delta, experiences periodic high and low tides, water salinity, soil erosion and furious cyclones. And here the world's largest mangrove ecosystem gives the island embankments a protective cover.

But Geo morphological changes, human interference, severe cyclones often damage the mangrove ecosystems.

One such devastating cyclone, Aila, almost destructed Sundarban in 2009. And destroyed much of the mangrove cover.

The mangroves have to be constantly monitored, maintained, restored, replanted.

The Government authorities, the Forest Department, local Panchayat bodies oversee the protection and restoration.

But it requires a much wider intervention with community participation.

Global Nature Fund (GNF), Germany, in association with **Nature Environment & Wildlife Society (NEWS)**, India, launched the project on Rehabilitation and Protection of Tropical Mangrove Ecosystems in 70 hectares of land in remote Sundarban.
From the local communities, a focal group of stewards comprising mainly women was selected and suitably trained for the task of plantation, protection and monitoring of the mangrove.

The work flow included:

• Plantation Site selection

The sites were carefully selected on the basis of soil texture, salinity, slopes available, present vegetation and inundation of the mudflats.

• Species selection

The most suitable mangrove species for a particular area were selected. The selected species include *Avicennia alba, Avicennia marina, Avicennia officinalis, Bruguiera gymnorrhiza, Rhizophora mucronata, Ceriops decandra, Excoecaria agallocha, Sonneratia apetala.*

• Seed selection

Mature mangrove seeds, thrown out by the grown plants waft in the air, float in the river water. These are collected by the women stewards with fine hand nets and sent to the nurseries. This is a seasonal exercise.

• Nursery development

The nursery beds are prepared, Seeds incubated in jute & poly bags for germination. The seeds are immersed in fresh water initially and then seasoned in saline water for suitable acclimatization.

• Plantation

Plantation is taken up on the slopes of the mudflats and embankments, once the seeds germinate and are acclimatized.

Mangroves have been replanted, so far, across 70 hectares.
Once plantation has been completed, the mangrove stewards form groups and take up regular monitoring. Keeping an eye on the survival & mortality rates, growth, regeneration of other species in the inter tidal zone.

The mangrove stewards form a critical part of the entire program. On their commitment rests the success of the initiative.
So far there are 83 women mangrove stewards working tirelessly in the area.
Special initiatives have been taken up for women empowerment and the benefit of the women stewards.
Their livelihood needs have been examined and a slew of livelihood programs launched.

The initiatives include:

• Capacity building that includes training, live demonstration and hand holding- NEWS have conducted 22 training programs.

• Backyard poultry farming with Rhode Island Red (RIR) chicks, Providing the technical knowhow, quality chicken feed and poultry houses - This activity has increased annual income of the women by Rs 7400- 12900, which is a 23-25% rise on an average.

• Organic kitchen garden with organic manure, vermi compost.

• Integrated fish farming in both fresh and brackish water.

• Value chain & Market linkage -
The products find a regular market through the efforts of the locally formed Badabon Farmers' Producers' Co. Ltd and their brand Badabon Harvest that has outlets in Kolkata and elsewhere.

• 4 Bio gas plants have been installed. They provide alternative fuel from available cow dung and bio waste.

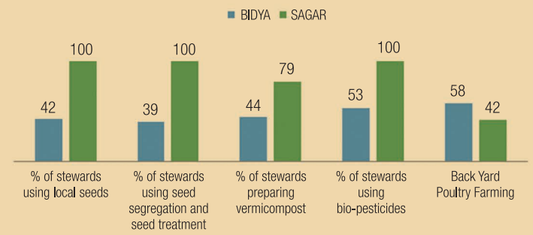
• Improved Cook Stove. Installed in some households they provide steady fuel, helping to reduce the dependence on firewood (almost 40 %) and ensuring a cleaner environment with reduced smoke emission.

• Rainwater Harvesting Unit installed in a school for ground water conservation.

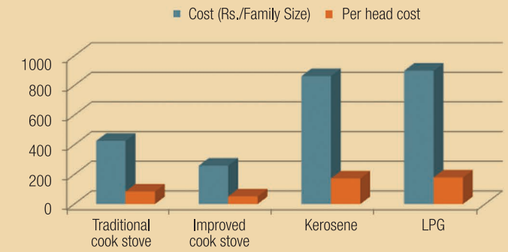
• Avenue plantation and horticulture encouraged to provide fuel fodder and fruit.

The Farmers' Field School now reaches out to the farmers in their village, next to their field, at Sumatinagar & Amlamethi. They provide training, inputs to the farmers. The interactive workshops and live demos expose the farmers to newer technologies and best practices followed elsewhere.
This is a huge initiative surrounding the mangrove, involving the communities and keeping them committed. This is working together for the cause of a healthy mangrove green cover for the protection of the home and hearth.

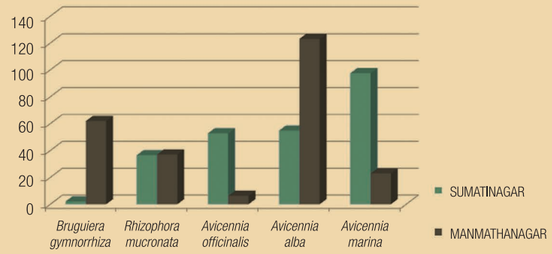
ADOPTION OF CLIMATE SMART FARMING PRACTICES BY MANGROVE STEWARDS



COMPARISON OF MONTHLY EXPENDITURE IN DIFFERENT TYPES OF COOK STOVES



SPECIES WISE SURVIVAL RATE



Mangrove Species Planted

- *Avicennia alba*
- *Avicennia marina*
- *Avicennia officinalis*
- *Bruguiera gymnorrhiza*
- *Rhizophora mucronata*
- *Ceriops decandra*
- *Excoecaria agallocha*
- *Sonneratia apetala*

Natural Regeneration of New Species in Plantation Area

- *Aegiceras corniculatum*
- *Aegialitis rotundifolia*
- *Ceriops tagal*