Rotary Salt Lake Metropolitan Kolkata
District 3291

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SHORING THE SUNDARBAN SHORES WITH MANGROVE

Under Global Grant
2454166

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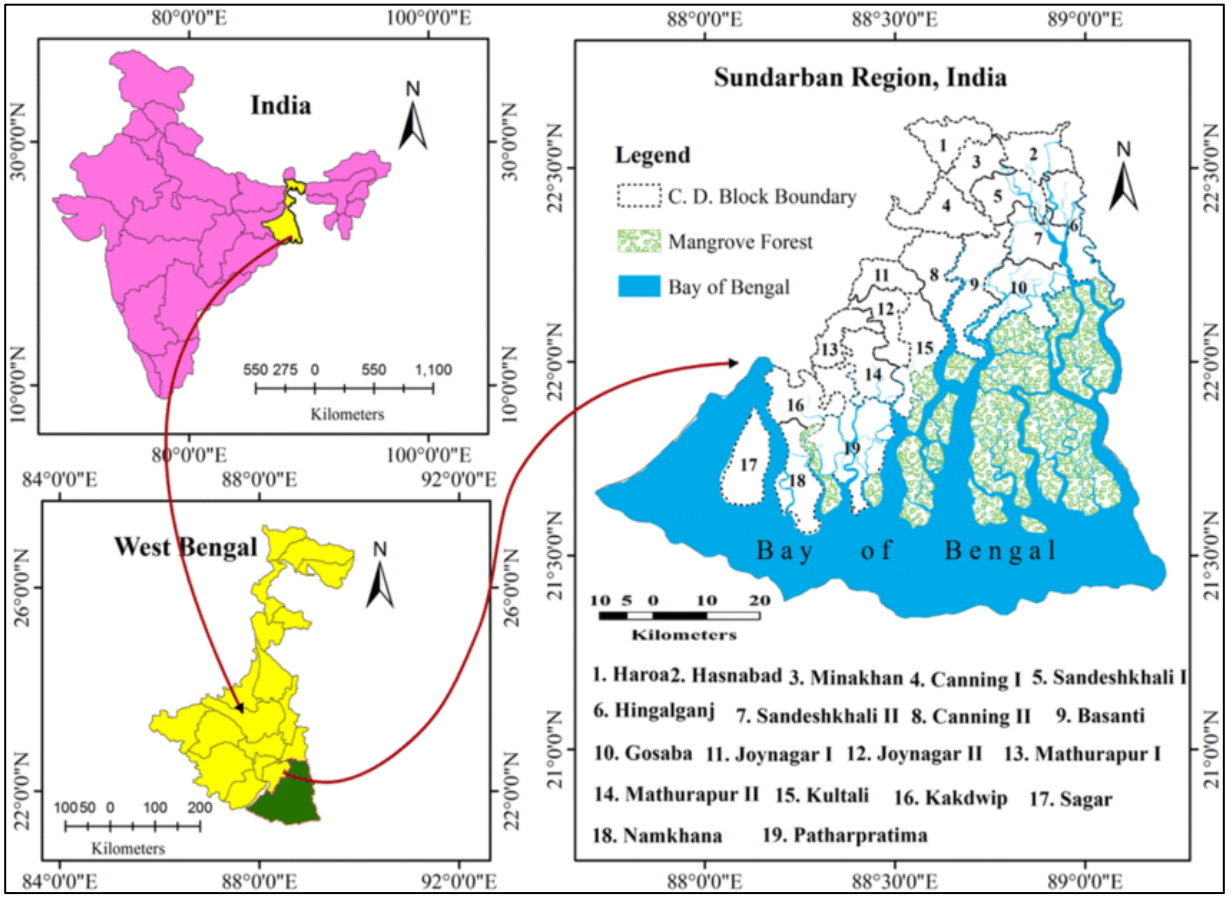
Introduction

- The **Mangrove Plantation Project**, a collaborative effort by **Young Indians (Yi)** and **Rotary Clubs**, is a proactive environmental initiative focused on restoring the vital mangrove ecosystem, particularly in vulnerable coastal regions like the **Sundarbans**. Mangroves act as natural barriers against climate change, cyclones, and erosion, while also supporting rich biodiversity. This joint initiative aims to promote sustainability, raise ecological awareness, and engage local communities in protecting and preserving these green shields for future generations.

- **Sundarban is a riverine belt of Bay of Bengal spread over 10,277 Sq. km. It is the world's largest mangrove forest.**

- West Bengal has lost 110 sq. Km of mangroves in the Sundarbans in the past two decades due to climate change and global warming.

Econonomic Times 2023, Jan



- **Every year scores of people are rendered homeless due to storms and cyclones which destroys their homes and work places.**

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- **Rotary Salt Lake Metropolitan Kolkata played a crucial role in disaster relief by providing essential support to the community during AMPHAN & YAAS.**

- Dry ration to villagers
- Aqua filters for safe drinking 10,000 litres of potable water

- **Rotary & Yi has already done** as a Pilot project – certain measures were initiated in Gadkhali village:

- Rainwater harvesting tank to solve problem of drinking water.

- Sensitising women and local people about importance of mangroves in protecting their lands and crops.

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Project So Far

- Starting livelihood – Singer Rotary Tailoring Centre to teach women tailoring.

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Project So Far

- Sanitary napkin production unit – involving local women to made sanitary napkins.
- Local nursery to produce mangrove sapling and organic vegetables.
- ECO Tourism – huts being made with Yi to promote tourism.
- Basket weaving

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Project So Far

- Mangrove plantation at bank of Ramkrishnapur –
- 50000 propules planted and
- 60% survived.

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HENCE SEEING SUCCESS OF INITIAL PILOT PROJECT WE NOW ARE PUTTING THIS APPLICATION FOR 2.5 LAKHS PLANT

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Objective

- Primary objective is to enhance the resilience of 5 villages including Ramkrishnapur village in Basanti islands of Sundarbans, District South 24 parganas against frequent flooding by establishing a wall of well planned Mangrove plantation.

- **MANGROVE PLANTATION** of diverse range of species along the vulnerable coastline of Godhkhali village considering their .....
  - Ecological adaptability
  - Growth rates
  - Benefitting in reducing wave energy
  - Prevent erosion
  - Prevent storm surge

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Community Assessment

- To identify local need
- Existing knowledge
- Livelihood options with majority of residents.
- Involving community to develop sense of ownership of the project.

DONE BY PROF. NEERA SARKAR

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Sustainability

- Development of long term management plan for mangrove plantation.
- Regular Monitoring
- Regular Maintenance
- Capacity building of the community to sustain the project beyond its initial implementation phase

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Project Implementation Steps

- Study of Topography
- Identify suitable area for plantation through site visit & ecological consideration.
- Consultation with experts like Dr Neera Sarkar report of Kalyani University
- Preparation of Soil by **SELF HELP GROUP** by laying geotextile along bank of village to prevent soil erosion & seedling cultivation.
- Plantation of Saplings after procurement according to plan by expert.
- Regular monitoring and evaluation of plants by field visit and google camera by agency & share result.

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Project Implementation Steps

- Training of local women on mangrove plantation nursery.
- Training them to learn income generating sewing, making mats, baskets out of mangrove waste for circular economy and to be marketed by Rotary Salt Lake Metropolitan & Yi.
- Training to grow marketable local organic red rice.
- Training to make eco friendly sanitary napkins for market.
- Train them in hospitality to run mangrove eco tourism and offer organic food.

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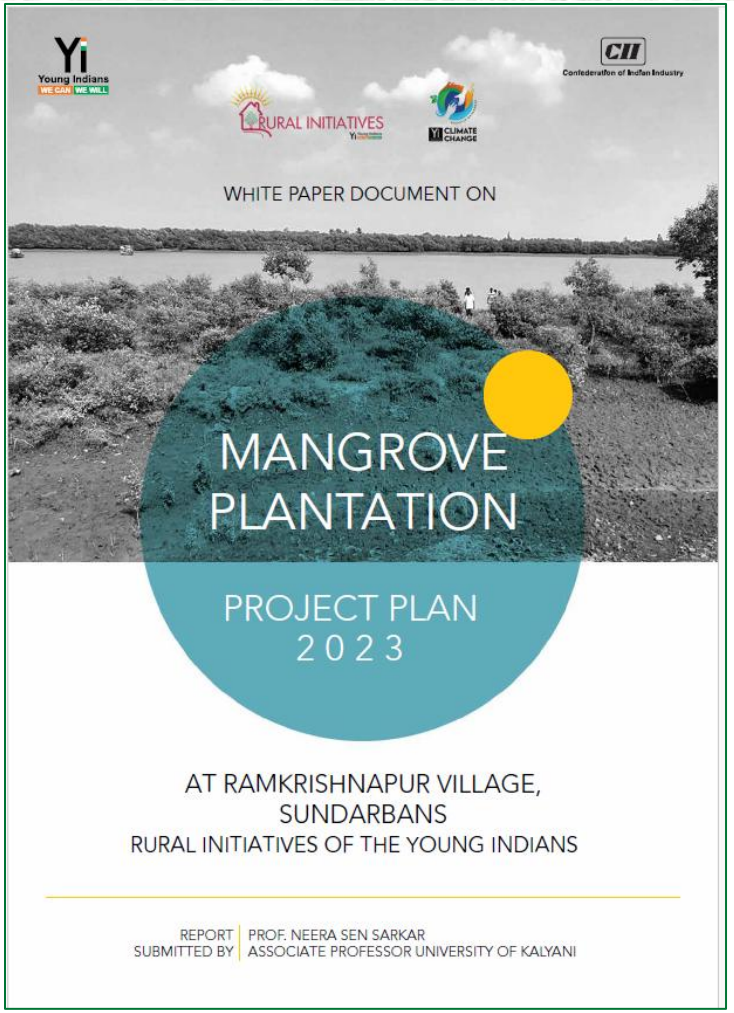
Assessment Report



Detailed project report by Specialist

Prof. Neera Sarkar

Diagrammatic View

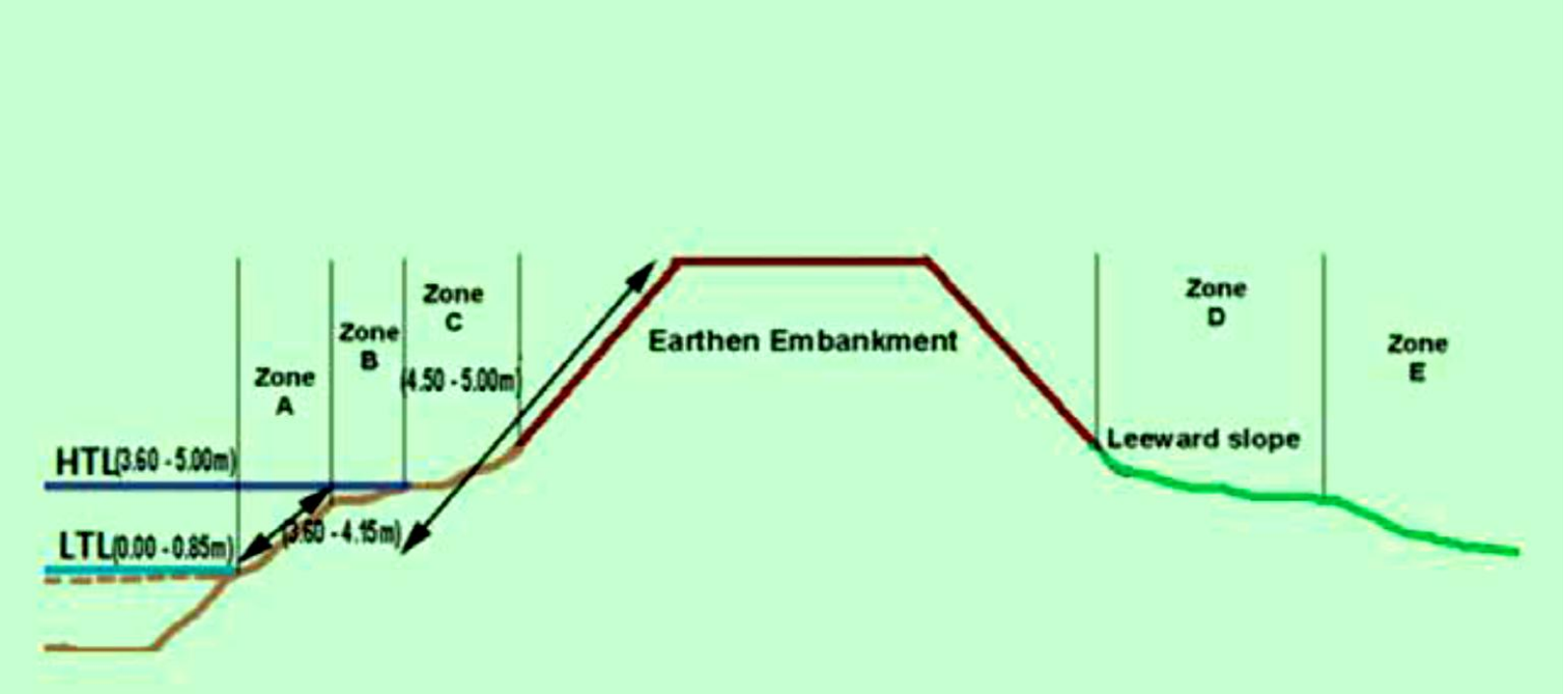


Figure - 1. Diagrammatic View of the multi-layer floral species on earthen embankments of Indian Sundarbans embankment space available for Plantation on River Side & Leeward Side Slopes Zones A, B, and C on the river front side of the embankment and D and E are on the leeward side of the embankment.

(HTL: High Tide Level; LTL: Low Tide Level)

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Ecological History of the Plantation Site

- Figure - 2. Sequential Site Maps showing selected site not being densely vegetated since 2002 & not much change in Post Aila (2009)/ Post Amphan (2021) scenario.

This can be attributed to the area being a north-east facing embankment.
So the area is deemed suitable for the purpose of mangrove plantation.

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Spatial Extent of Plantation Site

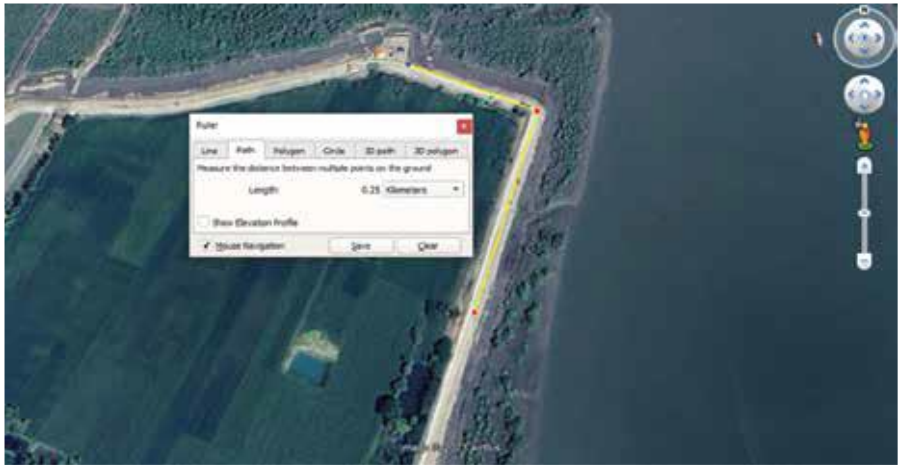

Figure-3a. Selected site transect on an embankment in Ramkrishnapur village.
Embankment space available is a right angled stretch of 0.25 Km

Figure - 3b. Selected site area on either side of embankment (river front side and leeward side) in Ramkrishnapur village. Embankment space available for Plantation is approximately 1.5 Ha.

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Aerial Views of Plantation Site

- Figure-4a. Aerial landward view of the entire plantation site transect

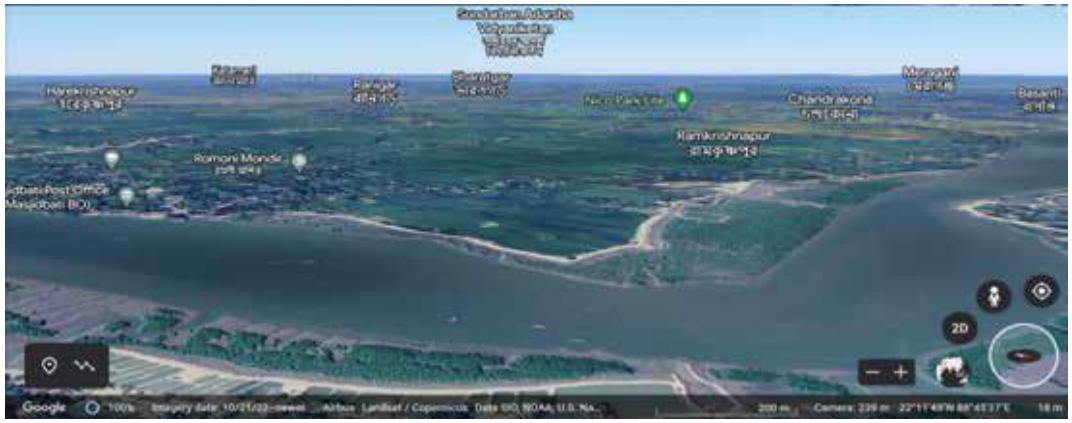

Figure-4b. Aerial river side of the entire plantation site

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Demographic Zone of 5 Villages

- Rotary jointly hands with Yi to identify villages that have been affected Gadkhali villages with 5.

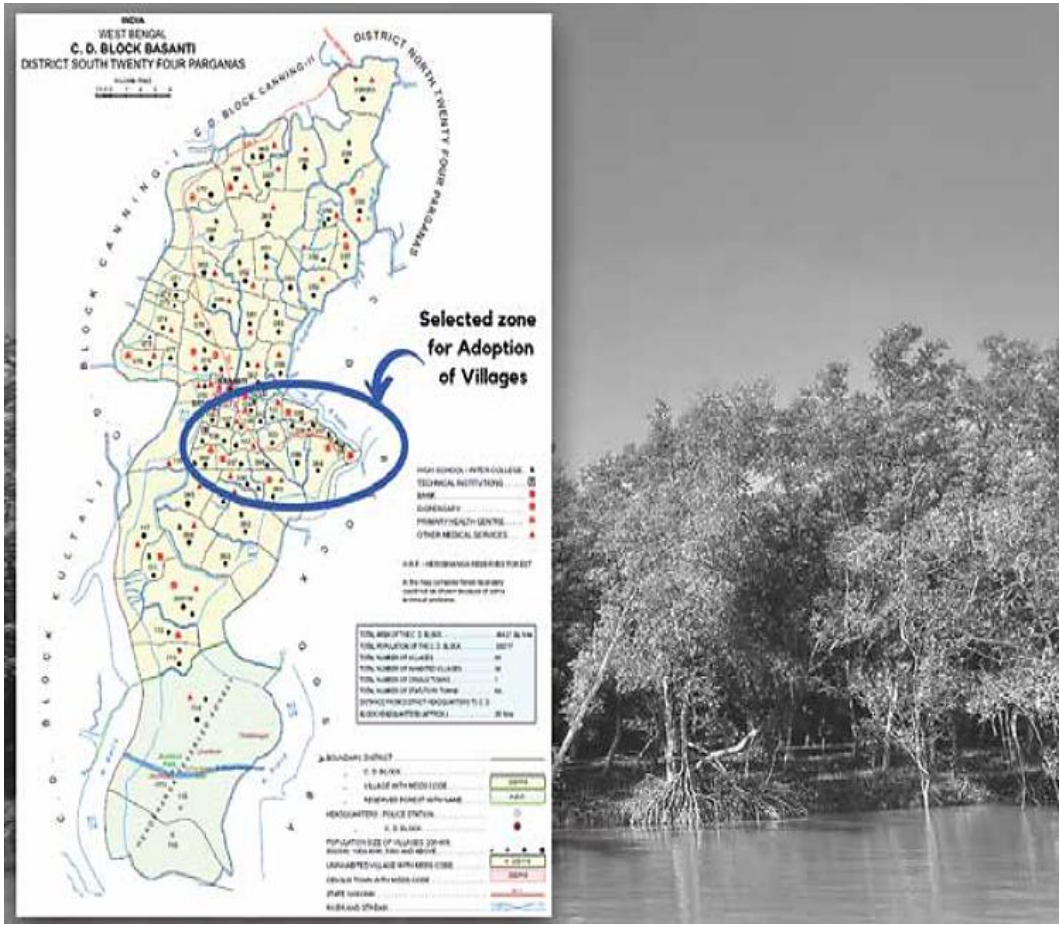
Village - 1. MOKAMBERIA (22.1651° N, 88.7470° E)

Village - 2. RAMKRISHNAPUR (22.1889° N, 88.7518° E)

Village - 3. KAMARDANGA (22.1562° N, 88.7638° E)

Village - 4. GADKHALI (22.1562° N, 88.7638° E)

Village - 5. RAMGOPALPUR (22.3716° N, 88.4126° E)



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Demographic Data of Beneficiary Villages

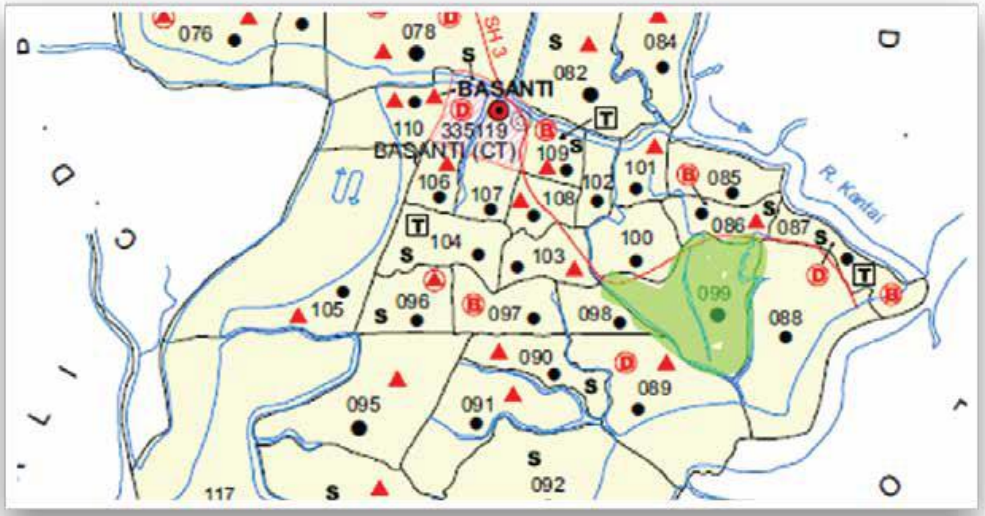

Figure - 6
Village Mokamberia (Dakshin) highlighted with green colour

Table - 1. Village - 1. MOKAMBERIA (22.1651° N, 88.7470° E)

Particulars	Total	Male	Female
Total No. of Houses	772	-	-
Population	3,446	1,762	1,684
Child (0-6)	461	215	246
Schedule Caste	2,292	1,168	1,124
Schedule Tribe	229	115	114
Literacy	74.64 %	84.16 %	64.39 %
Total Workers	1,506	1,047	459
Main Worker	881	-	-
Marginal Worker	625	244	381

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Demographic Data of Beneficiary Villages

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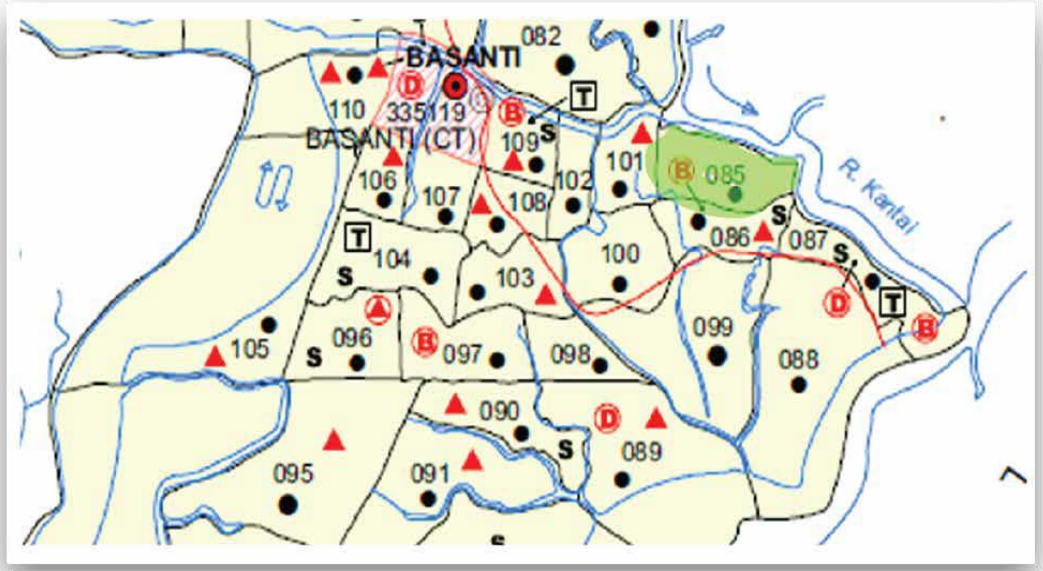

Figure - 7
Village Ramkrishnapur
highlighted with green colour

Table - 2. Village - 2. RAMKRISHNAPUR (22.1889° N, 88.7518° E)

Particulars	Total	Male	Female
Total No. of Houses	467	-	-
Population	2,176	1,108	1,068
Child (0-6)	287	149	139
Schedule Caste	1,620	832	788
Schedule Tribe	0	0	0
Literacy	77.92 %	86.34 %	69.25 %
Total Workers	672	622	50
Main Worker	496	-	-
Marginal Worker	176	156	20

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Demographic Data of Beneficiary Villages

Table - 3. Village - 3. KAMARDANGA (22.1562° N, 88.7638° E)

Particulars	Total	Male	Female
Total No. of Houses	397	-	-
Population	1,673	849	824
Child (0-6)	187	90	97
Schedule Caste	1,260	643	617
Schedule Tribe	0	0	0
Literacy	77.32 %	86.56 %	67.68 %
Total Workers	515	471	44
Main Worker	360	-	-
Marginal Worker	155	138	17

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Demographic Data of Beneficiary Villages

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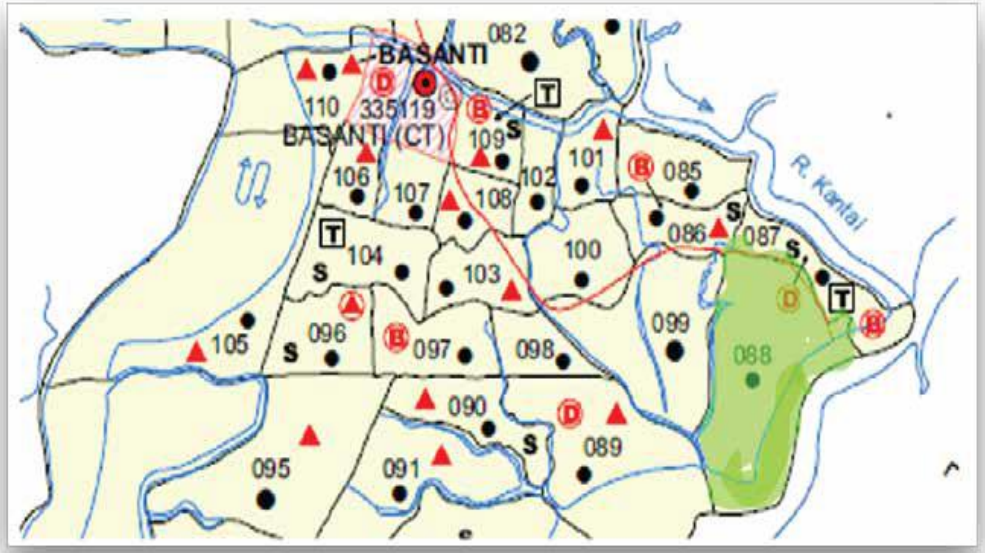

Figure - 8

Village Gadkhali highlighted with green colour

Table - 4. Village - 4. GADKHALI (22.1562° N, 88.7638° E)

Particulars	Total	Male	Female
Total No. of Houses	320	-	-
Population	1,110	605	505
Child (0-6)	116	76	112
Schedule Caste	706	355	341
Schedule Tribe	0	0	0
Literacy	63.98 %	66.01 %	61.90 %
Total Workers	406	312	94
Main Worker	302	-	-
Marginal Worker	112	67	55

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Demographic Data of Beneficiary Villages

Table - 5. Village - 5. RAMGOPALPUR (22.3716° N, 88.4126° E)

Particulars	Total	Male	Female
Total No. of Houses	318	-	-
Population	1,615	705	810
Child (0-6)	216	81	135
Schedule Caste	1,590	805	785
Schedule Tribe	0	0	0
Literacy	61.98 %	64.01 %	62.90 %
Total Workers	626	435	191
Main Worker	405	-	-
Marginal Worker	212	119	93

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Strengthen Embankment and Survival of Planted Mangroves

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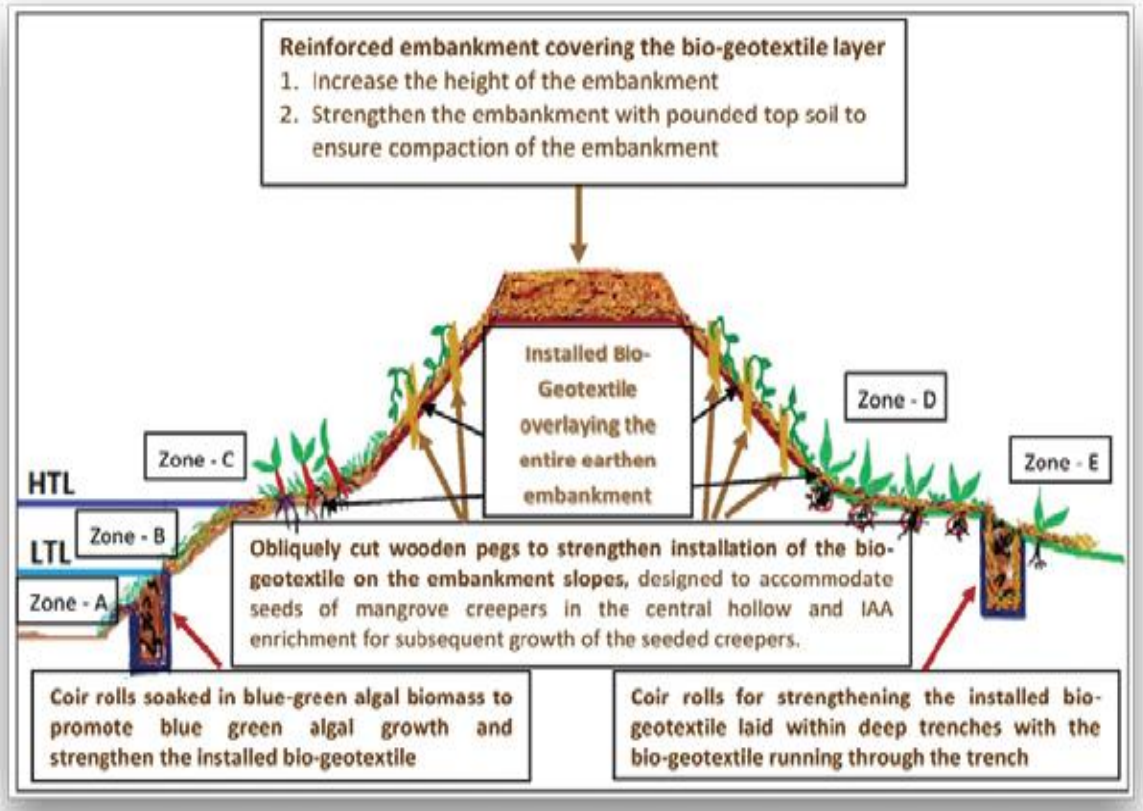

Installation of pre-seeded bio-geotextile (jute /coir / palm leaves) over earthen embankments suggested for providing enhanced stability

- The bio-geojute textile proposed has to be pre-soaked with blue-green algae with green algal filaments strewn into the fabric, and mangrove seedlings knotted with the same **(Figures – 12 and 14).**

- Raising of nursery items and production of this bio-geotextile can be introduced as an alternate livelihood option for the villagers under the scheme.

Knotting with Bio-Geotextile

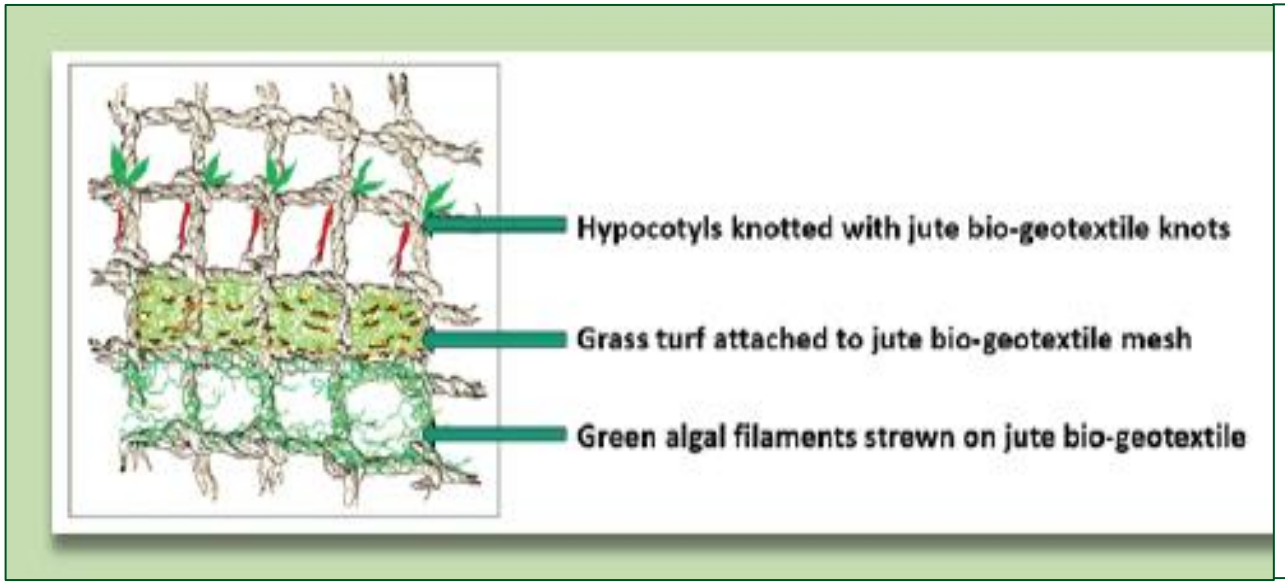

Figure – 12

Proposed methodology of vegetative matting and turfing of earthen embankments with pre-seeded bio-geotextile material

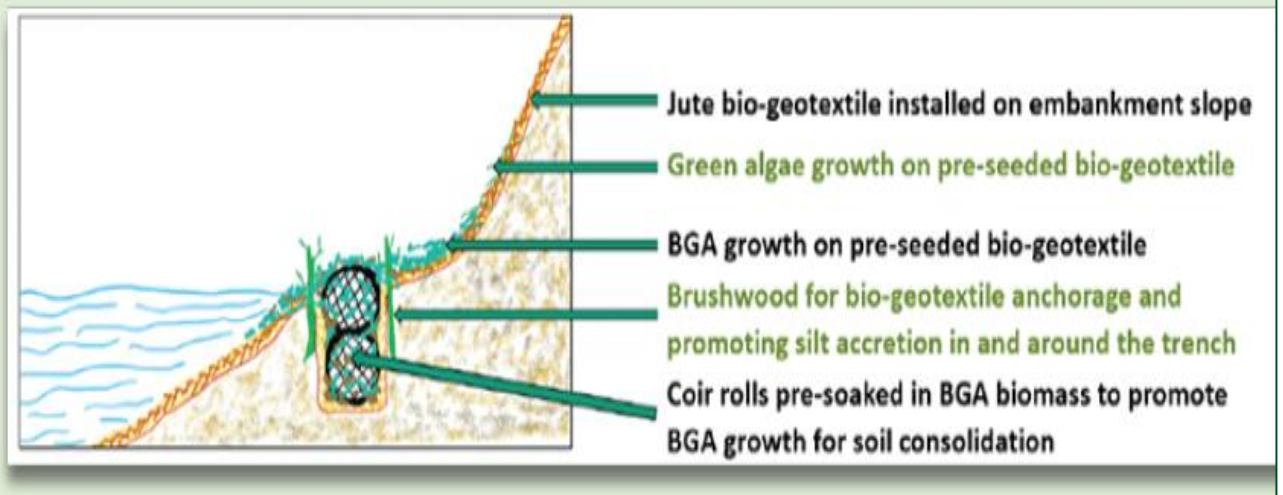

Figure - 13

Proposed methodology of digging trenches to fit in the overlaid bio-geojute textile and secure it with brush wood and coir rolls soaked in blue green algal biomass to trigger blue-green algal growth to consolidate the soil faster.

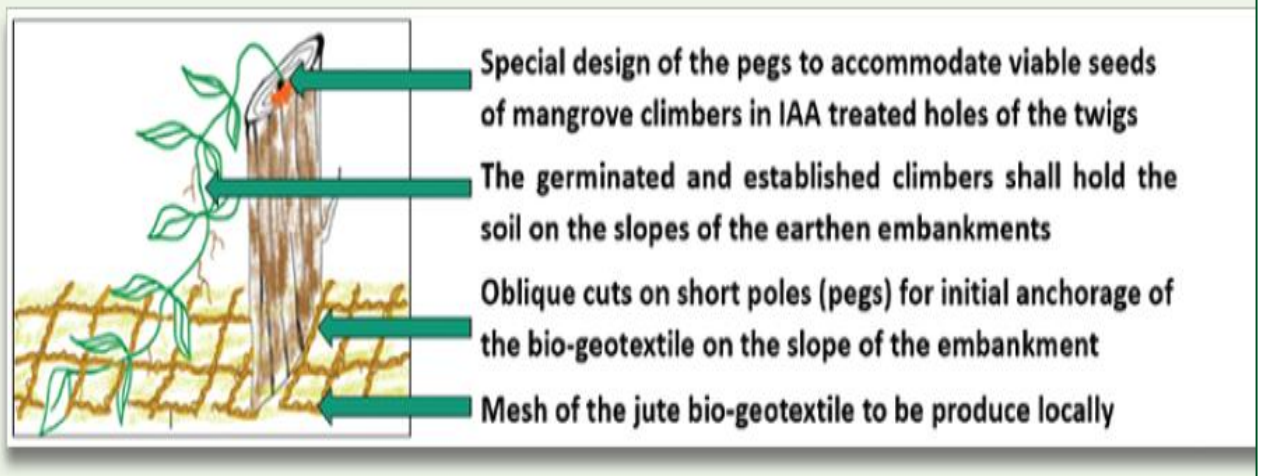

Figure - 14

Proposed methodology of reinforcement of bio-geotextiles on embankment slopes between Zone C and D with short obliquely cut branches of locally collected strong twigs, pre-seeded with climber/ twiner propagules & reinforced with IAA for growth

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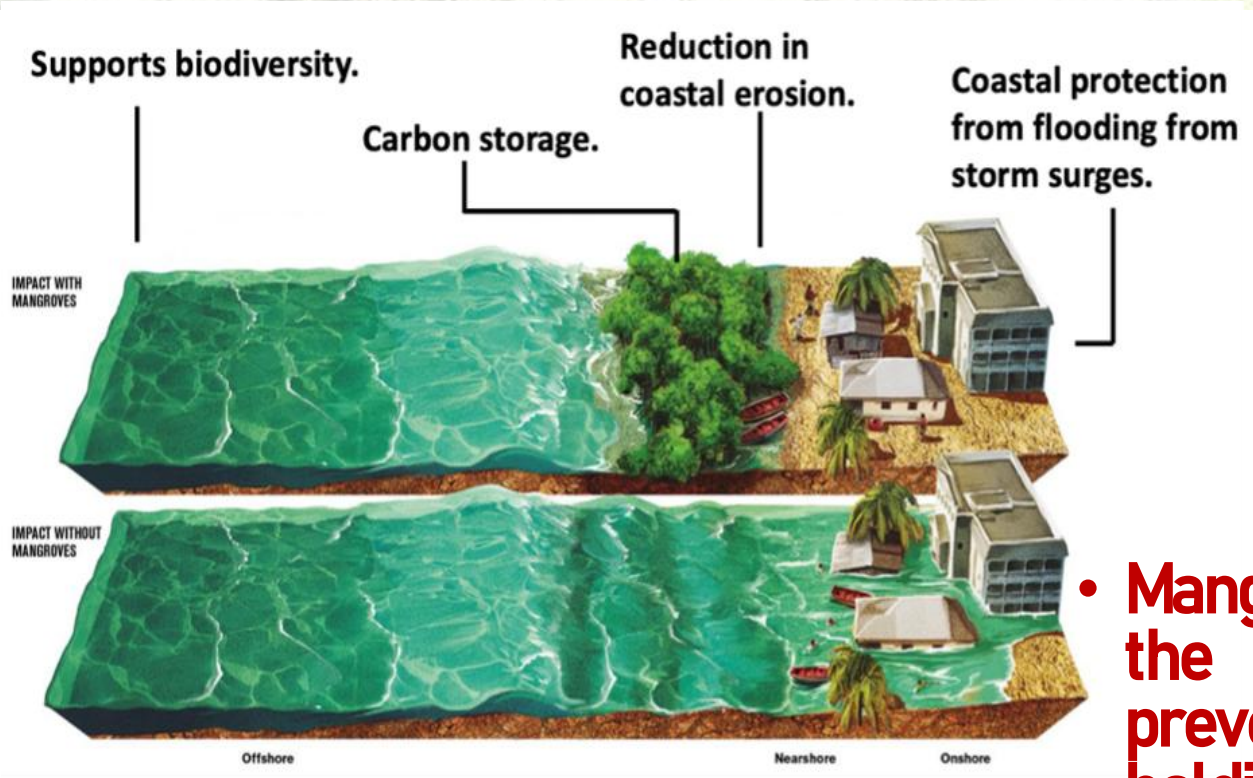
SWOC Analysis & Recommendations

Strengths	**- Multi-institutional knowledge** **- Rich mangrove diversity** **- Efficient bio-shields** **- Defined ecological succession** **- Funding opportunities**	**- Low-cost, low-maintenance** **- Local participation & livelihood** **- Use of indigenous flora only** **- Biodiversity support (birds/animals)**
Weaknesses	- Slow mangrove growth - Space limitations - Extreme weather	- River/tide effects - Socio-political conflicts - Stakeholder impatience - Grazing impacts
Opportunities	- Local livelihood & participation - "Live with Nature" approach - Embankment protection	- Navigation improvement - Mangrove nursery potential - Ecosystem research - Multi-departmental collaboration
Challenges	- Population dependence - Climate vulnerability - Social acceptance - Addressing misunderstandings	- Community capacity building - Educating policymakers - Promoting no-disturbance zones - Navigating socio-political/legal barriers
Recommendation	- Create a **Common Property Resource Model** for replication - Foster **community acceptance** - Ensure **long-term sustainability** of mangrove plantations	



- Mangrove plantations along the river border will help prevent frequent flooding by holding back the tidal waves, thereby protecting.....

2274 families.

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Budget

Sl	Description	Supplier	Cost in local currency	Cost in USD
1	Geo textile 6 ha	RCSLM	27,00,000.00	31395.35
2	Propagules of 2.5 lakh @5/-	Kishalay Foundation	12,50,000.00	14534.88
3	Plantation Labour cost for 2.5 lakh saplings @2.5/-	Kishalay Foundation	6,25,000.00	7267.44
4	Maintenance cost for 3 years	Kishalay Foundation	1,50,000.00	1744.18
5	Soil Fencing			
	Coir roll	RCSLM	8,50,000.00	9883.72
	Coir / nail / wire / rope	RCSLM	33,000.00	383.72
	Wooden Peg	RCSLM	20,00,000.00	23255.81
	IAA	RCSLM	9,000.00	104.65
6	Signage	RCSLM	34,000.00	395.35
7	Travel for collection of Propagules	Prof. Neera Sarkar	2,20,000.00	2558.14
8	DPR	Prof. Neera Sarkar	30,000.00	348.84
9	Monitoring & Evaluation and report for 3 years	Prof. Neera Sarkar	10,80,000.00	12558.14
10	Training	Prof. Neera Sarkar	5,25,000.00	6104.65
11	Survey & Report	Prof. Neera Sarkar	1,50,000.00	1744.19
12	Public awareness	RCSLM	3,00,000.00	3488.37
13	Project Management / Admin cost	RCSLM	3,00,000.00	3488.37
14	Contingency Fund		10,00,000.00	11672.9
	TOTAL		**1,12,56,000.00**	**1,30,883.70**

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Funding

	Detail	Amount USD	Support from TRF	Total
DDF International District 1		20000	16000	36000
Partner District 2		10000	8000	18000
Partner District 3		10000	8000	18000
DDF Host District Partners	3291	10000	8000	18000
Cash from International Club	Rotary 1	15000	750	15750
	Rotary 2	10000	500	10500
	Rotary 3	10000	500	10500
Cash from Host Club	Rotary Club of Salt Lake Metropolitan Kolkata	5883	294.15	6177.15
World Fund		$ 40000		
Total USD		$ 130883		
Total INR		RS. 11256000		

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Funding

TOTAL BUDGET FOR THIS PROJECT = Rs. 1,12,56,000.00

TOTAL CSR FUND REQUIRED = Rs. 50,00,000.00

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WE SEEK FOR CSR FUNDING FOR THIS INITIATIVE

THANK YOU

DR. ARUNA TANTIA

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ROTARY CLUB OF SALT LAKE METROPOLITAN KOLKATA

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