

Greening of Sundarban- Massive Mangrove Plantation



**24 Parganas (South) Division & Sundarban Tiger Reserve
Directorate of Forest, Govt. of West Bengal**

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INTRODUCTION

The Sundarban, largest delta in the world consist of 10200 sq km of Mangrove forest, spread over India (4263 sq km) and Bangladesh (5937 sq km). Each and every year several cyclonic storms hits Sundarban and its adjoining areas. Very recently super cyclonic storms- Amphan hits Sundarban and its adjoining areas and severely damaged mangrove vegetation, household, livestock, and agriculture of the entire adjoining areas of Sundarban, South 24 parganas district, West Bengal. Mangroves are the unique salt tolerant intertidal forest at the edge of land and sea. Mangroves provides coastal protection against various natural coastal disaster. It reduces the velocity of storms and act as Bio-shield or barrier to the fringe people of Sundarban. To protect our Mangroves, Human beings, Human settlement, Agricultural land etc. from the natural disasters, Hon'ble Chief Minister, Govt. of West Bengal announced planting of 5 crore Mangrove plants within this stipulated period. 24 Parganas South Division and Sundarban Tiger Reserve completed plantation of 5 crore mangrove plants over 2500 ha area of Non forest land as well as forest land and also completed 1st and 2nd infilling works under MGNREGA scheme. Protection of plantation, collecting of seed and infilling works is going on and it will be continued up to March, 2021.

During **AMPHAN**, devastating damage occurred at the adjoining areas of Sundarban Biosphere Reserve. Large no of trees uprooted, totally damaged huge no of Households, huge no of agricultural land was inundated by salt water. In this context, Directorate of forest, Govt. of West Bengal, directed to 24 Parganas South Division and Sundarban Tiger Reserve for massive mangrove plantation over 2500 ha under MGNREGA scheme.

During this pandemic situation, huge number of workers lose their works and struggling for their survival or existence. Implementation of this massive plantation giving scope of works to the rural people of Sundarban. It will also help to build up women empowerment in the rural areas of West Bengal.

2500 ha massive mangrove plantation will be providing an ample opportunity to the fringe people, Biodiversity and ecological balance will be maintained and it will be providing coastal protection as well as protection to the fringe people of Sundarban from natural disasters.

AIMS & OBJECTIVES OF THE PROJECT

Major aims & objectives of this project are summarized below:

- 1) To protect coastal regions from natural disasters
- 2) To create works for the fringe people of Sundarban during this pandemic situation
- 3) To protect fringe people of Sundarban from super cyclonic storms
- 4) To create Bio-shield or Bio-barrier
- 5) To maintain Biodiversity and Ecological balance of Sundarban
- 6) To promote mangrove based alternative livelihood
- 7) To buildup women empowerment

SCHEME OF THE PROJECT

The entire project will be completed under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Department of forest, Govt. of West Bengal, to facilitate or to initiate income generation for the rural people through planting of Mangrove species. 129 (73 schemes under 24 Parganas South division and 56 are under Sundarban Tiger reserve) numbers of schemes has already been generated under MGNREGS. Total wages have been categorized into three major categories such as; Unskilled, Semi-skilled and Skilled. The fringe people of Sundarban will be directly benefited by this scheme during this devastating pandemic situation. This scheme is divided into two categories one is wages part another one is materials part.

PROJECT AREA DETAILS

Total plantation area is 2500 ha under 10 blocks and 60 no of GP, among these blocks, no of coastal blocks are 08. Most of the plantation area falls under coastal blocks. Total 2000 ha area comes under 24 Parganas South Division comprising 1452 ha non forest area and 548 ha forest area. Total 500 ha comes under Sundarban Tiger Reserve comprising 273 ha non-forest and 227 ha forest area.

Total area Coverage by Mangrove Plantations during the year 2020-21:

Division	Area
24 Parganas (South) Division	2000 ha
Sundarban Tiger Reserve	500 ha
TOTAL AREA COVERED	2500 Ha

Block, Range and GP wise area distribution of 24 Parganas (South) Division:

List of Mangrove Plantation under 24-Parganas (South) Division during the year 2020-2021					
Executed under MGNREGA Scheme over 2000 Ha					
Sl No	Range	Work Name	Block	GP	Area (ha)
1	Matla	Creation of Mangrove Plantation	Basanti	Jyotishpur	20
2	Matla	Creation of Mangrove Plantation	Basanti	Bharatgarh	50
3	Matla	Creation of Mangrove Plantation	Basanti	Jharkhali	50
4	Matla	Creation of Mangrove Plantation	Basanti	Masjibati	35
5	Matla	Creation of Mangrove Plantation	Basanti	Masjibati	35
6	Matla	Creation of Mangrove Plantation	Canning-II	Tambuldah-I	5
7	Matla	Creation of Mangrove Plantation	Canning-I	Nikarighata	35
8	Matla	Creation of Mangrove Plantation	Canning-I	Nikarighata	35
9	Matla	Creation of Mangrove Plantation	Canning-I	Itkhola	40
10	Matla	Creation of Mangrove Plantation	Canning-I	Itkhola	40
11	Matla	Creation of Mangrove Plantation	Canning-I	Itkhola	40
12	Matla	Creation of Mangrove Plantation	Basanti	Jharkhali	30
13	Baruipur	Creation of Mangrove Plantation	Kultali	Gopalgunj	40
14	Baruipur	Creation of Mangrove Plantation	Kultali	Gopalgunj	40
15	Baruipur	Creation of Mangrove Plantation	Kultali	Gopalgunj	40
16	Baruipur	Creation of Mangrove Plantation	Kultali	Gopalgunj	40
17	Baruipur	Creation of Mangrove Plantation	Kultali	Gopalgunj	20
18	Raidighi	Creation of Mangrove Plantation	Patharpratima	Herombogopalpur	25
19	Raidighi	Creation of Mangrove Plantation	Mathurapur-II	Nagendrapur	2
20	Raidighi	Creation of Mangrove Plantation	Mathurapur-II	Kankan Dighi	18
21	Raidighi	Creation of Mangrove Plantation	Mathurapur-II	Raidighi	2
22	Raidighi	Creation of Mangrove Plantation	Mathurapur-II	Kumrapara	16
23	Raidighi	Creation of Mangrove Plantation	Mathurapur-II	Nandakumarpur	23
24	Raidighi	Creation of Mangrove Plantation	Kultali	Deulbari Debipur	40
25	Raidighi	Creation of Mangrove Plantation	Kultali	Deulbari Debipur	39
26	Raidighi	Creation of Mangrove Plantation	Kultali	Gurguria Bhubeneswari	62
27	Raidighi	Creation of Mangrove Plantation	Kultali	Gurguria Bhubeneswari	62
28	Raidighi	Creation of Mangrove Plantation	Kultali	Gurguria Bhubeneswari	61
29	Raidighi	Creation of Mangrove Plantation	Kultali	Maipith Baikunthapur	40
30	Raidighi	Creation of Mangrove Plantation	Kultali	Maipith Baikunthapur	20
31	Raidighi	Creation of Mangrove Plantation	Mathurapur-II	Nagendrapur	6
32	Raidighi	Creation of Mangrove Plantation	Patharpratima	Herombogopalpur	60
33	Ramganga	Creation of Mangrove Plantation	Patharpratima	Banashyamnagar	15
34	Ramganga	Creation of Mangrove Plantation	Patharpratima	Dakshin Raipur	32
35	Ramganga	Creation of Mangrove Plantation	Patharpratima	Dakshin Raipur	32
36	Ramganga	Creation of Mangrove Plantation	Patharpratima	Digambarpur	27
37	Ramganga	Creation of Mangrove Plantation	Patharpratima	Achintanagar	25
38	Ramganga	Creation of Mangrove Plantation	Patharpratima	Sridharnagar	50
39	Ramganga	Creation of Mangrove Plantation	Patharpratima	Sridharnagar	50
40	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Brajaballavpur	15
41	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Patharpratima	25
42	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Patharpratima	9
43	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Patharpratima	13
44	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	G-Plot	17
45	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Ramganga	30
46	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Laxmijanardanpur	15
47	Bhagabatpur	Creation of Mangrove Plantation	Patharpratima	Sridharnagar	49
48	Bakkhali	Creation of Mangrove Plantation	Namkhana	Narayanpur	12
49	Bakkhali	Creation of Mangrove Plantation	Namkhana	Namkhana	13
50	Bakkhali	Creation of Mangrove Plantation	Namkhana	Shibrampur	17
51	Bakkhali	Creation of Mangrove Plantation	Namkhana	Mousuni	22
52	Bakkhali	Creation of Mangrove Plantation	Namkhana	Haripur	32
53	Namkhana	Creation of Mangrove Plantation	Namkhana	Budakhali	8
54	Namkhana	Creation of Mangrove Plantation	Kakdwip	Pratapadityanagar	2
55	Namkhana	Creation of Mangrove Plantation	Kakdwip	Ramgopalpur	2
56	Namkhana	Creation of Mangrove Plantation	Kakdwip	Rabindra	20

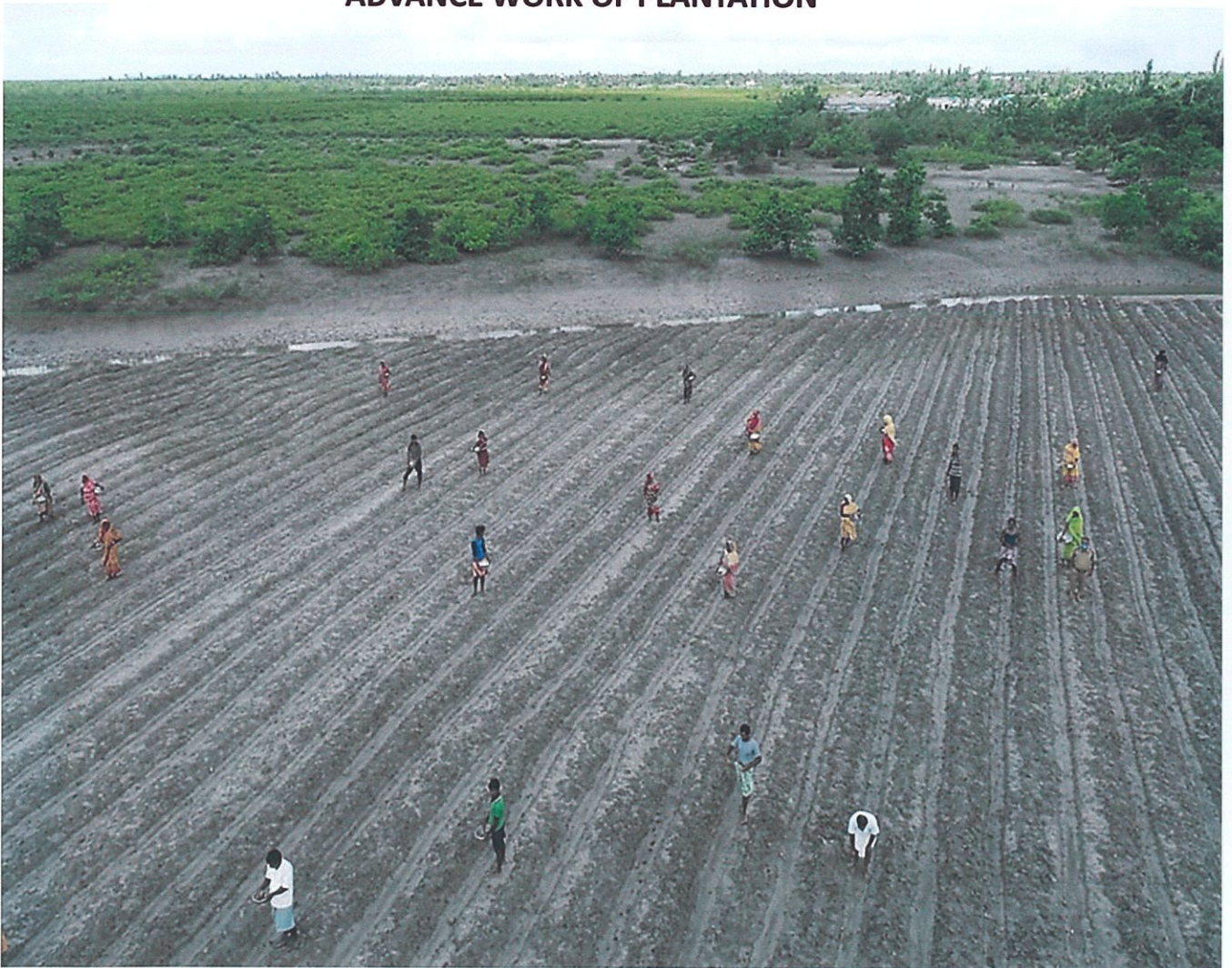
57	Namkhana	Creation of Mangrove Plantation	Kakdwip	Bapuji	5
58	Namkhana	Creation of Mangrove Plantation	Kakdwip	Swami Bibekananda	7
59	Namkhana	Creation of Mangrove Plantation	Kakdwip	Ramkrishna	3
60	Namkhana	Creation of Mangrove Plantation	Kakdwip	Madhusudanpur	15
61	Namkhana	Creation of Mangrove Plantation	Kakdwip	Surjanagar	17
62	Namkhana	Creation of Mangrove Plantation	Sagar	Gansagar	5
63	Namkhana	Creation of Mangrove Plantation	Sagar	Ramkarchar	40
64	Namkhana	Creation of Mangrove Plantation	Sagar	Daspara Sumotinagar-II	30
65	Namkhana	Creation of Mangrove Plantation	Sagar	Muriganga-I	60
66	Namkhana	Creation of Mangrove Plantation	Kakdwip	Swami Vivekananda	20
67	Namkhana	Creation of Mangrove Plantation	Namkhana	Narayanpur	60
68	Namkhana	Creation of Mangrove Plantation	Kakdwip	Madhusudanpur	30
69	Namkhana	Creation of Mangrove Plantation	Sagar	Gansagar	10
70	Namkhana	Creation of Mangrove Plantation	Patharpratima	Durbachati	20
71	Namkhana	Creation of Mangrove Plantation	Sagar	Ramkarchar	20
72	Namkhana	Creation of Mangrove Plantation	Namkhana	Budakhali	10
73	Namkhana	Creation of Mangrove Plantation	Namkhana	Narayanpur	45
Total area in Ha					2000

Block, Range and GP wise area distribution of Sundarban Tiger Reserve:

List of Mangrove Plantation under Sundarban Tiger Reserve during the year 2020-2021					
Executed under MGNREGA Scheme over 500 Ha					
Sl No	Range	Work Name	Block	GP	Area (ha)
1.	NP(W)	Creation of Mangrove Plantation	Gosaba	Bali-I	25
2.	NP(E)	Creation of Mangrove Plantation	Gosaba	Bali-I	15
3.	SWLS	Creation of Mangrove Plantation	Gosaba	Bali-I	11
4.	SWLS	Creation of Mangrove Plantation	Gosaba	Bali-I	16
5.	NP(W)	Creation of Mangrove Plantation	Gosaba	Bali-II	10
6.	NP(W)	Creation of Mangrove Plantation	Gosaba	Bali-II	30
7.	NP(W)	Creation of Mangrove Plantation	Gosaba	Bali-II	40
8.	NP(E)	Creation of Mangrove Plantation	Gosaba	Bali-II	10
9.	NP(E)	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	15
10.	NP(E)	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	10
11.	NP(E)	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	10
12.	BHT	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	4
13.	BHT	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	5
14.	BHT	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	4
15.	BHT	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	8
16.	BHT	Creation of Mangrove Plantation	Gosaba	Chotomollakhali	6
17.	BHT	Creation of Mangrove Plantation	Gosaba	Amtali	15
18.	BHT	Creation of Mangrove Plantation	Gosaba	Amtali	12
19.	BHT	Creation of Mangrove Plantation	Gosaba	Amtali	8
20.	BHT	Creation of Mangrove Plantation	Gosaba	Amtali	5
21.	SWLS	Creation of Mangrove Plantation	Gosaba	Gosaba	3
22.	SWLS	Creation of Mangrove Plantation	Gosaba	Gosaba	7
23.	SWLS	Creation of Mangrove Plantation	Gosaba	Gosaba	4
24.	NP(E)	Creation of Mangrove Plantation	Gosaba	Gosaba	10
25.	SWLS	Creation of Mangrove Plantation	Gosaba	Gosaba	3.5
26.	NP(E)	Creation of Mangrove Plantation	Gosaba	Kumirmari	10
27.	BHT	Creation of Mangrove Plantation	Gosaba	Kumirmari	20
28.	BHT	Creation of Mangrove Plantation	Gosaba	Kumirmari	5
29.	BHT	Creation of Mangrove Plantation	Gosaba	Kumirmari	5
30.	BHT	Creation of Mangrove Plantation	Gosaba	Kumirmari	5
31.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahripur	7
32.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahripur	1.5



ADVANCE WORK OF PLANTATION



33.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	10
34.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	10.5
35.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	4
36.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	2.5
37.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	5
38.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	9.5
39.	SWLS	Creation of Mangrove Plantation	Gosaba	Lahiripur	9
40.	NP(E)	Creation of Mangrove Plantation	Gosaba	Bipradaspur	6
41.	NP(E)	Creation of Mangrove Plantation	Gosaba	Bipradaspur	4
42.	NP(E)	Creation of Mangrove Plantation	Gosaba	Bipradaspur	6
43.	NP(E)	Creation of Mangrove Plantation	Gosaba	Bipradaspur	14
44.	NP(E)	Creation of Mangrove Plantation	Gosaba	Pathankhali	5
45.	SWLS	Creation of Mangrove Plantation	Gosaba	Satjelia	11
46.	SWLS	Creation of Mangrove Plantation	Gosaba	Satjelia	2
47.	SWLS	Creation of Mangrove Plantation	Gosaba	Satjelia	8.5
48.	SWLS	Creation of Mangrove Plantation	Gosaba	Rangabelia	6
49.	SWLS	Creation of Mangrove Plantation	Gosaba	Rangabelia	6
50.	SWLS	Creation of Mangrove Plantation	Gosaba	Rangabelia	8
51.	SWLS	Creation of Mangrove Plantation	Gosaba	Rangabelia	4
52.	SWLS	Creation of Mangrove Plantation	Gosaba	Rangabelia	8.5
53.	SWLS	Creation of Mangrove Plantation	Gosaba	Rangabelia	5.5
54.	NP(E)	Creation of Mangrove Plantation	Gosaba	Sambhunagar	5
55.	NP(E)	Creation of Mangrove Plantation	Gosaba	Sambhunagar	5
56.	NP(E)	Creation of Mangrove Plantation	Gosaba	Sambhunagar	5
Total					500

ADVANCE WORK OF PLANTATION

Before planting of mangrove species, so many advance works have been done such as; Site selection, Collection of job card details, Preparation of planting site, Species selection and Collection of seed/seedlings.

Site selection: Plantation site has been selected through joint survey with the district administration for suitable non forest land. Forest areas has been selected by the field staff. 2500 ha has been selected, surveyed and demarcated by GPS for massive mangrove plantation.

Collection of job card details: MGNREGS is a direct benefit scheme. Job card is mandatory for implementing this scheme. Job card details have been collected from the 60 no of GP of 10 blocks under South 24 Pargana District.

Preparation of planting site: Plantation mother bed has been prepared mainly in case of hard soil. In hard soil, trench cutting has been done before starting of plantation specially for planting of *Bruguiera* sp (Kankra).

Species selection: Species selection has been done on the basis of soil types. *Avicennia* sp (Kalo Bain, Sada Bain, Piyara Bain) has been selected for sandy clay loamy soil. For hard soil. *Bruguiera* sp has been selected. *Rhizophora* sp and *Sonneratia* sp has been selected for transition zone.



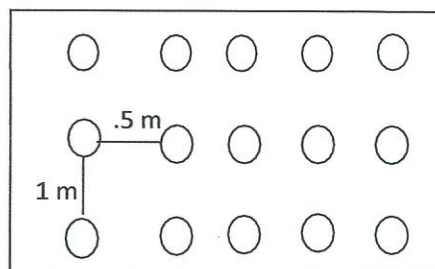
Collection of Propagules

Collection of seed/seedlings: Seed has been collected from the reserve forest area of Sundarban as well as from the various fringe areas of Sundarban. We started seed collection from 2nd week of July. Firstly, Sada Bain and Khalsi seed has been collected. After that, Kankra, Kalo Bain has collected. The seeds of Ora will be collected during the month of December.

Planting Pattern:

The following planting pattern has been followed for massive mangrove plantation:

1. Per hectare, 20000 propagules have been planted
2. 1m. x 0.5 m. spacing have been followed
3. Followed Staggered and non-staggered methods



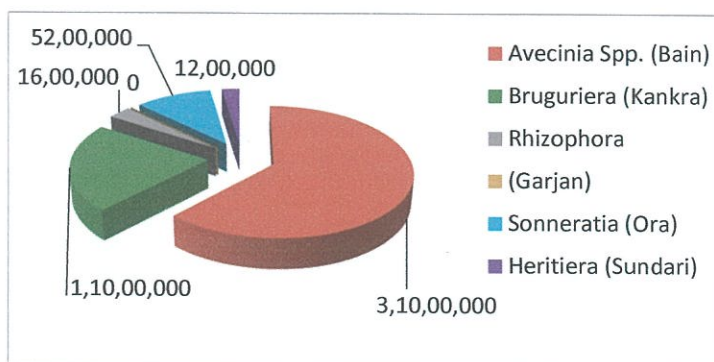
PLANTING METHODOLOGY

We are following 1m. x 0.5 m. spacing. Trench/pit cutting was done for planting of saplings, seed sowing, necked seedling dibbling has also been done. 1st & 2nd infilling has also been completed; 3rd infilling will be started.

No of seedling Mangrove Plantations during the year 2020-21

Division	Area	Seedlings / Ha	Total number of seedlings are planted
24 Parganas (South) Division	2000 ha	20,000	4,00,00,000
Sundarban Tiger Reserve	500 ha	20,000	1,00,00,000
TOTAL SEEDLINGS	2500 Ha	-	5,00,00,000

Species	Quantity
<i>Avecennia</i> sp. (Bain)	3,10,00,000
<i>Bruguiera</i> (Kankra)	1,10,00,000
<i>Rhizophora</i> sp. (Garjan)	16,00,000
<i>Sonneratia</i> (Ora)	52,00,000
<i>Heritiera</i> (Sundari)	12,00,000
TOTAL	5,00,00,000

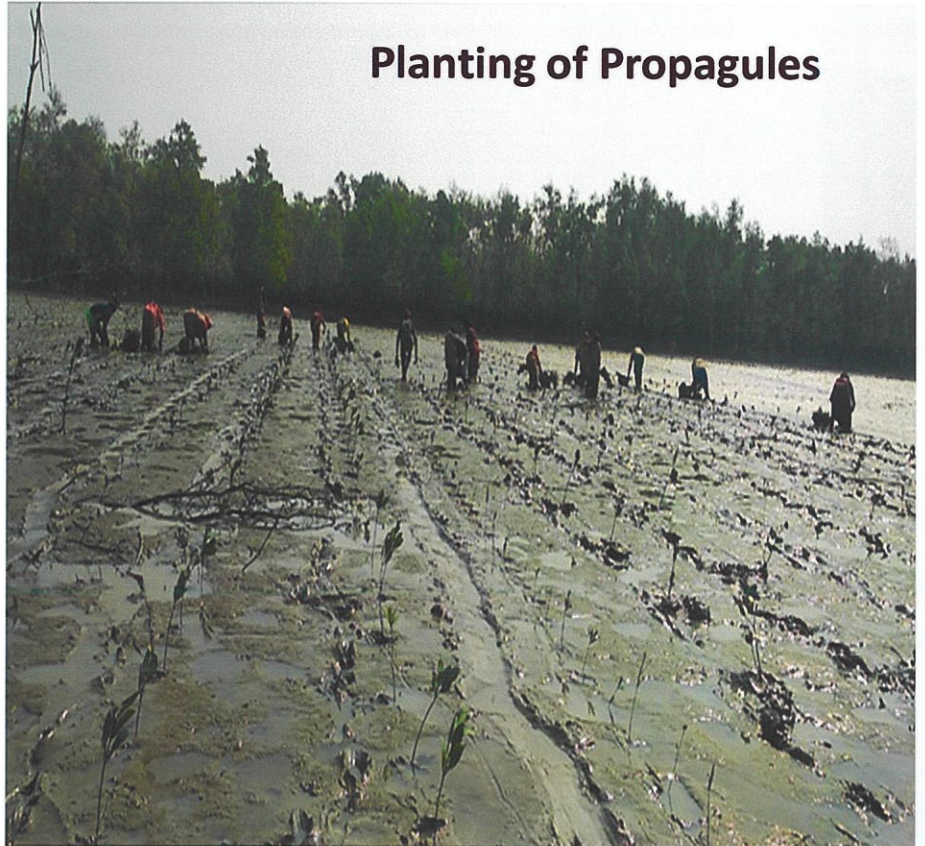


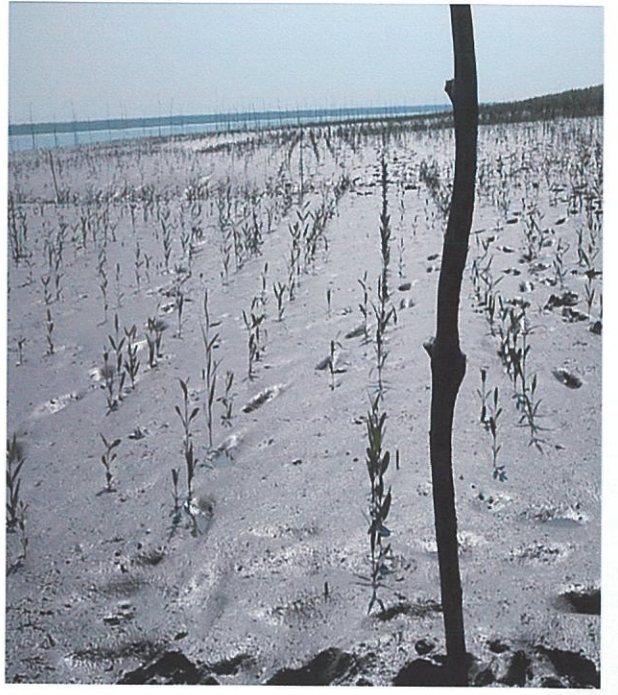


ASUS

Aug 23, 2020

Planting of Propagules





Germinating Propagules



MONITORING

Monitoring of plantation works is going on by several nodal agency. Monitoring will also be done by the Monitoring Division, Department of Forest Govt. of West Bengal. Several plantation site has already been visited and inspected by the respected PCCF & CWLW Govt. of West Bengal, Director Sundarban Biosphere Reserve and Joint Director of Sundarban Biosphere Reserve. Monitoring has also done by the District Nodal Officer, MGNREGS cell, 24 Parganas South District.

PROTECTION MEASURES

For the proper protection, several measures have been taken which are summarized below:

- 1) The erection of nylon net fencing with bamboo projection has already been done
- 2) Intensive boat patrolling is going on in the most vulnerable planting areas.
- 3) Several awareness campaigning with the help of JFMCs has been done.
- 4) A lot of awareness generating signboard has been put up in the planting areas.

WAGE GENERATION

During this pandemic situation, 24 Parganas South division and Sundarban Tiger reserve with the help of district administration targeted **2500 ha** mangrove plantation. As on today, **3,20,000** mandays have been generated and **Rs. 6,52,80,000/-** have been credited to the forest fringe people during this pandemic situation as wages.

DOCUMENTATION

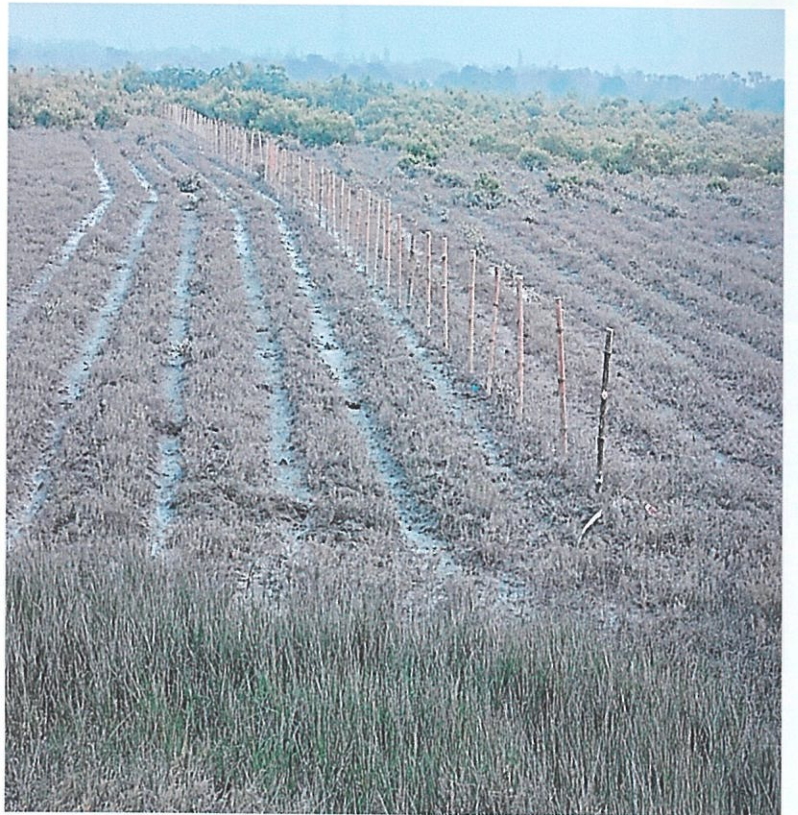
Entire plantation work has been properly documented. Step by step works i.e advance work, collection propagules, planting of propagules, protection of plantation site by the Division as well as by MGNREGS cell South 24 Parganas District.

Entire plantation work including site selection, Advance work has been documented by the following way:

1. Geo tagging of all plantation site
2. Photography by steel and drone camera
3. Videography
4. Plantation Journal
5. Media coverage



Protection Measures





Mangrove plantation over 40 Ha. at
Itkhola non forest area.

PLANTATION JOURNAL



24 - PARGANAS (SOUTH) DIVISION

Range MATLA

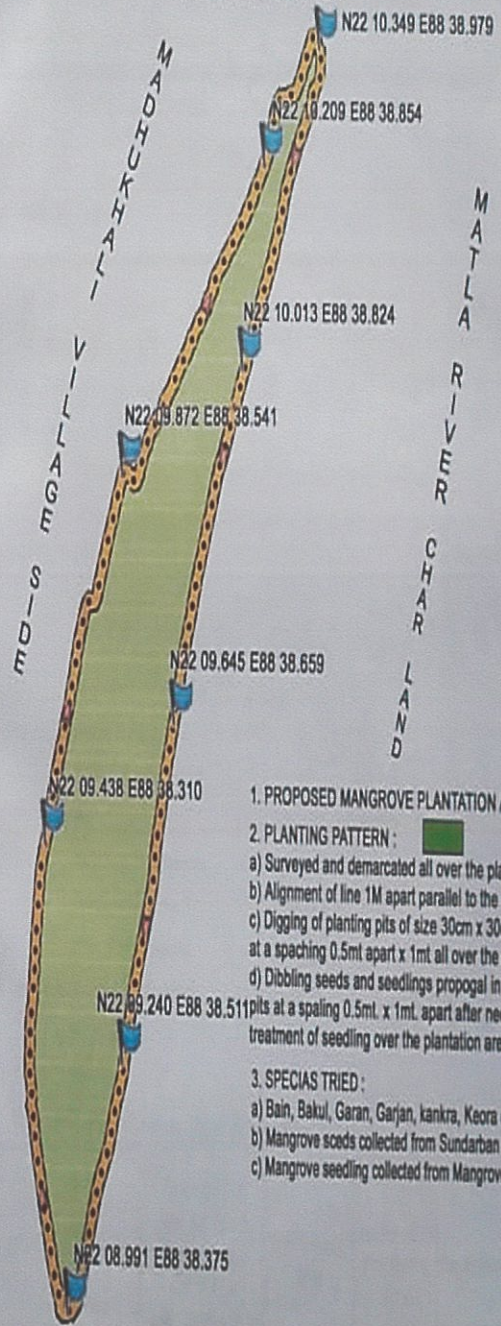
Beat MATLA

Area 40 Ha.

Scheme M.G.N.R.E.G.A., SANCTION NO-12/MT/2020-2021
WORK CODE- 3216/DP/321002040943845

Year 2020 - 2021

REGENERATION PLAN MAP SHOWING THE AREA OF MANGROVE PLANTATION-2020
UNDER MATLA BEAT, MATLA RANGE 24 PARGANAS SOUTH DIVISION
GRAM PANCHAYET: ITKHOLA, PANCHAYET SAMITI: CANNING-1, MOUJA: MADHUKHALI
AT MADHUKHALI VILLAGE SIDE, MATLA RIVER CHARLAND
AREA = 40 HECTOR, POINT = 770, SCALE = 0.2 MI, LENGTH CALCULATION = 13.6 KM
AS PAR GPS LOCATION



1. PROPOSED MANGROVE PLANTATION AREA

2. PLANTING PATTERN :

- Surveyed and demarcated all over the plantation area.
- Alignment of line 1M apart parallel to the water line.
- Digging of planting pits of size 30cm x 30cm x 45cm at a spacing 0.5mt apart x 1mt all over the plantation area.
- Dibbling seeds and seedlings propogal in the dug out pits at a spaling 0.5mt. x 1mt. apart after necessary treatment of seedling over the plantation area.

3. SPECIAS TRIED :

- Bain, Bakul, Garan, Garjan, kanakra, Keora etc
- Mangrove seeds collected from Sunderban RF area.
- Mangrove seedling collected from Mangrove Nursery.

SURVEYED BY

Kundal Pr
Forest Beat Officer
Matla Range
24 Parganas (S) Division

SUBMITTED BY

Pr
Forest Range Officer
Matla Range
24 Parganas (S) Division

CHECKED BY

Pr
Asst. Divisional Forest Officer
24 Parganas South Division

APPROVED BY

Pr
Divisional Forest Officer
24 Parganas (South) Division

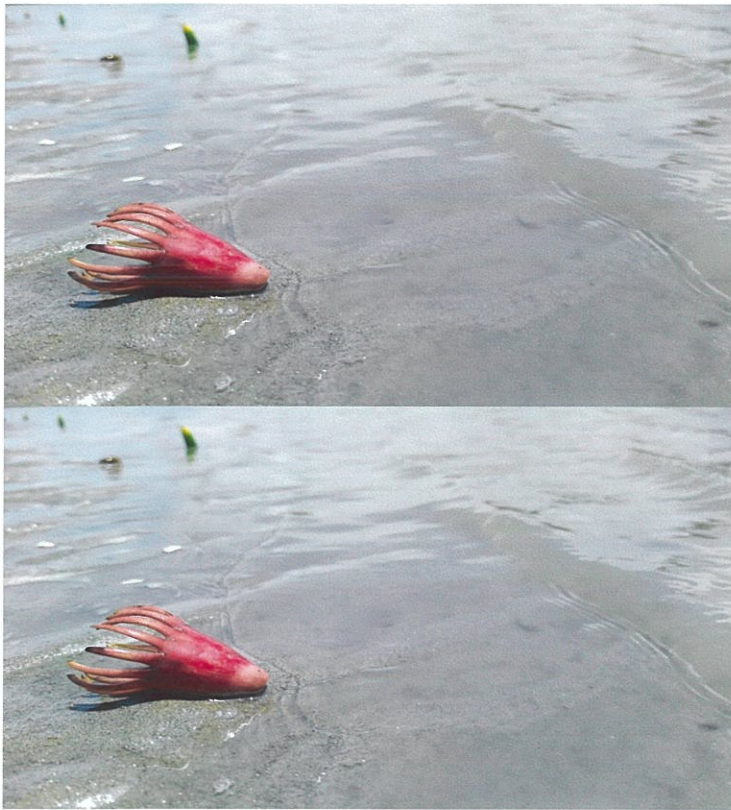
0.2 mi



OFFICERS VISITING PLANTATION SITES

CONCLUSION

This massive mangrove plantation will reduce the pressure or velocity of super cyclonic storms. This will also help us to maintain our ecological balance by act as carbon sink or reservoir. In future this sequestrated carbon will be credited in the international level.



THE JOURNEY (From Propagule to plant)