



DISTRICT ENVIRONMENT PLAN

SOUTH 24 PARGANAS DISTRICT

WEST BENGAL

2023



OFFICE OF THE DISTRICT MAGISTRATE & COLLECTOR

SOUTH 24 PARGANAS

ALIPORE, KOLKATA - 700027



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TABLE OF CONTENTS

Sl.No	Particulars	Page No
1	Introduction	3
2	Brief Profile of District South 24 Parganas	5
2.1	District Administration	6
2.2	Location and Geography	7
2.3	Demography	7
2.4	Rivers, Wetlands & Water resources	9
2.5	Coastal areas	13
2.6	Geology and Hydrogeology	15
2.7	Groundwater Quality	15
2.8	Soil	16
2.9	Forests and Mangroves	16
2.10	Topography, Physiography and Land Use	20
2.11	Industrial Development	23
2.12	Mining Activity	24
2.13	Climate	25
3	Waste Management Plan	26
3.1	Solid Waste Management	26
3.2	Plastic Waste Management	31
3.3	C&D Waste Management	32
3.4	Bio – Medical Waste Management	34
3.5	Hazardous Waste Management.	37
3.6	E-Waste Management	39
4	Water Quality Management Plan	40
5	Domestic Sewage Management Plan.	43
6	Industrial Wastewater Management Plan	44
7	Air Quality Management Plan.	45
8	Mining Activity Management Plan	48
9	Noise Pollution Management Plan	49
10	Sundarban Mangroves Management Plan	51
11	Wetlands Management Plan	53
Annexure I	Water Quality Data –South 24 Parganas	56
Annexure II	Air Quality Data –South 24 Parganas	63
Annexure III	Important Environmental Laws and Regulations for Coastal Districts	64

CHAPTER - 1

Introduction

Hon'ble National Green Tribunal in *O.A. No. 710/2017* dated 15.07.2019 further in *O.A. No. 360 /2018, (M.A. No. 823/2018) (SLP (Civil) No. 2959/2014)*, dated 26/09/2019 ordered to form the District Committee (as a part of District Planning Committee under Article 243 ZD) for the preparation of District Environment Plan as a Constitutional provisions under Articles 243 G, 243 W, 243 ZD read with Schedules 11 and 12 and Rule 15 of the Solid Waste Management Rules,2016.

As per Hon'ble NGT Order dated 26/09/2018 in OA 360/2018, an inventory has been generated for South 24 Parganas District in the format developed by CPCB "OA 360 NGT District information plan.xlsx".

A meeting of the District Committee to formulate the District Environment Plan for South 24 Parganas District was held on 08/07/2021 and the first District Environment Plan was published in 2021 through the official website of the District's www.s24pgs.gov.in.

Further, in compliance of the order passed by the Hon'ble NGT on 08.02.2022 in the matter of OA 360/2018 and in connection with OA 351/2019 for updating and implementing District Environment Plan a meeting of the District Committee was held on 24/03/2022. As per resolution taken in the said meeting the District Environment Plan was updated with inclusion of Wetlands Management to its present form.

In the above said meeting the District Committee for South 24 Parganas has also been revised and extended comprising of the following members :

Sl. No	Designation	Position
1.	District Magistrate & Collector, South 24 Parganas	Chairman
2.	Additional District Magistrate (Land Reforms), South 24 Parganas	Convener
3.	Additional District Magistrate (Development), South 24 Parganas	Member
4.	Additional District Magistrate (Zilla Parishad), South 24 Parganas	Member
5.	CMOH, South 24 Parganas Health District	Member
6.	CMOH, Diamond Harbour Health District	Member
7.	Chief Engineer South, Irrigation & Waterways department	Member
8.	District Forest Officer, South 24 Parganas, South 24 Parganas	Member
9.	Officer in Charge, Environment, South 24 Parganas	Member
10.	Officer in Charge, Municipal Affairs, South 24 Parganas	Member
11.	Officer in Charge, Information Technology, South 24 Parganas	Member
12.	District Nodal Officer, MGNREGA, South 24 Parganas	Member
13.	Dy. Secretary Zilla Parishad, South 24 Parganas	Member
14.	Executive Officer, GBDA, South 24 Parganas	Member
15.	Regional Transport Officer, South 24 Parganas	Member
16.	Sr. Environmental Engineer, West Bengal Pollution Control Board, Alipore	Member

17.	Executive Engineer, PHED and SWO-I, South 24 Parganas	Member
18.	Executive Engineer, PHED and ED, South 24 Parganas	Member
19.	Sr. Geologist, South 24 Parganas	Member
20.	District Information & Cultural Officer, South 24 Parganas	Member
21.	General Manager, District Industries Centre, South 24 Parganas	Member
22.	Executive Officer, Baruipur Municipality	Member
23.	Executive Officer, Budge Budge Municipality	Member
24.	Executive Officer, Joynagar Majilpur Municipality	Member
25.	Executive Officer, Diamond Harbour Municipality	Member
26.	Executive Officer, Maheshtala Municipality	Member
27.	Executive Officer, Pujali Municipality	Member
28.	Executive Officer, Rajpur Sonarpur Municipality	Member
29.	Representative of the Chairman, District Legal Services Authority	Member
30.	Representative of the Superintendent of Police, Baruipur Police District	Member
31.	Representative of the Superintendent of Police, Sundarban Police District	Member
32.	Representative of the Superintendent of Police, Diamond Harbour Police District	Member

This DEP has been prepared in line with the model District Environment Plan (DEP) of CPCB and updated with inclusion of Wetlands Management Plan in compliance of the Order of the Hon'ble National Green Tribunal and covers following thematic areas:

1. Waste Management Plan
 - o Solid Waste Management
 - o Plastic Waste Management
 - o C & D Waste Management
 - o Biomedical Waste Management
 - o Hazardous Waste Management
 - o E-Waste Waste Management
2. Water Quality Management Plan
3. Domestic Sewage Management Plan
4. Industrial Wastewater Management Plan
5. Air Quality Management Plan
6. Mining Activity Management plan
7. Noise Pollution Management Plan
8. Sundarban Mangroves Management Plan
9. Wetlands Management Plan

Periodic review of the environment plan will be done by the District Committee and action points as identified in the plan shall be taken up with all concerned offices and departments for timely implementation under the overall supervision and guidance of the committee.

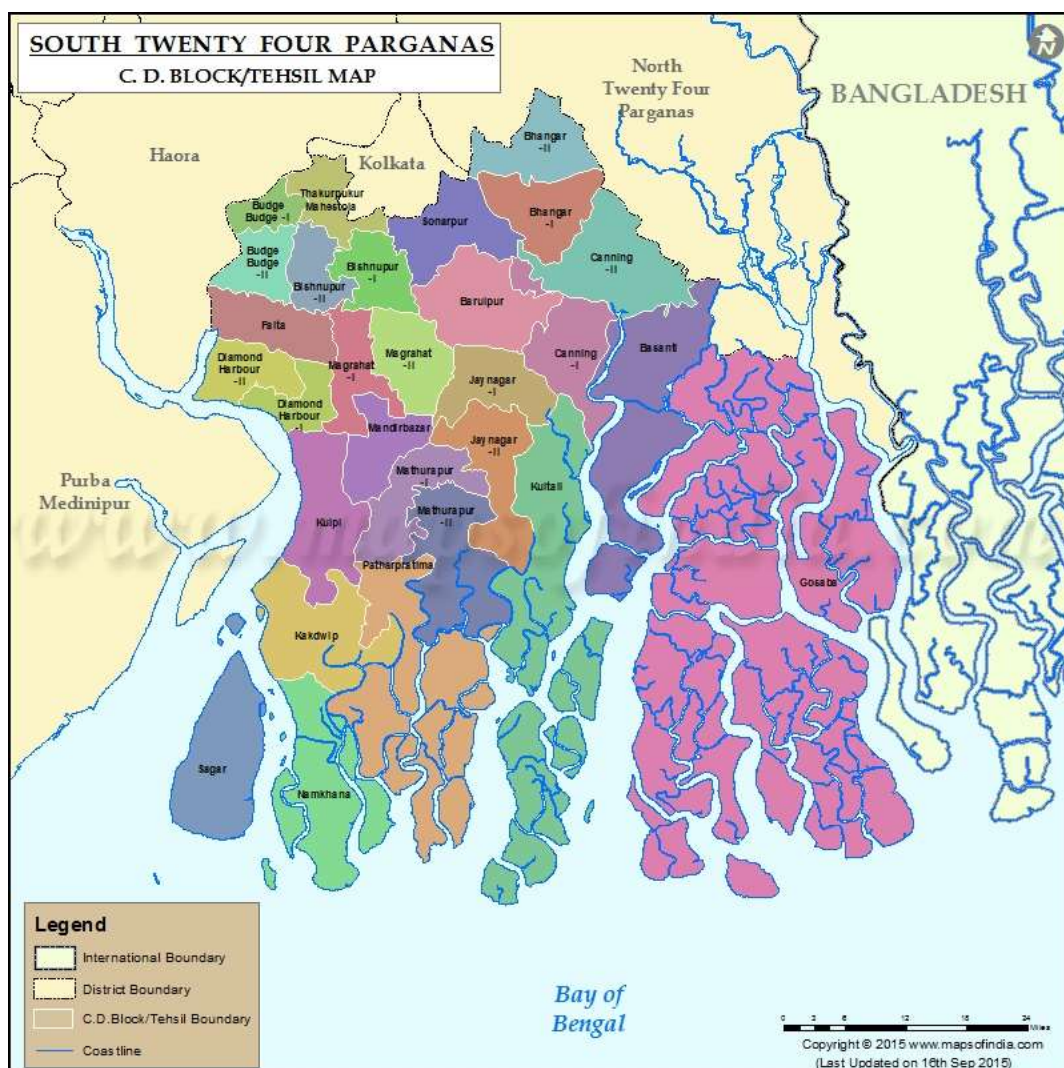
CHAPTER - 2

Brief Profile of the District

The name of 24 Parganas District is derived from the number of Parganas (divisions) contained in the zamindari of Kolkata, which was ceded to the East India Company by Mir Jafar in 1757. This district was split into two districts – North 24 Parganas and South 24 Parganas. The South 24 Parganas district got its recognition as full-fledged district on 1st March, 1986.

The present South 24 Parganas, headquartered at Alipore, is the largest district of West Bengal by area : 9960 Sq KM and the second largest by population with 81,61,961 (Males : 41,73,718 Females : 39,88,183 :Census 2011). The State of West Bengal has area of 88,752Sq KM with the population of 9,13,47,736 (Census 2011).

The district has the total forest coverage of 4,220 Sq KM (Reserved: 4,177 Sq KM, Protected: 42 Sq KM and Unclassed: 1 Sq. KM).



2.1 District Administration

A. Administrative Set Up

The District Magistrate is in the helm of the district. The district has 5 Sub- divisions, 33 Police Stations, 29 Community Development Blocks-Panchayat Samities , 7 Municipalities and 312 Gram Panchayats for 4,324 villages .

The District Magistrate is responsible for the overall governance of the district including law and order. He/She is assisted by a number of Additional District Magistrates and a number of district level Officers in discharging the responsibility towards the management of the administration. At the Sub- divisional level, this responsibility rests on the Sub-divisional Officers. At the lowest stair of administrative ladder, each of the twenty-nine Blocks has a Block Development Officer, who in turn, is assisted by the Block level Officers of various departments for smooth running of the field level administration.

B. Local Institutions

As a policy decision, the State of West Bengal has a decentralized model of development. The development of an area of the district is undertaken by the elected representatives. The task for implementing those decisions and overseeing the progress of the projects rests on the administration of the respective level. The apex institution for local governance of the district is the Zilla Parishad. For each of the 29 CD Blocks, the corresponding local governance institution is the respective Panchayat Samity. At grassroot levels, there are 312 Gram Panchayats. The District Magistrate functions as the ex-officio Executive Officer of the Zilla Parishad. The BDO functions as the ex-officio Executive Officer of the concerned Panchayat Samity. At village level, the local residents attend Gram Sansad meetings and participate actively in the village development activities. In the municipal areas of the district, elected Municipal Boards oversee the overall development of urban areas through several Municipal Committees. At the urban grass root level, each municipal wards have a ward committee that formulates urban development schemes for the ward and supervises and monitor their executions.

Sl.	Name of the Sub-division	Blocks under Sub-division	Municipalities under Sub-division
1	Alipore (Sadar)	Bishnupur-I, Bishnupur-II, Budge Budge-I, Budge Budge-II & T / Maheshtala	Budge Budge, Pujali, Maheshtala.
2	Baruipur	Baruipur, Bhagore-I, Bhagore-II, Joynagar-I, Joynagar-II, Kultali & Sonarpur.	Baruipur, Rajpur Sonarpur, Joynagar Majilpur.
3	Diamond Harbour	D\Harbour-I, D\Harbour-II, Falta, Kulpi, Magrahat-I, Magrahat-II, Mandirbazar, Mathurapur-I & Mathurapur-II.	Diamond Harbour.
4	Kakdwip	Kakdwip, Namkhana, Patharpratima & Sagar.	Nil
5	Canning	Basanti, Canning-I, Canning-II, Gosaba	Nil

2.2 Location and Geography

South 24-Parganas district is located between 22°30'45" to 20°29'00" North latitude and between 89°4'56" and 88°3'45" East longitudes, with a total geographical area of 9,960 sq.km. It is the largest district in West Bengal, and Alipore is the district headquarter town. District is bounded by the river Hooghly in the west, Bay of Bengal in the south, Kolkata city and North 24 Parganas in the north. It shares its eastern boundary with Bangladesh and Bidya and Matla River.

Shady trees of lush green forests of Sundarbans, paddy fields adjacent to interlacing network of rivers, remnants of ancient monuments, temples, masjids and churches creates the diversified backdrop of district South Twenty-Four Parganas. South 24 Parganas is famous for:

Kapil Muni's Ashram –Ganga Sagar Mela:

The famous pilgrimage of Kapil Muni Ashram at Ganga Sagar is located in the Sagar Island in the mouth of sacred river Ganga as a continental shelf of Bay of Bengal. Kapil Muni is believed to be a saint with heavenly powers and his ashram at this place has mythological links of the story of descend of river Ganga from the heaven to the mortal earth by King Bhagirath, the descendant of Suryavanshi King Sagar. The Sagar Island is very famous for the pilgrimage of the Hindu devotees across the country and every year the famed Ganga Sagar Mela is organised here to commemorate the Makar Sankranti (Winter Solstice). This Mela is undoubtedly the biggest event of the district and during the festivities; millions of pilgrims across the country come to the island to take a holy deep in the confluence on the auspicious day of Makar Sankranti (14th or 15th of January every year).

The Royal Bengal Tiger of Sundarban

The Indian part of the world's largest mangrove ecosystem of Sundarban is mostly spread over the district South Twenty-Four Parganas and Royal Bengal Tiger marks the symbol of this large forest. This large mammal once ruled the forests of Sundarban. With enlargement of human habitation, it became prey to the decrease in habitational area and frequent attack of the poachers. In 2010, Royal Bengal Tigers have been marked as 'endangered' by the International Union for Conservation of Nature. At present there are about only 100 tigers remaining in Indian part of the Sundarbans.

2.3 Demography

The district has area of 9,960 sq Km with population of 69,06,689 (Rural Population Males 29,97,270, Females: 28,23,199 Total: 58,20,469, Urban Population Males 5,67,723, Females: 5,18,497, Total: 10,86,220) in 2001 census, which has become 81, 61, 961 in 2011 census. (Rural Population Males 31,09,219, Females: 29,64,969 Total: 60,74,188, Urban Population Males 10,23,214, Females: 10,23,214, Total: 20,87,773).

The population density is staggeringly high in Sadar, Diamond Harbour and Baruipur subdivisions with the highest concentration expectedly in Sadar Sub Division and the lowest in Kakdwip Sub Division.

Census 2011 Data of South 24 Parganas District

Description	2001	2011
Population	69.07 Lakhs	81.62 Lakhs
Actual Population	6,906,689	8,161,961
Male	3,564,993	4,173,778
Female	3,341,696	3,988,183
Population Growth	20.85%	18.17%
Area Sq. Km	9,960	9,960
Density/km2	693	819
Proportion to West Bengal Population	8.61%	8.94%
Sex Ratio (Per 1000)	937	956
Child Sex Ratio (0-6 Age)	964	963
Average Literacy	69.45	77.51
Male Literacy	79.19	83.35
Female Literacy	59.01	71.4
Total Child Population (0-6 Age)	1,050,120	1,025,679
Male Population (0-6 Age)	534,626	522,552
Female Population (0-6 Age)	515,494	503,127
Literates	4,067,343	5,531,657
Male Literates	2,399,713	3,043,277
Female Literates	1,667,630	2,488,380
Child Proportion (0-6 Age)	15.20%	12.57%
Boys Proportion (0-6 Age)	15.00%	12.52%
Girls Proportion (0-6 Age)	15.43%	12.62%

Source : <https://www.census2011.co.in/census/district/17-south-twenty-four-parganas.html>

Block and Municipality-wise Population 2011

Sl. No.	Block / Municipality	Population 2011 (Provisional Population Totals)			
		Persons	Males	Females	Others
1	Baruipur	432870	222326	210514	30
2	Basanti	336151	171549	164597	5
3	Bhangar - I	249120	127876	121237	7
4	Bhangar - II	246700	127708	118981	11
5	Bishnupur - I	232376	118888	113462	26
6	Bishnupur - II	214477	109731	104746	0
7	Budge Budge - I	112947	57866	55081	0
8	Budge Budge - II	192118	98939	93178	1
9	Canning - I	304704	155389	149304	11
10	Canning - II	252622	128926	123695	1
11	Diamond Harbour - I	155842	79814	76027	1
12	Diamond Harbour - II	190796	97898	92891	7
13	Falta	249488	127796	121690	2
14	Gosaba	246682	126204	120478	0
15	Jaynagar - I	262336	135156	127176	4
16	Jaynagar - II	251206	129082	122122	2
17	Kakdwip	281502	144272	137226	4
18	Kulpi	281597	144202	137392	3
19	Kultali	228988	117775	111213	0
20	Magrahat - I	268747	138332	130411	4
21	Magrahat - II	304702	157171	147520	11
22	Mandirbazar	211706	109277	102425	4
23	Mathurapur - I	194715	100072	94638	5
24	Mathurapur - II	220068	113790	106277	1
25	Namkhana	182728	93506	89221	1
26	Patharpratima	331605	170081	161521	3
27	Sagar	211993	109827	102165	1
28	Sonarpur	219981	112646	107330	5
29	Thakurpukur Mahestala	176239	89422	86814	3
30	Baruipur (M)	53191	26864	26321	6
31	Budge Budge (M)	76858	39819	37039	0
32	Diamond Harbour (M)	41798	21069	20729	0
33	Jaynagar Mazilpur (M)	26031	13301	12730	0
34	Maheshala (M)	449423	231037	218379	7
35	Pujali (M)	37063	18995	18065	3
36	Rajpur Sonarpur (M)	423806	215976	207823	7
Total		8153176	4182582	3970418	176

2.4 Rivers, Wetlands and Water Resources

A. Water Bodies:

The district's main rivers are all in its Sundarban zone. Sundarban starts from the midst of the Police Station: Kulpi, better known as Dampier – Hodges line, drawn in 1831. The rivers are Hooghly, the largest in the district, Matla, Vidyadhari, Raimangal, Haribhanga, Thakuran, Gosaba, Saptamukhi, besides them there are about 21 tributaries therein.

The district has numbers of river, the major rivers are: -

- Matla River
- Raimangal River
- Saptmukhi River
- Hooghly River
- Bidydhari River
- Thakuran River
- Piyali River

Matla River

Matla River forms a wide estuary in and around the Sundarbans in South 24 Parganas district in the Indian state of West Bengal. The main stream of the Matla River is divided into two arms near Purandar. One passes through Kultali-Garanbose and then passes through the Sundarbans. The other passes through Basanti, Pathankhali, Surjyaberia, Masjidbati and then meets Bidyadhari River

Raimangal River

Raimangal River is a tidal estuarine river in and around the Sundarbans in South 24 Parganas district in the Indian state of West Bengal and Satkhira District in Bangladesh. The Ichamati breaks up into several distributaries below Hingalganj the chief of which are the Raimangal, Bidya, Jhilla, Kalindi and Jamuna. These fan out into wide estuaries in the Sundarbans. It forms the international boundary between India and Bangladesh for some distance.

Saptamukhi River

Saptamukhi River is a tidal estuarine river in and around the Sundarbans in South 24 Parganas district in the Indian state of West Bengal. The Saptamukhi originates near Sultanpur and flows between Kulpi and Mathurapur blocks. It has a connection with the Muri Ganga River and Deogra Khal. It falls to the Bay of Bengal with a wide mouth after traversing about 80 kilometres (50 mi).

Hooghly River

The Hooghly River or the Bhāgirathi-Hooghly, called 'Ganga' traditionally, is an approximately 260 kilometres (160 mi) long distributary of the Ganges River in West Bengal, India. It splits from the Ganges as a canal in Murshidabad District at the Farakka Barrage. Hooghly river passes through Murshidabad, Nadia, Purba Bardhaman, Hooghly, Howrah, North 24 Paraganas, Kolkata, South 24 Paraganas.

Bidyadhari River

Bidyadhari River (also spelt Bidyadhari or simply called Bidya), is a river in the Indian state of West Bengal. It originates near Haringhata in Nadia district and then flows through Deganga, Habra and Barasat areas of North 24 Parganas before joining the Raimangal River in the Sundarbans. Eastern boundary of the district is demarcated by Bangladesh and Bidya & Matla River. Bidyadhari river, Matla river forms a wide estuary in and around the Sundarbans in South 24 Parganas district in the Indian state of West Bengal.

Thakuran River

Thakuran River (also called Jamira) is a tidal estuarine river that forms a wide estuary in and around the Sundarbans in South 24 Parganas district in the Indian state of West Bengal.

Piyali River

It originates near Jaynagar and has a number of connections with the Saptamukhi and forms the boundary between Mathurapur and Jaynagar blocks. Piyali River is a tidal estuarine river in and around the Sundarbans in South 24 Parganas district in the Indian state of West Bengal. The Piyali leaves the Bidyadhari River 14 kilometres (9 mi) below Bamanghata and flows south and south-west till it joins the Matla River about 32 kilometres (20 mi) below Canning. The Piyali links to the Matla through the Kultala gang which also links to the Thakuran

B. Wetlands

“Wetland” means an area of marsh, fen, peatland or water; whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters, but does not include river channels, paddy fields, human-made water bodies/tanks specifically constructed for drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes.

“Wetlands Complexes” means two or more ecologically and hydrologically contiguous wetlands and may include their connecting channels/ducts;

Wetlands are highly productive ecosystems which support rich biodiversity and provide a wide range of ecosystem services such as water storage, water purification, flood mitigation, erosion control, aquifer recharge, microclimate regulation, aesthetic enhancement of landscapes etc.

Many wetlands are threatened by reclamation and degradation through drainage and landfill, pollution (discharge of domestic and industrial effluents, disposal of solid wastes), hydrological alteration (water withdrawal and changes in inflow and outflow), over-exploitation of their natural resources resulting in loss of biodiversity and disruption in ecosystem services provided by wetlands.

East Kolkata Wetlands (EKW)

A Ramsar designated wetland of international importance, located in the eastern outskirts of Kolkata city covering a total area of 12.5 km² (12,500 ha). It comprises large number of water bodies, sewage fed fish farms, agricultural lands and also some built up areas. Administratively, these wetlands are located in Kolkata municipal area and in the districts of North and South 24 Parganas.

Almost the majority of the land schedule under East Kolkata Wetlands fall under the blocks Kolkata (ATM), Bhangore-I, Bhangore-II and Sonarpur of this district, which are both ecologically sensitive and protected by the EKW Management Act, 2006.

These water bodies include man-made and as well as natural ponds. Of the total area of 12,500 ha, slightly less than half (~47%) is covered with water bodies, nearly 43% is fish/agriculture farming area, and the remaining 10% consists of built-up area (both rural and urban). These wetlands are unique and used to treat sewage generated here through pisciculture. There are various deep canals, which flow with very low velocity that bring sewage from the city, and circulate in the wetlands. These canals act as facultative lagoons, and while fish ponds act as maturation ponds for completing the sewage treatment. Solid waste also dumped here. So, these wetlands provide natural treatment for both sewage and solid waste, while providing benefits to the local people via fish farming. Outflow from fishponds flows naturally into streams, for further disposal into sea via natural drainage channels/rivers.

Besides providing the benefits of waste treatment and fish farming, wetlands has very rich biodiversity and is a waterfowl habitat. It is also known migratory birds. There are about 100 plant species recorded in and around the EKW. Several kinds of water hyacinths grow here, which also control land erosion. Area is known for paddy, coconut, vegetable cultivation. Fish species farmed in these sewage fed ponds include silver carp and tilapia. There are about 20 type of mammals and several reptiles in this area, which include: marsh mongoose, small Indian mongoose, Palm Civet, Small

Indian Civet, Checkered keel back, smooth water snake, Buff striped keel back, and bronze back tree snake.

However due to its location just outside Kolkata city and the neighbouring rapidly developing New Town area of Rajarhat, has put tremendous pressure on the existence and functioning of this wetland ecosystem. Government has set up a EKW Management Authority to regulate the activities in and around the EKW.

Sundarban Wetland

Sundarban Wetland is located within the largest mangrove forest in the world, the Sundarbans, that encompasses hundreds of islands and a maze of rivers, rivulets and creeks, in the delta of the Rivers Ganges and Brahmaputra on the Bay of Bengal in India and Bangladesh. The Indian Sundarban, covering the south-westernmost part of the delta, constitutes over 60% of the country's total mangrove forest area and includes 90% of Indian mangrove species. The mangrove forests protect the hinterland from storms, cyclones, tidal surges, and the seepage and intrusion of saltwater inland and into waterways. They serve as nurseries to shellfish and finfish and sustain the fisheries of the entire eastern coast. The Sundarban Tiger Reserve is situated within the Site and part of it has been declared a "critical tiger habitat" under national law and also a "Tiger Conservation Landscape" of global importance. The Sundarbans are the only mangrove habitat which supports a significant population of tigers, and they have unique aquatic hunting skills. The Site is also home to a large number of rare and globally threatened species such as the critically endangered northern river terrapin (Batagur baska), the endangered Irrawaddy dolphin (*Orcaella brevirostris*), and the vulnerable fishing cat (*Prionailurus viverrinus*). Two of the world's four horseshoe crab species, and eight of India's 12 species of kingfisher are also found here. The uniqueness of the habitat and its biodiversity, and the many tangible and intangible, local, regional and global services they provide, makes the Site's protection and management a conservation priority.

Source: rsis.ramsar.org

Other Wetlands

The District of South 24 Parganas is home to a large number of wetlands and water bodies. Ecologically, wetlands of South 24-Parganas District can be categorised as (i) freshwater wetlands and (ii) brackishwater wetlands located near estuary in the coastal region. The freshwater wetlands are rain water reservoirs, flood plains, beels and boars which are characterised with sweet water without any trace of salinity. The brackishwater wetlands are categorised as saline water bodies viz., bheries, gheries, jalkars, fisheries etc., with salinity varying between 1 ppt and 30 ppt. The presence or absence of tidal effect in these water bodies and the distance of these wetlands from the sea or estuaries virtually determine the salinity and lead towards categorization of low, medium and high saline brackish water wetlands. (SOURCE: RECORDS OF THE ZOOLOGICAL SURVEY OF INDIA; WETLAND FAUNAL RESOURCES OF WEST BENGAL. I. NORTH AND SOUTH 24-PARGANAS DISTRICTS)

C. Water Resources:

The normal annual rainfall in the district is in the tune of 1535 – 1796 MM (2011). The ground water bearing aquifers are present in the district within quaternary and tertiary sediments and generally occur under confined condition in the depth range of 75 to 360 metres with numerous alterations of clayee and sandy layers of varying

thickness. Besides, rain water and ground water, artificial khals like Bhangar Khal, Kulpi Khals and Surjapur Khal and others are the other sources of water resources.

2.5 Coastal areas

The coast areas of the district stretch among the blocks Basanti, Canning – I, Canning-II, Diamond Harbour-I, Gosaba, Joynagar-II, Kakdwip, Kulpi, Kultali, Mathurapur-I, Mathurapur-II, Namkhana, Patharpratima, Sagar, which have long lines of CRZs within their boundaries.

The Sunderbans in the South-24 Parganas have an intricate coastline, clusters of deltas with interlinked channels, creeks, and estuaries. Deltaic regions are mostly clayey due to high deposit of sediments (8million tones/yr) through the Hooghly system. A clayey blanket covering gravels of sandstone, siltstone, and quartz indicate quaternary age of the area. A neo tectonic and morphogenic tilt between 12th and 16th century resulted in an uplift of the western part of the Ganga towards the Padma and hastened the deltaic formation. Consequently, West Bengal does not receive the fertile alluvium as before and the terrain is not de-salinated by river floods. The beaches and inlets, creeks, and mangrove swamps, mudflats, coastal dunes and sand flats are the characteristics of the area.

The most important climatic factor is the high frequency of violent cyclonic depressions (4-8ys) in the Bay of Bengal. The head of the funnel-shaped Bay of Bengal poses perhaps the most serious threat from surges driven by the storm waves reaching 5-8 m high.

The Hooghly system receives domestic, agricultural and industrial wastes containing cellulose, acids, alkalis, nitrogenous compounds, heavy metals, fly ash, phenol, sulphides and pesticide residues which adversely affect the fish and fish food organisms near the outfall regions. Matlah and other eastward estuaries receive Calcutta and suburban sewage with organic load, heavy metals, ammonia, and synthetic detergents flowing down through the Kulti and Bidyadhari estuaries. With the location of the oil reserves, the environment may be threatened by hydrocarbons and other pollutants also in the near future. Estuaries are dying for want of headwater flow and siltation, resulting in the formation of land masses and change in the water flow leading to soil erosion and landslides. Due to poor drainage facilities of the embanked islands, wetlands are common and are used for brackish water farming. The Midnapore coast provides favourable port facilities because of stable soil and approach roads. However, in the Sundarbans, unstable banks, intervening wetlands, silting of beds and changing topography do not permit permanent harbouring facilities.

In the coastal West Bengal, the problem of freshwater is fairly acute because of extensive abstraction from a depth of 700-1,000 mtr. The shallow salt water table often renders stored water in ditches and ponds brackish and the surface soil saline.

Coastal Erosion

Researchers from School of Oceanography, Jadavpur University undertook a time series analysis of the change in the shape, size and geomorphic features of the islands over a period of 32 years (1969-2001). The important observations regarding the erosion accretion pattern of the island system can be summarized as follows:

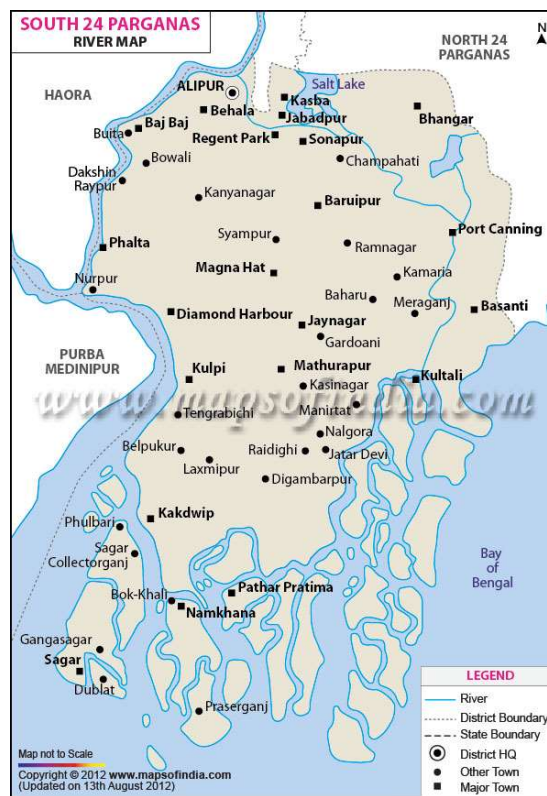
Total erosion over the 30 years' time span is estimated to be 162.879 sq.km. Few islands like Lohachara and Bedford (6.212 sq. km.) have already vanished from the map.

Erosion zones are most prominent among the 12-sea facing southern islands from Sagar to the west to Bhangaduni in the east. The southwestern corners of the islands are particularly susceptible to sustained erosion. Erosion is also seen along the sea facing shoreline that is oblique to the incoming waves.

The western banks of the inner islands are more vulnerable to erosion than the eastern banks and the rate of retreat of western banks is more severe. Accretion is localized in the inner estuaries particularly along eastern and northern margins and along the coasts of islands trending parallel to the incoming waves. The amount of land accretion over the past 30 years is estimated at 82.505 sq. km.

Within the island system, the Sagar Island has suffered the bulk of erosion with an aerial loss of 30 sq. km. with marginal accretion.

The net loss in land area in the eastern part of West Bengal coastal zone is probably due to erosion and/or submergence attributed to sea level rise consequent upon recent climate change and global warming. Therefore, in this sector of West Bengal coast coastal erosion is a key issue in coastal zone management.



2.6 Geology and Hydrogeology

South 24 Parganas district is located in the lower deltaic plain on the composite Gangetic Delta and is covered by the Quaternary sediments deposited by the Ganga and its tributaries. The top of the alluvium is clayey in nature with varying thickness of 15 to 75 m. Fine sand and silty-clay capping also occurs in small patches in the alluvium. Underlying the clay blankets occur a huge thickness of unconsolidated sediments

composed of silt, fine to coarse grained sand and gravel with increasing thickness towards east and southeast. The gravel zone is underlain by another extensive clay zone at varying depths. There is a succession of Tertiary and Mesozoic formations within the depth range of 350 m to 4000 m. These geological horizons are sloping gently towards south-southeast. Other than this, no prominent rock and mineral formations are found in the project district.

In South 24 Parganas district, the ground water bearing aquifers are present within Quaternary and Tertiary sediments and generally occur under confined condition in the depth range of 75m to 360m with numerous alternations of clayey and sandy layers of varying thickness. The confined aquifers are divided into two groups, from north to extreme south. The upper one, usually in the depth span of 20m to 160m has a sandy gravel layer as a marker bed at its base which pinches out eastward. The ground water in general except at a few places occurring in this upper group of aquifers, is brackish to saline (chloride ranging from 1750 to 6300 ppm) and is not in use. The lower group of aquifers occurring in the depth range of 160 m to 360 m, is separated from the upper group by a thick impermeable sticky clay bed which is laterally extensive with varying thickness. The ground water occurring in this lower group of aquifers is generally fresh and is used extensively. Groundwater level lies from 1.70 mbgl to 6.00 mbgl during pre-monsoon period and from 0.50 m to 5.80 mbgl during post-monsoon period. Productive fresh water bearing zones are in depths ranging from 115 to 402 mbgl and are capable to yield 100 to 120 m³/h, with drawdown ranging from 2.3m to 16.5m. Transmissivity values range from 400 to 6500 m²/day and the Storativity values range from 0.0002 to 0.0015.

2.7 Groundwater Quality

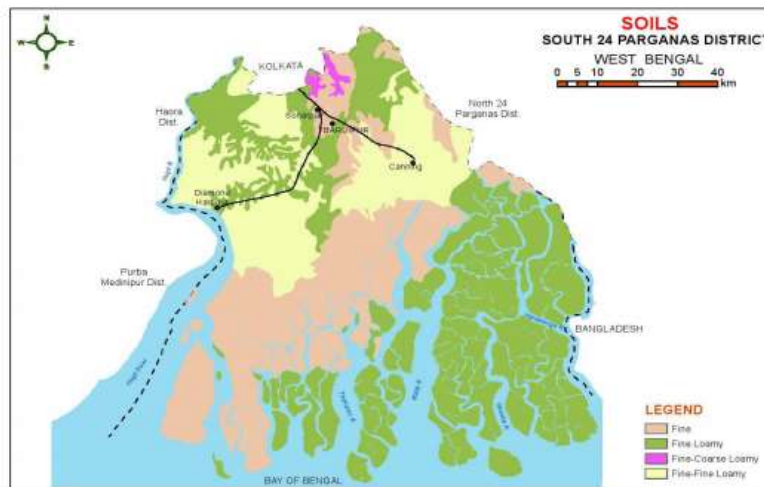
Groundwater from unconfined aquifer except a few places is fresher within 60 mbgl than the deeper aquifers within 60 to 125 mbgl. Ground water from the unconfined aquifer is generally neutral to mildly alkaline with pH ranging from 7.2 to 8.1. Ground water in the western and central part of the district is primarily a Calcium-Magnesium-Bicarbonate type. The aquifer within the depth range of 150 mbgl in this area is generally marked by brackishness where chloride value ranges from 1750 to 6300 ppm. The deeper group of confined aquifers occurring within the depth range of 160 to 350 mbgl in the southern and south-eastern part of the district contain fresh water. The ground water is neutral to mildly alkaline with pH ranging from 7.4 to 8.1. Conductivity ranges from 714 to 2692 μ s/cm and the chloride value ranges from 14 to 596 ppm. In the coastal belt of this district the aquifers under semi confined to confined condition contain ground water with very high dissolved salts.

Arsenic content of groundwater has been found to be beyond permissible limit of 0.05 ppm in a number of localized patches in sporadic manner in 9 blocks-Baruipur, Sonarpur-Bhangar-I and II, Joynagar-I, Bishnupur-I and II, Magrahat-II and Budge Budge-II in this district.

2.8 Soil

Soils in South 24 Parganas are mostly sandy loam and clay loam in texture and contain large percentage of silt and clay with good water holding capacity. Soils are highly fertile. Only in areas close to rivers, soils are sandy clay. As per US soil taxonomy soil type in the district are broadly classified in to three groups: Entisols comprises of mainly sandy loam which is found in the western corner of the district; Alfisols which are typically deltaic alluvium soils, are present central part of the district, and Aridisols which are saline and saline-alkali in nature are present in the southern part of the district.

Soil Map of South 24 Parganas district



Source: NBSS & LUP Regional Centre, Calcutta

2.9 Forests and Mangroves

The district has forest coverage of 4,220 Sq KM (Reserved: 4,177 Sq KM, Protected: 42 Sq KM and Unclassed: 1 Sq KM). The deep dense forest, the murmur of the sparkling rivulets, various species of local and other migratory birds as Tern, Kingfisher, Heron, Cormorant, Egret, Seagull, White Bellied Sea Eagle, Whimprel, Black Tailed Godwit, Little Stint, Sandpiper, Golden Plover, Pintail, White-eyed Pochard, Dalmation Pelican, Ospery, Shaheen Falcon, Lesser Adjutant Stork & Estuarine Crocodiles basking in the wintry sunshine, Chinese Pangolin, Spotted and Axis Deer, Wild Boar, Rhesus Monkey, Leopard Cat, Indian Fishing Cat, Common Yellow Water Monitor, Marine Indian Soft/Flap shelled Olive Ridley Turtles, Gigantic Dolphin, Hard shelled Batagur, Terrapin, Pythons, King Cobra, various type of lizards and the feeling of emancipation in the lap of nature will certainly touch your mind.

The inaccessibility of Sunderbans (declared as a Tiger Reserve in 1973) is its biggest attraction and in the mystery-shrouded **Pirkhali, Gazikhali, Chora Ganjikhali, Deol Bharani, Bhagaban Bharani, Panchamukhani** and **Sunarkhari** one may have a glimpse of that awful beauty- A Born Man Eater- The Royal Bengal Tiger. One may also ascend the watch tower of **Sajnekhali, Sudhanyakhali, Do-Baanki, Marichjhapi, Burir Dabri** and **Netidhopani** overlooking an untamed forestscape and enjoy sights and sounds of nature resplendent in her pristine virginal beauty.

A. Sundarban Mangroves

This eco-region on the coast forms the seaward fringe of the delta and is the world's largest mangrove ecosystem, with 20,400 sq. km. (7,900 sq. mi.) of area covered. The dominant mangrove species *Heritiera fomes* is locally known as sundri or sundari from which the name of the forest had probably been derived. Twenty six of the fifty broad mangrove types found in the world grow well in the Sunderbans. Amongst them *Avicennia* spp., *Xylocarpus mekongensis*, *Xylocarpus Granatum*, *Sonneratia apetala*, *Bruguiera gymnorrhiza*, *Ceriops decandra*, *Aegiceras corniculatum*, *Rhizophora mucronata* are worth mentioning. The commonly identifiable vegetation that grow in the dense mangrove

forests at the Sundarbans are salt water mixed forest, mangrove scrub, brackish water mixed forest, littoral forest, wet forest and wet alluvial grass forests. It may be mentioned here that the core area of the Sundarbans National Park was created by World Wildlife Fund's '**Project Tiger**' in the year 1984. In 1989, UNESCO upgraded the Park and some of the surrounding region to the status of '**World Heritage Site**' upon following considerations:

1. *This is the only Mangrove Tiger Land on the Globe.*
2. *This is the largest Estuarine Delta in the world.*
3. *This has largest species of Mangroves in one area.*
4. *This is the last Great Coastal Wetland left in the world.*
5. *This has largest number of Royal Bengal Tigers in the world.*
6. *This has largest Species of Estuarine Crocodiles in the world.*

Sundarban Biosphere Reserve

It consists of following zones:

Core Zone (protected site for conserving biological diversity and undertaking non-destructive research and other low-impact uses like education etc.);

Buffer Zone (surrounding or adjoining the Core Zone, and is used for activities compatible with sound ecological practices); and

Transition Area (contain a variety of agricultural activities, settlements and other uses and in which local communities, management agencies, scientists, NGOs and other stakeholders work together to manage and develop the Area's resources).

Biosphere reserves are managed under the existing forest, wildlife and environmental related laws as applicable, and there are no other specific regulations.

B. Flora and Fauna :

In the year 1984, the district of South Twenty-Four Parganas became home to Sundarbans National Park covering an area of 1,330 sq. km. (513.5 sq. mi.). It shares the park with North Twenty-Four Parganas district and is also the home to four wildlife sanctuaries: Haliday Island, Lothian Island, Narendrapur, and Sajnekhali.

Flora

It is easily understood that from the above discussion that this area is rich in flora. Practically the whole district is covered with mature and active parts of Gangetic Delta. The southern plains surround the mature delta, the Sundarbans surrounds the active parts of Gangetic Delta. In the mature delta, cultivated crops have replaced the natural cover. Various kinds of vegetables, cereals, pulses, fibre plants, oil seed crops and other food accessories are found in the region. Rice is the most important cereal of the district. Exotic varieties of fruit trees, bamboo groves, flowers and scrubs are also found. In a comprehensive study performed by David Prain in 1903 it is seen that Sundarbans have a total of 245 genera and 334 plant species. The Sundarbans flora is characterised by the abundance of Sundari (*Heritiera fomes*), gewa (*Excoecaria agallocha*), goran (*Ceriops decandra*) and keora (*Sonneratia apetala*) all of which occur prominently throughout the area. There is abundance of dhundul or passur (*Xylocarpus granatum*) and kankra (*Bruguiera gymnorrhiza*) though distribution is discontinuous. Among palms, *Poresia coarctata*, *Myriostachya wightiana* and golpata (*Nypa fruticans*), and among grasses spear grass (*Imperata cylindrica*) and khagra (*Phragmites karka*) are well distributed.

Fauna

The Sundarbans provides a unique ecosystem and a rich wildlife habitat. According to the latest Tiger Census, the Sundarbans have about 270 tigers. But the encouraging fact is that the number of this endangered species is increasing. The Royal Bengal Tiger of Sundarban is one of the most majestic animals of the world. The Royal Bengal Tiger is designated as the National Animal of India. This majestic animal requires about 5 to 10 sq. km. area to roam around and 7.5 kg. of meat every day. About 17.5 per cent of the tiger's food comes from aquatic source. Tigers even are able to swim across the rivers. Sometimes the tigers enter the village locality and cattle become their easy prey. Often wood cutters, fishermen and honey collectors become the prey of tigers though only around 5 percent of the tigers are man eaters. Apart from tiger, there is much more world life. Most importantly, mangroves are a transition from the marine to freshwater and terrestrial systems and provide critical habitat for numerous species of small fish, crabs, shrimps and other crustaceans that adapt to feed and shelter, and reproduce among the tangled mass of roots, known as pneumatophores, which grow upward from the anaerobic mud to get the supply of oxygen. Animals like leopard (*Panthera pardus fusca*) and several other smaller predators such as the jungle cats (*Felis chaus*), fishing cats (*Prionailurus viverrinus*) and leopard cats (*Prionailurus bengalensis*) are also found in this jungle. Also, chital deer (*axis axis*), Indian muntjacs (*Muntiacus muntjak*), wild boars (*Sus scrofa*), rhesus macaque (*Macaca mulatta*) and about 30,000 spotted deer are found in the area. Sundarbans supports diverse biological resources which include at least 150 species of commercially important fish, 270 species of birds, 42 species of mammals, 35 reptiles and 8 amphibian species. This region is an important wintering area for migrant water birds also and is an area suitable for watching and studying avifauna. Some of the reptiles are predators too, including two species of crocodiles, the saltwater crocodile (*Crocodylus porosus*) and mugger crocodile (*Crocodylus palustris*), as well as the gharial (*Gavialis gangeticus*) and the water monitor lizards (*Varanus salvator*), all of which hunt on both land and water. Sharks and the Gangetic dolphins (*Platanista gangetica*) roam the waterways.

Avifauna

Sundarbans is the home of 170 species of bird life including the endemic brown-winged kingfishers (*Pelargopsis amauroptera*) and the globally threatened lesser adjutants (*Leptoptilos javanicus*) and masked finfoots (*Heliopais personata*) and birds of prey such as the ospreys (*Pandion haliaetus*), white-bellied sea eagles (*Haliaeetus leucogaster*) and grey-headed fish eagles (*Ichthyophaga ichthyaetus*). Other noteworthy birds found in this area are open billed storks, black-headed ibis, water hens, coots, pheasant-tailed jacanas, pariah kites, brahminy kites, marsh harriers, swamp partridges, red jungle fowls, spotted doves, common mynahs, jungle crows, jungle babblers, cotton teals, herring gulls, caspian terns, gray herons, brahminy ducks, spot-billed pelicans, great egrets, night herons, common snipes, wood sandpipers, green pigeons, rose-ringed parakeets, paradise flycatchers, cormorants, white-bellied sea eagles, seagulls, common kingfishers, peregrine falcons, woodpeckers, whimbrels, black-tailed godwits, little stints, eastern knots, curlews, golden plovers, pintails, white-eyed pochards, lesser whistling ducks etc.

Aqua fauna

Regarding the aqua fauna of the region, silver carp, barb, river eels, starfish, king crab, fiddler crab, hermit crab, prawn, shrimps, Gangetic dolphins, skipping frogs, common toads and tree frogs are found in abundance. One particularly interesting fish is the mudskipper, a gobioid that climbs out of the water into mudflats and even climbs trees.

Reptiles

An excellent number of reptiles are also found in Sundarbans. Some of the common ones are olive ridley turtles, sea snakes, dog faced water snakes, green turtles, estuarine crocodiles, chameleons, king cobras, salvator lizards, hard shelled batgun terrapins, Russels vipers, mouse gekkos, monitor lizards, curviers, hawks bill turtles, pythons, common kraits, green vine snake, checkered keelbacks and rat snakes. The river terrapin (*Batagur baska*), Indian flap-shelled turtles (*Lissemys punctata*), peacock soft-shelled turtles (*Trionyx hurum*), yellow monitors (*Varanus flavescens*), water monitors (*Varanus salvator*) and Indian pythons (*Python molurus*) are some of the resident species.

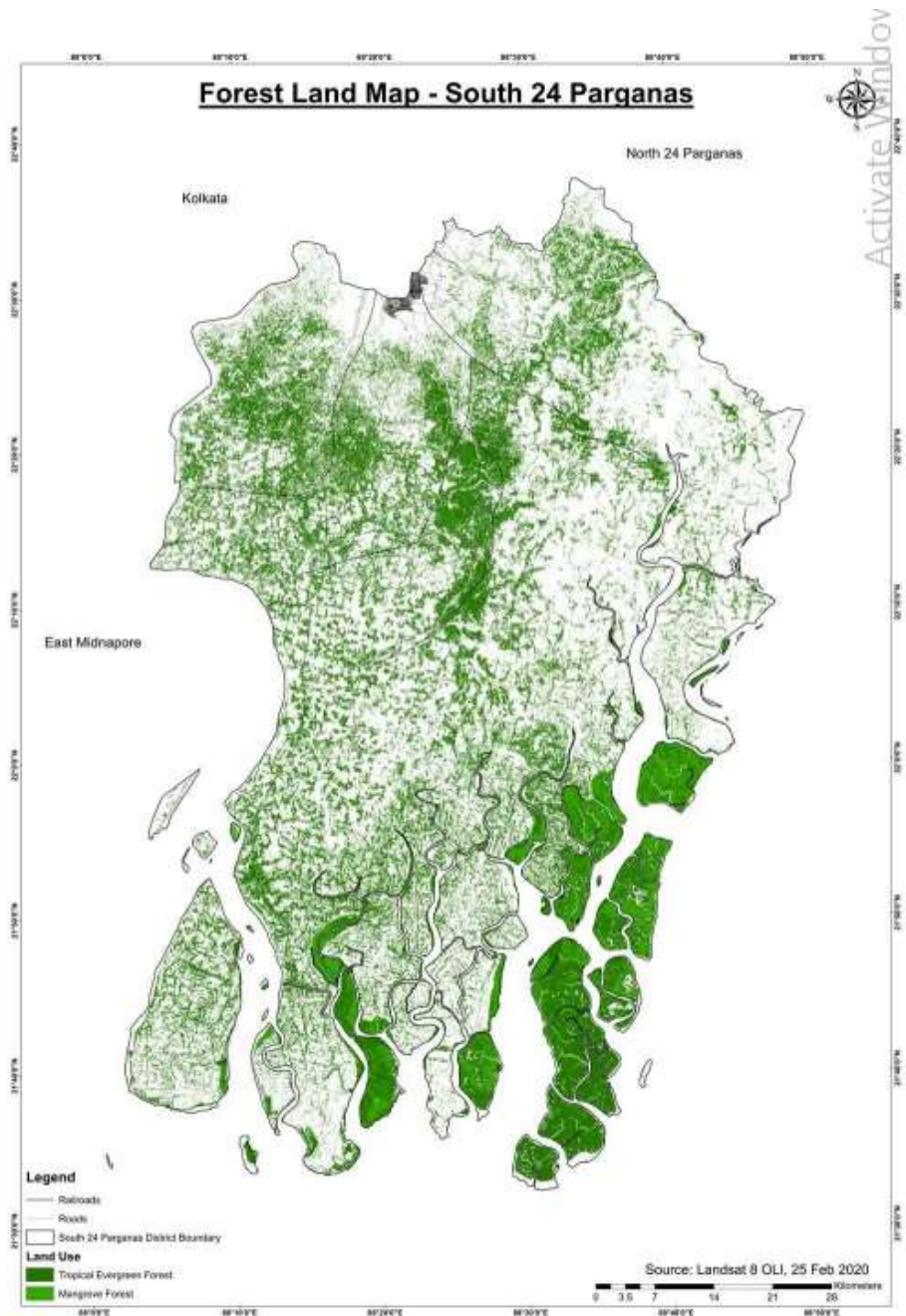


Salt Water Crocodile

Honey Collection

It will not be out of place to say a little about the honey collection of Sundarbans. Around 20,000 kg. of honey is collected every year from forests of Sundarbans. Mostly people from the Kultali, Joynagar, Basanti, Gosaba and Canning areas are engaged in honey collections. The number of honey collectors has dwindled from around 1,500 a few years back to around 700 in 2007. Between 1985-2004, about 75 honey collectors were killed by tigers in the forests. Now all honey collectors are insured for Rs. 50,000. The Forest Department has also intensified vigilance on honey collection period. The Range Officers and Guards are on full alert and therefore no deaths have been reported since 2004.

Source : DISTRICT CENSUS HANDBOOK SOUTH TWENTY FOUR PARGANAS, 2011



2.10 Topography, Physiography and Land use

Topography of the districts is plain, gently sloping and altitude ranges from 1 meter (m) to 14 m above mean sea level (MSL). Being a deltaic district, major physiographic units are: natural levee areas, swamps area and older flood plain. Climate is humid and subtropical, characterized by a hot and dry summer from March to May/June, a south-west monsoon season from June to September, a pleasant post-monsoon from October to November and a cool winter from December to February.

Two distinct physiographic zones are discernible in the terrain presently known as South 24 Parganas. The northern part of the district bordering Kolkata and North 24 Parganas belongs to what is known as the Marine-riverine Delta. In the sub-recent geological period, the sea receded southwards. As a result, a large area as plain land of very low altitude covered with fine clay of variable thickness and subjected to tidal

ingresses got exposed. This required the then existing rivers to extend their courses to meet the receded sea. The recession of the sea face was due to upliftment of the basement complex. To regain their profiles of equilibrium, the earlier river channels started getting exhumed afresh. However, the deepening of the channels proceeded faster along the course of the Padma River, because of higher volume of water flow, than its western distributaries. Land building activity through these fluvial channels further south also dwindled away. This became pronounced in the early decades of the current century. As a consequence, the physiographic zone under discussion continues to experience the joint impacts of fluvial and marine geomorphological processes, since the rate of land building by the rivers declined. All rivers in this zone experience tidal surges. Presently this exposed continental shelf is getting covered by sediments carried by tidal inflows as well as by the rivers. These are forms of sediments brought by the tides and the rivers. The tracts between the river channels continued to contain brackish water wetlands until filled up by sediments arriving through the collapse of the natural levees. Such collapses take place periodically as the channel beds rise due to confined sedimentation. Man-made flood jacketing embankments laid close to the tidal channels also collapse periodically with every reduction of the channel cross section. The inflowing sediments through the collapsed structures fill up the depressions containing the brackish water wetlands. This process is now manifesting with many parts of the Wetland of the North Eastern part of the district of South 24 Parganas. Some parts of this wetland are still preserved to raise fish. But these are gradually changing their brackish nature. Filling up of the inter-fluvial brackish water wetland progressed more extensively in the northern part of this physiographic zone than in the south. The reason is easy to comprehend. Sedimentation from flowing water happens faster with the reduction of water velocity. In the southern part of the District of South 24 Parganas, the Marine Delta zone is formed of inter-lacing tidal channels. The source of sedimentation is the tidal influx, which is scouring the shallow continental shelf.

On the sea face, sand dunes have formed. Under normal circumstance, the sediments get deposited between the inter-lacing river channels. But this condition has been largely altered by human action. To expand agriculture on this newly forming land mass, embankments have been created along the banks of the channels to prevent incursions of saline tidal water. These embankments enclose a tract to permit cultivation of rice with the help of rain water. As a result, features of the geomorphic processes have been altered. In the first instance, sedimentation has been confined within the river channels. This is raising the levels of the river beds, requiring periodic strengthening of the enclosing embankments. Once the embankment collapses, tidal incursions extend into the protected agricultural land and expand the area under sediment accumulation. Until such disasters happen, the agricultural fields lose their nutrients. The accumulated rain water enhances leaching process. When the water is drained out during low tide, loss of nutrients also happens. Rains constitute the major source of potable water. The non-saline aquifers occur at great depth, which is expensive to tap for the generally poor farmers. Shallow tube-wells accelerate the penetration of saline prisms into the so exploited sweet water aquifers. This remains one of the most important reasons behind the backwardness of agriculture of the district. For a vast part of the district, the sources of non-saline water required for irrigation are few and very expensive to tap making agriculture mostly monsoon dependent. Most parts of this zone have been brought under agriculture by destroying the mangrove vegetation. In the south-eastern part of this zone, some of the mangroves have been preserved, which has been declared as a Bio-sphere Reserve and is used for preserving tigers.

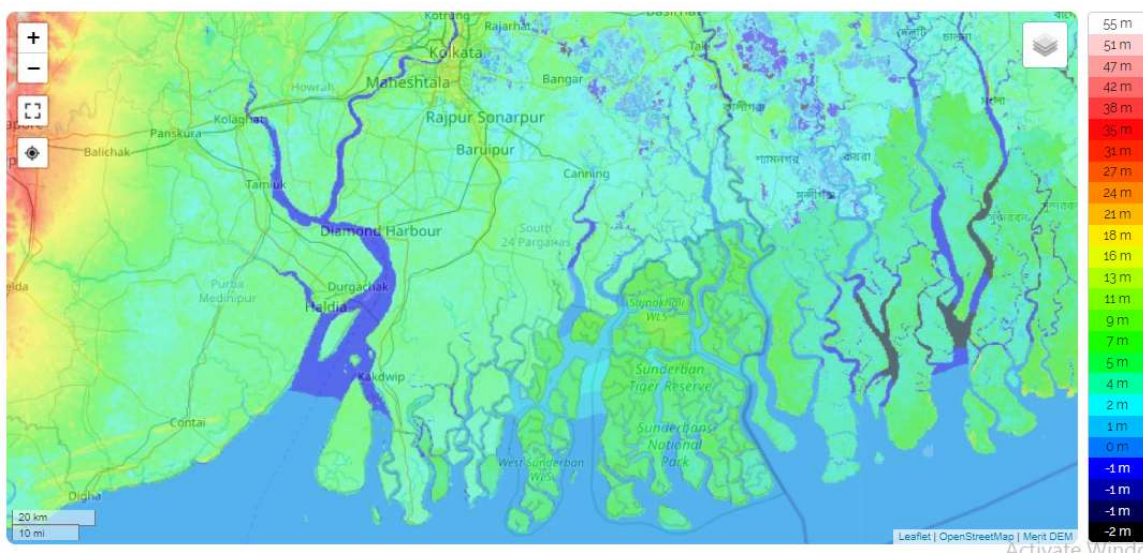
The district of South 24 Parganas can be divided into two distinct agro-ecological zones. The northern part of the district belongs to the hot moist sub-humid agro-ecological

sub region. The soils have been formed from the alluvium deposited by Ganga and its tributaries and sub tributaries. The soils are intensively cultivated for rice, potato and oilseed crops. Frequent inundation of low-lying areas results in stagnation of water for certain times of the year. Besides, flood hazards also affect the normal dry land crop yields. The soils of this sub-region have high nutrient content and mineral resource with a high potential for a large variety of agricultural and horticultural crops. The coastal parts of the districts of South 24 Parganas comprising mostly Sundarban areas belong to moist sub-humid agro-ecological sub-region. The alluvium deposited by the rivers have gradually developed into deep, fine loamy to fine textured soils, by and large salt impregnated due to tidal flow of sea water through creeks and sub-tributaries. These soils are imperfectly to poorly drained with moderate to very high salinity hazards. The soils remain wet and saline for considerable period of the year and are suitable particularly for salt resistant crops.

As per the land utilization statistics (2010-2011) around 44.94 % of the land reported belong to forest, 37.78 % is under cultivation, 15.11% is used for non – agricultural purpose. The scenario of cultivation is as the following:

Sl.	Area	Hectare
a)	Cultivate Area	4,06,215
b)	Area under Forest	1,70,580
c)	Area under Barren and uncultivable land	845
d)	Area under permanent pastures	5,445
e)	Area under Culturable Waste land	2,924
f)	Area under Misc. Tree Crops & Groves	8,427
g)	Fallow land other than current fallows	87
h)	Area under current fallow	13,299
i)	Net Cropped Area	3,93,465
j)	Area under more than one Crop	1,60,217
k)	Area under more than Double Crop	1,890
l)	Gross Cropped Area	5,55,572
m)	Cropping Intensity	141.20%

South 24 Parganas topographic map, elevation, relief Map



Minimum elevation: -1 m

Maximum elevation: 20 m

Average elevation: 3 m

2.11 Industrial Development

Owing to various natural and man-made factors, industrial development in the district is very limited. Due to presence of large tracts of forest lands, numerous rivers, streams, creeks etc., much of the areas is not accessible to industrial development. Small scale household and cottage industries such as jute, handlooms, manufacturing cutlery, pottery, agriculturally based industries, are in the district. There are a small number of large-scale industrial units (dealing in food, chemical, engineering and ship building) in the district. Located in the vast delta with number rivers, streams, creeks etc., land suitable for agriculture is also limited. District comprises area with non-saline soils and with saline (coastal) soils of tidal origin. Non-saline soils are very fertile and rich with nutrient, and are very good for agriculture with abundance of water availability, while the coastal soils are not suitable for agriculture. As per the land use statistics, 38% of the area is under cultivation. Paddy is the main crop, and other include pulses, potato and cash crop Jute. Fishery is an important economic activity in the district. Due to presence of both fresh water and saline water bodies, fresh water and well as saline water fishing is practiced in the district, and a significant number of families depend on this activity for their livelihood.

a. List of the Major Industries in 24 Parganas (South) & nearby Area

Sl.No	Name of the Unit
1	Down Stream Units of HPL (10 Units)
2	Gontermann-Pipers India Ltd.
3	Kohinoor Paper & Newsprint
4	W.B green Energy Dev. Corpn. Ltd.
5	Jute Mills (6 units)
6	K.H.leather Industries, Bantala,24 Pg(S)
7	Mr. Nissat Sakeel & Md. Sakeel, Bantala
8	Paymental Tanniries,bantala

9	S.M enterprises, Bantala
10	Seo sankar Das & B.Ram, Bantala
11	Sip Shing Tannery, Bantala
12	Welcome Leather, Bantala

b. Medium Scale Industries

Sl.No	Name of the Unit
1	NKB Extrusions Pvt. Ltd
2	Anubhab Biotech Pvt. Ltd.
3	Exodus Futura Knit Pvt. Ltd.
4	Bonnie Exports
5	Leader Health Care Pvt. Ltd.
6	Bhawani Poly Pack Pvt. Ltd.
7	LeMartina Bio Genetics Pvt. Ltd.

c. Major Exportable Items

Leather products, Jute Diversified products, Hosiery and Garments, Plastic products, Machinery & Parts.

d. Potential Areas of Service Industry

Baruipur, Falta, Canning, Sonarpur, Garia, Joka, Budge Budge, Diamond Harbour

e. Potential of New MSMEs

MSE units cater a wide range of industries. These include plastic and moulded products, mustard oil, wheat grinding, readymade garments, machine tools, corrugated paper, ball point pen refill, hydraulic equipment, electrical signalling equipment, ceramic tiles, refuelling of industrial gases, detergent powder, fabrication work, chemical equipment & system, ayurvedic medicine and unani medicine, glass products, plastic granules, electrical light fittings, leather goods, leather shoe upper, cotton cloth knitted, thinner, computer stationery, ice block, spice, fibre glass, phenyl, pharmaceutical products, paints liquid soap, lead ingot, coconut shell powder, tamarind seed powder, jute sticks. Apart from these products, there are some items which are 100 percent exported manufactured by SSI units at Falta Special Economic Zone. These items cover base paper, tissue paper, cut paper, cutting tools, garage equipment, builder hardware, zinc base alloy, jute & plastic waste composites, nipple tripped gloves, etc. Export through Falta Economic Zone.

2.12 Mining Activity

There is no Major Mining Activity in the district at present. Production of Major Mining Minerals are insignificant. Minor Minerals like **Silt Brick Earth** is mostly considered as mining activity.

Silt Earth Brick manufacturing process in West Bengal was started in way back 200 years ago during English regime. Way back since 1936, mostly Silt collection ponds are recorded as ‘IT-KHOLA’ on ROR (Right of Record) i.e., in revenue record of W.B Govt. till date.

Presently more than 300 such Brick Manufacturing units are operating in the district but about 83 Nos, are authorised by L&LR Department as on date.

2.13 Climate

The climate of the district is humid and subtropical, characterized by a hot and dry summer from March to May/June, a south-west monsoon season from June to September, a pleasant post-monsoon from October to November and a cool winter from December to February. Majority of the rain is received during the south-west monsoon, from late June to September end. It also receives pre-monsoon torrential rains in summers between March and May. Average annual rainfall of South 24 Parganas district is 1663mm. Maximum and Minimum average temperature registered in the project district is 41°C and 10°C. Relative annual humidity in the district is lies from 71% to 85%.

It may be noted that the skies are moderately clouded in May, heavily clouded in monsoon season and clear or lightly clouded during rest of the year. Winds are generally stronger in Sundarbans and its surroundings. Nor 'westers from March to May and the Bay cyclones during the monsoon ravage the land every year.

Climate change & Sea Level Rise

Global climatic change induced by high concentration of carbon dioxide in the atmosphere that includes warmer climate, melting of glaciers, sea level rise, increase in incidences of tropical cyclonic storms, etc. are issues particularly relevant to Sundarban and other coastal areas of West Bengal. Amongst these, sea-level rise is the greatest threat and challenge for sustainable adaptation within such area. A 45 cm rise in global sea levels would lead to the destruction of 75 percent of the Sundarban mangroves. Along with global sea level rise, there is a continuous natural subsidence in the Sundarban, causing a rise of about 2.2 mm per year. The resulting net rise rate is estimated at 3.1 mm per year at Sagar. The consequences in terms of flooding of low-lying deltas, retreat of shorelines, salinisation and acidification of soils, and changes in the water table raise serious concerns for the well-being of the local population. Additional sources of stress, not related to climate change, include the diversion of upstream freshwater inflow of the Ganges by the Farraka Barrage in India since 1974 to alleviate the rapid siltation in the port of Kolkata. Jointly, the sea level rise and lower freshwater flow in winter will also result in increased salinity in the area, threatening the conservation of the Sundarban mangroves. The issues of climate change, therefore, constitute one of the major challenges of the 21st century and call for an integrated approach to issues of environmental preservation and sustainable development.

CHAPTER - 3

Waste Management Plan

3.1 Solid waste Management

Solid Waste Management may be defined as the discipline associated with the control of generation, collection, storage, transfer and transport, processing and disposal of solid wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics and other environmental considerations.

The most commonly recognized methods for the final disposal of solid wastes are:

Dumping on land

Dumping in water

Ploughing into the soil

Incineration

Municipal Solid Waste

Municipal Solid Waste consists of household wastes, market wastes, construction and demolition debris, sanitation residues, drain silt, waste from streets, etc. With rapid urbanization, rising population and change in lifestyle as well as food habits, the amount of MSW has been increasing rapidly. Moreover, its composition ratio is also changing. Over the last few years, the consumer market has grown rapidly leading to products being packed in cans, aluminium foils, plastics and other such non-biodegradable items that cause incalculable harm to the environment.

The Ministry of Environment, Forest & Climate Change, Govt. of India has notified SWM Rules 2016. As per these rules, the role of local body has been specified in Rule 15 of SWM 2016, and as per Rule 16 of the said Rules the State Pollution Control Board shall enforce these Rules through local bodies in respective jurisdiction.

A. Current status related to Solid Waste Management

In South 24 Parganas District, there are 7 (Seven) ULBs, and 312 Gram Panchayats. The Seven ULBs on an average generates about 510 Metric Tonnes of solid wastes per day. The quantities of waste are also growing with each passing year.

The sanitation campaign "Mission Nirmal Bangla", otherwise known as "Amar Shouchagar", and its unprecedented success has been based on SHACS (Sanitation & Hygiene Advocacy & Communication Strategy) which was jointly developed by the WB State Government and UNICEF.

The scenario of Solid Waste Management of South 24 Parganas is given below:

Urban Local bodies Name of Municipality	No of Wards	No of Households	Population	Solid Waste Generated per day (MT)
Baruipur	17	28125	81964	24.5
Budge-Budge	20	20732	77929	35
Diamond Harbour	16	14121	53676	16.51
Jaynagar-Majilpur	14	9622	37201	13.8
Maheshtala	35	134312	515120	210
Pujali	16	9982	38171	9.55
Rajpur Sonarpur	35	177327	423000	201

Municipalities (Nagar Palika)	Total SW generated (Tonnes Per Day)	Per capita per day solid waste generation (gm/day)	Percent age distribution of dry and wet solid waste	No. of Household	Door-to-door collection of MSW	Collection efficiency for solid waste generated in ULBs (%)	Segregated waste transportation by ULBs	Number of sanitary landfills
Baruipur	17	350	20/80	28125	Yes	95%	Yes	0
Budge-Budge	35	308	40/60	20732	Yes	98.5%	YES	0
Diamond Harbour	16.51	308	40 /60	14121	Yes	70%	Yes	0
Joynagar-Majilpur	13.8	370.95	35/65	9622	Yes	100%	Yes	0
Maheshtala	184	450	18/82	134312	Yes	85%	Yes	2
Pujali	9.55	250	20/80	9982	Yes	13%	Yes	0
Rajpur Sonarpur	201	250	40/60	177327	Yes	63%	Yes	1

Ganga Adjacent Gram Panchayats

1. ODF sustainability maintained at 49 Ganga Adjacent Gram Panchayat.
2. IEC activity done at all Ganga Adjacent Gram Panchayat
3. DPR prepared and approved by SLSSC for Solid Waste Management at 18 Ganga Adjacent Gram Panchayat.
4. Quantity of solid waste generated per HH/ day (in Kg) (av.)- 1 k.g
5. No. of household where segregation is done- 6187 household
6. No. of household where composting is done at household level- 530 household
7. No. of household where bio waste managed by feeding domestic animals- 6129 household
8. Central Processing Unit Constructed -14 Gram Panchayat
9. Central Processing Unit functional - 9 Gram Panchayat
- 10.No. of trained personnel engaged- 22
- 11.No. of vehicles (tri cycle, e-rickshaw etc) deployed- 13
- 12.No. of households wherefrom solid waste is collected at 4 unit- 3947 kg
- 13.Total quantity of biodegradable waste collected at 4 unit- 670 kg
- 14.Total quantity of non-biodegradable waste collected (Kg/ week) at 4-unit -384 kg/week
- 15.Total quantity of compost produced (Kg/ month) at 4 unit- 6450 Kg/month
- 16.Income/ Revenue earned (per month)-Rs52000.00 Per month

Non-Ganga Adjacent Gram Panchayats

1. ODF sustainability maintained at 261 Non-Ganga Adjacent Gram Panchayat.
2. IEC activity done at all Non-Ganga Adjacent Gram Panchayat
3. DPR prepared and approved by SLSSC for Solid Waste Management at 30 Non-Ganga Adjacent Gram Panchayat.
4. Quantity of solid waste generated per HH/ day (in Kg) (av.)- 1 k.g
5. No. of household where segregation is done- 12600 household.
6. No. of household where composting is done at household level- 6300 household.
7. No. of household where bio waste managed by feeding domestic animals- 12277 household.
8. Central Processing Unit Constructed - 30 Gram Panchayat
9. Central Processing Unit functional - 26 Gram Panchayat
- 10.No. of trained personnel engaged- 104
- 11.No. of vehicles (tri cycle, e-rickshaw etc) deployed- 90
- 12.No. of households wherefrom solid waste is collected at 26 unit- 25597 kg
- 13.Total quantity of biodegradable waste collected at 26 unit- 17917 kg/ week
- 14.Total quantity of non-biodegradable waste collected (Kg/ week) at 2-unit -7680 kg/week
- 15.Total quantity of compost produced (Kg/ month) at 26 unit- 15010 Kg/month
16. Income/ Revenue earned (per month)-Rs 1,20,008.00 Per month

B. Identification of Gaps and Action plan for Solid Waste Management

Action points For villages / blocks/ town municipalities / City corporations	Identification of gap	Action Plan	Respo nsible agenci es	Timeline for completi on of action plan
1. Segregation				
Segregation of waste at source	Waste segregation at source is being done by the ULBs but with variable success rates. There are constraints of manpower and infrastructure in some ULBs.	In accordance with the SWM Rules, 2016, to achieve 100% segregation of waste at source in all ULBs more public awareness is needed. SWM infrastructure including collection vehicles, manpower etc. need to be improved.	ULB	Immediate
2. Sweeping				
Manual Sweeping	Manual sweeping is done by majority of the ULCs regularly.	Performance and road coverage need to be improved.	ULB	Continuous
Mechanical Road Sweeping & Collection	Not Achieved in any ULB	Allocation of fund for Mechanical Road Sweeping & Collection system.	ULB/ UDMA	Long Term
3. Waste collection				
100% collection of solid waste	Solid Wastes are being collected by all ULBs with 90-100% success rate.	SWM infrastructure including collection vehicles, manpower etc. need to be increased. EO of ULBs will time to time monitor/review the performance.	ULB	Continuous
Arrangement for door-to-door collection	Being done by all ULBs at present, fully or partially with variable success rate.	Infrastructure for 100% area coverage needs to be created. Collection arrangement, segregation and IEC need to be reviewed by EO regularly.	ULB	Continuous
Waste Collection trolleys with separate compartments	Trolleys and Tricycles with separate compartments are available in some ULBs. There are more requirements and need for maintenance.	Number of waste collection Trolleys with separate compartments need to be increased.	ULB	Continuous
Mini Collection Trucks with separate compartments	Collection Trucks / FOTs operated by authorized agencies are available in all ULBs except Pujali.	More Waste collection trucks with separate compartments need to be introduced in all ULBs as per increasing requirement.	ULB, SUDA	Continuous
Waste Deposition centres (for domestic hazardous wastes)	Maheshtala, Pujali and Baruipur do not have deposition centre.	Need to set up at all localities	ULB	Medium Term
4. Waste transport				
Review existing infrastructure for waste Transport.	Augmentation of Infrastructure required. More battery-operated vehicles, staff training and	Logistic infrastructure to be made sufficient as per requirement. Staff of ULB's to be trained properly for sustainable SWM.	ULB	Medium Term

	better route planning required.	Effective Route planning required for wider area coverage.		
Bulk Waste Trucks	Rajpur Sonarpur has 35 no.s. Not used by other ULBs	The required number of Bulk Waste Trucks needs to be assessed and deployed as per requirement.	ULB	Mid Term
Waste Transfer points	At multiple locations at ULBs except Pujali and Baruipur.	Waste recovery, recycling and other scientific methods of waste management need to be incorporated at Waste Transfer Points.	ULB	Medium Term
5. Waste Treatment and Disposal				
Wet-waste Management: On-site composting by bulk waste generators (Authority may decide on requirement as per Rules)	Total 4 nos of Bulk waste generators are instructed for their wet SH on-site composting at Maheshtala and one Bulk waste generator at Rajpur Sonarpur.	Notice, seminar and IEC will be arranged	ULB/ Bulk waste generator	Immediate
Wet-waste Management: Facility(ies) for central Biomethanation / Composting of wets waste	Composting of wet Waste and Biomethanation partially done by Joynagar Majilpur. Wet waste processed in dumping site on temporary CPU at Diamond Harbour. Vermi composting chambers installed at Maheshtala. Lack of infrastructure or Agency is major constraint.	Functioning of agencies deployed need to be enhanced.	ULBs /SUDA/ WBPC B	Ongoing - Immediate
Dry-Waste Management: Material Recovery for dry-waste fraction	Lack of agencies to collect the different types of segregated dry waste. Agencies deployed by SUDA need to start functioning.	Functioning of agencies deployed need to be enhanced.	ULBs /SUDA/ WBPC B	Immediate
Disposal of inert and non-recyclable wastes: Sanitary Landfill	Not available except Maheshtala	Joynagar Majilpur has plans.	ULB	Mid Term Plan
Remediation of historic / legacy dumpsite	Legacy dump site taken up by KMDA. Cleared at Budge Budge, Joynagar Majilpur, Maheshtala.	Work ongoing/ to be done at Rajpur Sonarpur and Diamond Harbour	SUDA	Immediate
Involvement of NGOs	None	Expert NGOs to be engaged by all ULBs, primary work has been taken up by SUDA	ULB/SUDA	Immediate
EPR of Producers: Linkage with Producers / Brand Owners	Not yet started	Notice, seminar and IEC to be arranged	ULB	Mid Term Plan
Authorization of Waste Pickers	Done at Joynagar Majilpur, Rajpur Sonarpur and Maheshtala	At Planning level in other ULBs	ULB	Ongoing - Immediate
Preparation of own by-laws to comply with SWM Rules 2016	Prepared by Rajpur Sonarpur, Baruipur, Maheshtala, Budgebudge, Joynagar Majilpur and Diamond Harbour.	To be done by Pujali	ULB	Immediate

3.2 Plastic Waste Management

Plastic waste to be managed in accordance with the Plastic Waste Management (Amendment) Rules, 2018 with an emphasis on the 3R principles of Reduce, Reuse and Recycle; ULBs will manage the Plastic Waste generated under their respective jurisdiction while PHE will manage plastic waste in respect of rural areas as per proposal being prepared for engagement of GP wise vendor for Plastic Waste collection.

A. Current status related to Plastic Waste Management

The ULBs on an average generates about 21 Metric Tonnes of Plastic Waste (PW) per day. It has been observed that disposal of plastic waste is a serious concern due to improper collection and segregation system. A very small amount of total plastic waste is effectively recycled; the remaining plastic is sent to landfills etc.

Urban Local bodies (Municipalities)	Estimated quantity of plastic waste per day (MT/day)
Baruipur	3
Budge-Budge	1.26
Diamond Harbour	6
Jainagar-Mazilpore	1
Maheshtala	5
Pujali	0.6
Rajpur Sonarpore	4

B. Identification of gaps and Action plan for Plastic Wastes

Action points for villages / blocks/ town municipalities / City corporations	Identification of gap	Action plan	Agencies responsible	Target time for compliance
Door to Door collection of dry waste including PW	Ongoing Fully or Partially at all ULBs with variable success rate.	100% Door to Door collection of Segregated Waste including PW need to be ensured in all ULBs. Proper segregation of PW and Solid Waste need to be achieved.	ULB	Immediate
Facilitate organized collection of PW at Waste transfer point or Material Recovery Facility	Not Available at ULBs except Rajpur Sonarpur and Maheshtala	To be introduced in all ULBs.	ULB	Immediate
PW collection Centers	Not available except at Maheshtala, Diamond	PW collection Centres to be ensured in all ULBs.	ULB	Immediate

	Harbour and Joynagar Majilpur			
Awareness and education programs implementation	IEC activities on use of plastic taken up so far by ULBs have not yielded desired results.	To Ensure Implementation of PW Management Rules, 2016, will conduct Surprise inspection on the commercial establishments and impose fine for those who store, sell and use the banned plastics. More Public Awareness and participation also to be created in this regard	ULB/WBPC B	Immediate
Access to Plastic Waste Disposal Facilities	Availability only at Rajpur Sonarpur in PPP Model. Not available in other ULBs.	More Plastic Waste Disposal Facilities including Recycling facilities need to be setup.	ULB	Medium Term

3.3 Construction & Demolition (C & D) Waste Management

Construction and demolition waste is generated whenever any construction/ demolition activity takes place, such as, building roads, bridges; fly over, subway, remodelling etc. It consists mostly of inert and non-biodegradable material such as concrete, plaster, metal, wood, plastics etc.

Construction and Demolition Waste Management Rules 2016 provides that every waste generator shall be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated separately, deposit at collection centre so made by the local body or handover it to the authorised processing facilities, ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains.

Waste generators who generate more than 20 tons or more in one day or 300 tons per project in a month shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work, segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar, keep the concerned authorities informed regarding the relevant activities from the planning stage to the implementation stage and this should be on project to project basis.

Waste generators shall pay relevant charges for collection, transaction, processing and disposal as notified by the concerned authorities;

Local Authority shall be responsible for proper management of construction and demolition waste within its jurisdiction including placing appropriate containers for collection of waste, removal at regular intervals, transportation to appropriate sites for processing and disposal.

A. Current status related to C&D Waste

Total C & D waste generation in MT per day (As per data from Municipal Corporations / Municipalities)	Baruipur	Not Available
	Budge-Budge	Not Available
	Diamond Harbour	Not Available
	Joynagar-Majilpur	Not Available
	Maheshtala	1.933 MT/day
	Pujali	Not Available
	Rajpur Sonarpore	Not Available
Does the District have access to C&D waste recycling facility?		No

B. Identification of Action points and plan for C&D Waste Management

Action points For Town Municipalities	Action plan	Agencies responsible	Target time for compliance
Inventory of C&D waste generation	<ol style="list-style-type: none"> 1. Survey of the C & D generators under the jurisdiction of ULB. 2. Identify regular bulk waste generators (Contractors or Builders) 3. Distribution of Staffs in Collecting , Transporting and Processing of C & D 	ULB	Mid Term
Implement scheme for permitting bulk waste generators	<p>Contractors/Builders should have registration id in the ULBs to collect & transfer the C & D Wastes to the C & D Deposition Center for treatment.</p> <p>The generators should be charged as per by law.</p>	C & D Wastes generators /Contractors/ Builders ULB	Mid term
Establishment of C&D Waste Deposition centers	<ol style="list-style-type: none"> 1. Identify and allocation of land for deposition center 2. Construction and fencing of deposition center. 3. Identify the transportation point. 	<ol style="list-style-type: none"> 1. ULB 2. NGOs 	Long Term
Implementation of By-Laws for C & D Waste Management	Publish notification for registration of C & D Waste generators, generator charge, transportation cost, selling price, etc. By-Laws.	ULB staffs	Mid Term

Establishment of C&D Waste recycling plant or linkage with such facility	1. Involve NGOs or to startups to establish a C&D Waste recycling plant, 2. Any ULB initiative (if possible)	NGOs, Startup, ULB	Long Term
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3.4 Bio-Medical Waste Management

Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps.

Bio Medical waste includes all the waste generated from the Health Care Facility which can have any adverse effect to the health of a person or to the environment in general if not disposed properly. All such waste which can adversely harm the environment or health of a person is considered as infectious and such waste has to be managed as per BMWM Rules, 2016.

Salient Features of the BMW Rules:

All health care establishments (HCEs) generating and handling BMWs are required to obtain Authorization from the WBPCB. The authorization is one time for non-bedded occupiers.

In addition to obtaining authorization, all HCEs coming under the purview of the rules are required to submit [Annual Returns](#) on bio-medical waste generation and disposal to the State Board within 30th June every year as per Form IV of the Bio-medical Waste Management Rules, 2016.

As per the provision of the rules it is mandatory for all HCEs to treat BMWs generated by them either on their own or through some authorized Common BMW Treatment Facility (CBWTF).

How to segregate waste in Non-Chlorinated Bags

Colour of the Bags	Types of BMWs
Red	Disposable contaminated waste which can be recyclable – will be disposed by autoclaving treatment followed by shredding, Tubing, Bottles, Intravenous tubes and sets, Catheters, Urine bags, Syringes (without needles and fixed needle syringes), Vacutainers with their needles cut and gloves
Yellow	Human anatomical wastes, Body parts / tissues etc., Cotton dressings, Plaster, Casts, Gauze pieces, Antibiotics and other drugs, Microbiology waste, Culture devices, Stocks or specimen, Microorganisms, Discarded linens, mattresses, dressings soiled with blood or body fluids, routine masks and gown
Blue	Glassware – broken, Contaminated glass, Medicine Vials, Ampoules etc. (Puncture proof or leak proof Container)

White	White (Translucent) – Waste sharps including metals – packed in puncture proof containers, Needles, Syringes with fixed needles, Scalpels, Blades, Lancet, Suture needle, Aluminum foil, Any contaminated sharp object causing puncture/cuts, Handed over to Waste Agency, when 2/3 full (Puncture Proof Container)
Chemical/Liquid Waste	Liquid waste: To be treated with 1 to 2 % Hypochlorite or to have an ETP, Floor washing etc. should be pre-treated onsite using 1 - 2% Sodium Hypochlorite or connected to ETP

A. Current status related to Bio-Medical Waste

There are more than 500 No. of bedded healthcare facilities including Government and Private Nursing Homes in the district and more than 250 Nos of Clinical Lab/Diagnostic Centres in the district which produces about 711.5 MT Bio Medical Waste annually.

Health District Name	Annual generation of BMW (kg/annum)	Annual generation of BMW in Government bedded HCUs (kg/annum)	Annual generation of BMW in Private bedded HCUs (kg/annum)	Annual generation of BMW in Non-bedded HCUs (kg/annum)
Diamond Harbour Health District	29,400	14,400	15,000	NA
South 24 Parganas Health District	6,82,000	2,52,000	4,30,000	NA

Total no. of Bedded Healthcare Facilities			Non-bedded HCUs (Pathological lab & Diagnostic Centres)
Health District Name	Govt.	Pvt.	
Diamond Harbour Health District	33	115	98
South 24 Parganas Health District	32	329	153

B. Identification of Action points and plan for Bio-Medical Waste Management:

Action points For Town Municipalities	Action plan	Agencies responsible	Target time for complianc
Collection, Segregation & Treatment of solid waste	Biomedical Waste to be managed in accordance with the Bio Medical Waste Management Rules,2016. Tagging all the healthcare facilities with the concerned Municipalities/ Gram Panchayats for collecting the segregated solid waste and treating it.	HCF CMOH Pvt. Disposal Agencies Local Administration	On-going
Preparation of 'Inventory of Biomedical Waste Generation'	Procurement of different colour coded; paddle operated covered bins. Provision of BMW Common collection site.	WBPCB CMOH Concerned Health Care Facilities	On-going
Capacity building/training of HCFs	DQAU impart training to HCUs on yearly basis at CMOH Office/at facility level. Training related to Infection Control and BMW management will be provided to all category of staffs including medical officers, Nursing staffs, Lab Tech, Pharmacist, GDA, Scavengers	Trainer from BMW Treatment/ Facility and facility Infection Control Nurse/ DQAU	On-going
Authorization of HCFs	HCFs apply to WBPCB for authorisation and CE license is granted/renewed on production of valid authorisation from WBPCB	WBPCB/ CMOH	On-going

Biomedical Waste Treatment and Disposal Facilities (CBMWTFs)	<p>There are about 13 CBMWTFs in the State and Greentech Environ Management Pvt. Ltd. located at Mograhat, Dist.- 24 Parganas (S) is the major facility availed by the HCFs of the district.</p> <p>Tagging of all healthcare facilities with a Biomedical Waste Treatment and Disposal Facility (BMWTF), so that proper treatment of BMW can be done. Also, the BMWTF should collect waste from the facility on regular basis.</p>	WBPCB/CMOH	On-going
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3.5 Hazardous Waste Management

“Hazardous waste” means any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances.

A. Current status related to Hazardous Waste

Details of Data Requirement		Present Status
	No. of Industries generating HW	66
Quantity of HW in the district	Quantity of incinerable (MT/annum)	158.654
	quantity of land-fillable (MT/annum)	762.07
	quantity of recyclable/utilizable (MT/annum)	Recyclable: 68.95 Utilizable: 0
	Quantity of Total hazardous waste generated (MT/Annum)	5447.084
	No. of captive/common TSDF	NA
	Contaminated Sites or probable contaminated sites	NA

B. Identification of Action points and plan for Hazardous Waste Management

Action points For Town Municipalities	Action plan	Agencies responsible	Target time for compliance
Preparation of 'Inventory of Hazardous Waste Generators'	Including Manufacturer /recycler/ refurbisher /handler of Lead Acid battery, and other lead scrap/ashes/residues not covered under Batteries (Management and Handling) Rules, 2001.	ULB/ GM, DIC/ WBPCB	On-going process
Awareness/training of Waste Generators	ULBs take necessary steps for public awareness and importance of segregation of potentially hazardous domestic waste. Training on Handling/disposal will be provided to informal sector persons who are engaged in trading, dismantling, and recycling of e- waste/batteries.	ULB/ GM, DIC/ Industries	On-going process
Regulation of industries and facilities generating Hazardous Waste	It is an ongoing process.	WBPCB MOEF CPCB	On-going process
Waste deposition centres for domestic hazardous waste	Collection takes place from individual source by respective agencies. ULBs need to establish waste deposition centres for domestic hazardous waste and give direction for waste generators to deposit domestic hazardous wastes at this centre for its safe disposal.	ULBs	Mid Term
Monitoring of Compliance	District Level Monitoring Committee to monitor the compliance of the provisions of Hazardous waste Management Rules	DLMC	On-going process

3.6 E-Waste Management

Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for refurbishment, reuse, resale, salvage recycling through material recovery, or disposal are also considered e-waste

A. Current status related to E- Waste:

At present E-waste management is in nascent stage in the district and only informal trading, dismantling, and recycling of e-waste exists in the district takes place. However, the amount of E-waste is increasing significantly the district need to have a proper plan for E-waste Management.

B. Identification of Action points and plan for E- Waste Management:

Action points For Town	Action plan	Agencies responsible	Target time for compliance
Collection of E-Waste	<ul style="list-style-type: none"> Collection Centers to be established by ULBs Door to door collection Authorizing E-Waste collectors 	ULB	Mid Term - Long Term
Control E-Waste related pollution and Awareness	Creation of Awareness on E- Waste handling and disposal	District Administration, GM DIC ULB	Mid Term

List of authorised Refurbisher/Dismantler/Recycler of e-wastes of South 24 Parganas District (

Sl No	Name & address of the Unit Permitted	Capacity	Validity
1	M/s. Lubrina Recycling Pvt. Ltd. Vill – Joychandipur, P.O. – Bakhrat, P.S. – Bishnupur, Dist. – 24 Parganas (S), Pin – 743377 Mr. Asish Lohiya Mob. No.9831151692	Quantity permitted 1080 MT per annum	valid for a period up to 31/05/2026.
2	M/s. OLD N FURNITURE 323, K.P. Mondal Road, P.O. & P.S.: BudgeBudge, Dist : 24 Pgs(S), Pin: 700137. Mob. No. 9433747759/988333111	Quantity permitted 180 MT per annum	valid for a period up to 30/09/2024

CHAPTER - 4

Water Quality Management Plan

A. Current status related to Water Quality Management

Rivers (Name and length of each river in Km)	Hugli, Matla, Bidyadhari, Raimangal, Saptamukhi rivers with their tributaries/distributaries from the main drainage in this district.
Length of Coastline (if any)	NA
Nalas/ Drains/Creeks meeting Rivers	NA
Lakes / Ponds (No and Area in Ha)	NA
Total Quantity of sewage from towns and cities in District	NA
Quantity of industrial wastewater	NA
Percentage of untreated sewage	NA
Details of bore wells and number of permissions given for extraction of groundwater	No. of registration issued for bore wells= 51 No. Of permit issued for bore wells = 543
Groundwater polluted areas if any	<u>Arsenic affected Blocks (10 nos.):</u> BARUIPUR, Bhangore I, II, Bishnupur I, II, Sonarpur, Budge Budge II, Jaynagar I, Basanti, Magrahat II (As per Annual Report 2014-2015, SWID, WRIDD). The maximum value of Arsenic content was recorded to be 3.2 ppm at Baruipur (as per the report on National Aquifer Mapping & Management Plan, CGWB) <u>Salinity Affected blocks: (all 29 Blocks)</u> (As per Annual Report 2014-2015, SWID, WRIDD)
Polluted river stretches if any (Km)	Hoogly River up to Diamond Harbour

Station on Basin- Ganga	Water Body	Human Activities	Frequency Of Monitoring	CP CB Station Code	Date of Sampling	Color & Intensity	Odour:	Visible effluent discharge
AMTOLA ON DIAMOND HARBOUR ROAD, 24 PARGANAS (S)	null	Drinking & Domestic	Half yearly	2547	10/04/2023	Clear	Odour free	None

GANGA AT DIAMOND HARBOUR, WEST BENGAL	Ganga	Navigation	Quarterly	1469	24/08/2023	Muddy	Odourless	None
RESIDENTIAL AREA AT SONARPUR	Ground Water at Sonarpur	Drinking & Domestic	Half yearly	1936	13/04/2023	Clear	Odour free	None
Ground water at Shyampur, Budge Budge	Well	Drinking & Domestic	Half yearly	4737	11/04/2023	Clear	Odour free	None

B. Identification of Action points and plan for Water Quality Management:

Action points For Town	Action plan	Agencies responsible	Target time for compliance
Inventory of water resources in District	Inventory of water resources in District covering Rivers and other natural water bodies, Nalas/ Drains meeting Rivers Lakes / Ponds, etc Total Quantity of sewage and industrial discharge are also to be assessed.	ULBs, UDMA, WRRID, WBPCB, Public Health Engineering Department (PHED), Central Groundwater Board (CGWB), Irrigation and Waterways Department (IWD), District Administration, UD&MA, P&RDD	Immediate
Collection of Water Quality Data	The Chemical Laboratories of the SWID under WRIDD are doing chemical testing of water samples which are collected from the P.H.S of the department twice in a year for the ground water quality assessment (Pre monsoon and Post monsoon). Pollution Control Board is also collecting periodic water quality data from designated locations.	WBPCB, SWID	Mid to Long Term

Control of Groundwater Water Quality	The tube wells withdrawing groundwater for drinking purposes, should be frequently tested for Arsenic Rainwater harvesting to be promoted. Modern agricultural management and irrigation practices should be adopted to reduce withdrawal of ground water	SWID, Agriculture and PHE Deptt., ULBs, GPs	Immediate
Control of River side Activities	River side activities like River Side open defecation, Dumping of SW on river banks, Idol immersion etc. to be controlled	Dist. Admin PHE, BDOs ULBs	Immediate
Awareness Activities	District and Block level campaigns on protection of water quality and Control of Water Pollution in Rivers.	PHE, BDOs	Immediate
Protection of Flood plains	Encroachment of flood plains to be regulated.	Dist. Admin, Irrigation L&LR Department.	Immediate
Rainwater Harvesting	A separate Action plan for Rain water harvesting in line with Govt policy need be prepared.	Agri-Irrigation	Mid Term
Complaint redressal system	Complaints redressal system in District is already functioning	District Administration, WBPCB	Continuous

CHAPTER - 5

Domestic Sewage Management Plan

Domestic Sewage includes all wastewater generated by home dwellings, public restrooms, hotels, restaurants, motels, resorts, schools, places of worship, sports stadiums, hospitals and other health centres, apartments and the like. They all produce high volumes of wastewater.

A. Current status related to Domestic Sewage Management:

No of Class-II towns and above	NA
No of Class-I towns and above	NA
No of Towns STPs installed	1
No of Towns needing STPs	6
No of ULBs having partial underground sewerage network	Budge Budge Municipality (16 out of 20 Wards)
No of towns not having sewerage network	NA
Total Quantity of Sewage generated in District from Class II cities and above (MLD)	NA
Quantity of treated sewage flowing into Rivers (directly or indirectly)	Data not available
Quantity of untreated or partially treated sewage (directly or indirectly)	Data not available
Quantity of sewage flowing into lakes	Data not available
Total available Treatment Capacity	9.30 MLD Budge Budge Municipality

B. Identification of Action points and plan for Domestic Sewage Management:

Action points	Gaps and action plan	Responsible agency	Timeline for completion of action plan
Inventory of Sewage Management	To assess sources of generation of wastewater and quantity of wastewater production in urban areas	UDMA/WBPC B/ PHE/ULBs	Short Term to Mid Term
Sewage Treatment Plants (STPs)	Existing STPs maintained by KMDA to be upgraded/augmented.	UDMA/ KMDA	Short Term
Underground sewerage network	To be planned.	UDMA/ ULBs	Long Term

CHAPTER - 6

Industrial Waste Water Management Plan

A. Current status related to Industrial Waste Water Management:

Number of Red, Orange, Green and White industries in the district	Red- 13, Orange- 43, Green- 03, Healthcare-89
No of Industries discharging wastewater	500
Total Quantity of industrial wastewater generated (MLD)	2000
Quantity of treated industrial wastewater discharged into Nalas / Rivers	2000
Common Effluent Treatment Facilities	None installed yet
No of Industries meeting Standards	Figure varies because of waste water sampling analysis report
No of Industries not meeting discharge Standards	Figure varies because of waste water sampling analysis report

B. Identification of Action points and plan for Industrial Waste Water Management:

Action points	Gaps and action plan	Responsible agency	Timeline for completion of action plan
Compliance to discharge norms by Industries	Stringent action against the identified industries not meeting discharge standards and in operation without Consent. To assess the existing centralized and decentralized plants of wastewater treatment especially the Sewage Treatment Plants (STPs), Effluent Treatment Plants (ETPs) & Common Effluent Treatment Plants (CETPs) and take appropriate measures for upgradation or expansion. To identify bulk users of water like Industrial Clusters, Metro rail, Indian Railways, Infrastructure Projects, Construction Sectors, etc.	WBPCB, DEPT OF ICE, MSME	Short-term to medium-term
Complaint redressal system	Complaint redressal to be strengthened and frequency of inspection by enforcing authorities to be increased.	WBPCB/GM DIC	Immediate

CHAPTER - 7

Air Quality Management Plan

A. Current status related to Air Quality Management

Details of data requirement	Present status	
Number of Automatic Air Quality monitoring stations in the district.	Operated by SPCB / State Govt / Central govt./ PSU agency	8
	Operated by Industry:	0
Number of manual monitoring stations operated by SPCBs	Baruipur	1
	Amtala	1
Name of towns / cities which are failing to comply with national ambient air quality stations	NA	
No of air pollution industries	Large Industries: Thermal Power Plants Small industries: Plywood, Dyeing & Bleaching, Food industries	
Prominent air polluting sources (Large Industry / Small Industry/ Diesel and Petrol engine/ Vehicles, Thermal Power plants)	1. Industries with major emission potential: <ul style="list-style-type: none"> • Thermal Power Plant: CESC LTD, Budge Budge • Food Industries: IFB Agro Industries Ltd, Noorpur • Plywood industries • Dyeing & bleaching industries 2. Vehicular pollution 3. Other potential emission sources like: <ul style="list-style-type: none"> • Brick Fields • Fugitive emission from Construction sector • Garbage & Leaf burning • Stubble Burning 	

B. Identification of Action points and plan for Air Quality Management

S. No.	Action points	Indicative Action Plan	Responsible agency	Timeline for completion of action plan
1.	Identification of prominent air polluting sources?	8 no. Automatic and 2 no. Manual Air Quality monitoring stations of SPCBs /CPCB are periodically monitoring Air quality.	District Authorities/West Bengal Pollution Control Board (WBPCB)	6 months
2.	Ambient Air quality data.	This data can be easily accessible in https://www.wbpcb.gov.in/ or http://emis.wbpcb.gov.in/airquality/citizenreport.do link.	WBPCB/CPCB	Continuous
3.	Setting up of Continuous Ambient Air Quality Monitoring Stations	Ambient Air Quality Monitoring Station (AAQMS) in South 24 Parganas District - 8 no. Automatic and 2 no. Manual Air Quality monitoring stations Use air quality sensors/ earth-observation based monitoring at probable hotspots to complement air-quality monitoring (based on CPCB/ Mo EF&CC guidelines) may also be explored.	District Authorities/ /WBPCB)/CPCB	Ongoing
4.	District level Action Plan for Air Pollution	To control Air Pollution, the district has already started promoting Public Transport systems, E-mobility, LPG based cooking, carpeting of open areas. Control of emission from Thermal Power Plant, Dyeing & Bleaching Industry shall be done. Emission from Brick fields shall also be monitored. Garbage burning and indiscriminate stubble burning should be prohibited. Emission from construction sector shall be controlled.	District Administration Authorities/Regional Transport Office (RTO)/ District Forest Office (DFO), WBPCB, ULBs, Police Authorities	Immediate

5.	<p>Monitoring of compliance by Industries / Brick Kilns</p> <p>Monitoring of Polluting Vehicles & Promotion of clean Energy</p> <p>Hotspots of Air Pollution (other sources)</p>	<p>Industrial emission: Strengthen and implement strategies needed for critically polluted industrial areas. Implement existing standards for PM and ensure compliance through regular testing and Inspection Identify the units that need to install Continuous Emission Monitoring System /Br (CEMS) across all targeted and applicable polluting industry: Ensure calibration and working of CEMS in all industries in the urban airshed or area of influence and provide information to monitoring agencies to take appropriate actions.</p> <p>Brick fields: Emission from Brick fields shall also be monitored.</p> <p>Vehicular emission: Stress will be given for setting up more Auto Emission Testing Centres in the ot district in addition to the existing centres. RTO will ensure that all Auto Emission Testing Centres functions as per Govt norms.</p> <p>Promotion of Clean fuels: To control Air Pollution, the district has already started promoting Public Transport systems, E-mobility, use of LPG as cleaner fuel alternative.</p> <p>Garbage burning and indiscriminate stubble burning should be prohibited. Emission from construction sector shall also be reduced.</p>	<p>District Authority/ Urban Local bodies (ULBs)/ Police Authority/ Agriculture Department/Regional Transport Office (RTO) /West Bengal Pollution Control Board (WBPCB)/ District Industrial Centre (DIC)</p>	<p>Immediate</p>
6.	<p>Awareness on Air Quality</p>	<p>Public awareness to be created through IEC Campaign with participation of Self-Help Groups (SHGs), Non-Governmental Organizations (NGO), Students, Media etc.</p> <p>Mobile App and Online Portal has been developed by WBPCB.</p> <p>Dissemination of information on local air quality in towns located in District is already done.</p>	<p>District Authority/General Managers District Industrial Centers (GMDIC)/ WBPCB/ NGOs/ Gram Panchayat (GP)</p>	<p>Immediate/ Ongoing</p>

CHAPTER - 8

Mining Activity Management Plan

A. Current status related to Mining

Type of Mining Activity	Major Minerals - Nil Minor Minerals - Silt Brick Earth
No. of licensed Mining operations in the district	Sand / Other Major Minerals- Nil Silt Brick Earth - 83 Brickfields
% Area covered under mining in the district	NA
Area of Sand Mining (sq Km)	NA
Area of sand Mining (River bed/estuary/non river deposit)	NA

B. Identification of Action points and plan for Mining Activities

Action points	Gaps and action plan	Responsible agency	Timeline for completion of action plan
Monitoring of Mining activity	Brick Klins need to be monitored for Environmental Pollution and illegal extraction of earth.	WBPCB L&LR Department	Continuous
Inventory of illegal mining if any mining	Need stringent monitoring: Ban illegal mining. Take stringent action against brick kilns located near the urban areas.	WBPCB, District Administration, District Police Administration	Short-term to medium-term action (6 months to 1 year)
Environment compliance by Mining industry	Brick Klins need to obtain clearance from WBPCB & L&LR Department	WBPCB L&LR Department	Continuous

CHAPTER - 9

Noise Pollution Management Plan

Noise can be defined as unwanted or undesired sound and Noise pollution simply means when there is a lot of noise in the environment which is consequentially harming the environment. Noise pollution affects both human health and behaviour. Noise pollution also impacts the health and well-being of wildlife. Most activities that cause pollution are essential to meet the needs of the growing population and development. Therefore, preventive measures to minimize pollutants are more practical than their elimination.

A. Current status related to Noise Pollution Management

No. of noise measuring devices available with various agencies in district	Data Not Available
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B. Identification of Action points and plan for Noise Pollution Management:

Action points	Gaps and action plan	Responsible agency	Timeline for completion of action plan
Availability of Sound/Noise Level Meters.	PCB or its authorized Agency will conduct Noise level Monitoring Mitigate data gap: -identified areas (panchayat & municipal areas) to collect and share data on asked questions with utmost priority	WBPCB, ULBs, GPs	Short-term to medium-term action
Ambient Noise Level monitoring .	Capacity to monitor noise levels: -Install noise pollution monitoring systems based on land use as suggested in the Noise Pollution (Regulation and Control Rules 2000)	WBPCB, ULBs, GPs	Short-term to medium-term action (6 months to 1 year)
Signboards in Noise zones	Identify silence zones Categorisation of areas into industrial, commercial residential or silence areas/zones	WBPCB, ULBs, GPs	Short-term to medium-term action

			(6 months to 1 year)
Monitoring of polluting vehicle	RTO and WBPCB will take steps for monitoring/ checking of vehicles to ensure environmental norms are followed by the vehicles.	RTO/WBPCB	Continuous
Restriction on use of loud speakers/ PA system etc and monitoring	Loud speaker or a public address system is allowed to be used without obtaining written permission from the authority. A loud speaker or a public address system is not allowed to be used at night (between 10.00 p.m. to 6.00 a.m.) Special team for monitoring during festivals.	District Administration /SDO	Continuous
Complaint redressing system	Compliance to ambient noise:- Increase frequency of implementation of ambient noise standards	District Administration, District Police Administration, Traffic police and transport Department	Short-term to medium-term

CHAPTER - 10

Sundarban Mangroves Management Plan

A. Current status related to Sundarban Mangrovs:

Total area of Sundarban Biosphere Reserve -	9600 sq.km.
Forest area of Sundarbans India	4260 sq.km (approx.)
Endangered, Threatened and extinct species	<p>Bengal tiger, estuarine crocodile, northern river terrapin , olive ridley sea turtle, Gangetic dolphin, Irrawaddy dolphin, Hump back dolphin, ground turtles, hawksbill sea turtles and different types reptiles, insects, Water birds Mollusks etc.</p> <p>Hog deer (Axis porcinus), water buffalos (Bubalus bubalis), barasingha or swamp deer (Cervus duvauceli), Javan rhinoceros (Rhinoceros sondaicus), and the mugger crocodile (<i>Crocodylus palustris</i>)</p> <p>Mangrove species – IUCN categorised 11 no of mangrove species as Rare, Endangered & Threatened. Such as Sundari (Heritiera spp.), Intsia bijuga, Cynometra iripa etc</p>
Importance of Mangrove Forests	<p>Mangrove forests of the Sunderbans provide a lot of protection from natural calamities. It acts as bio-shield or natural defence against disaster.</p> <p>Acts as a carbon sink as mangrove ecosystem absorbs more carbon than the other land-based forests.</p> <p>This provides breeding grounds for fisheries and suitable habitat for enriched biodiversity.</p> <p>Unique Flora and Fauna of the area.</p>
Threats to Mangrove Forests	<p>Frequent Cyclones and Climate change, Sea level rise, increasing salinity, biotic pressure are some of the major threats to mangroves. Recently huge number of mangroves damaged by the catastrophic effect of super cyclone likes Amphan Bulbul, YAAS etc.</p> <p>Increasing Anthropogenic pressure.</p>

B. Identification of Action points and plan for Sundarban

Mangroves Management:

Action points	Gaps and action plan	Responsible agency	Timeline for completion of action plan
Plantation of Mangrove and associated species.	The proposal of 335 ha mangrove plantation is submitted under MISHTI scheme in forest land for Raising of community mangrove nursery and Plantation of Mangroves with its associated species.	Forest Deptt.	Short Term
Major Species selected for Plantation	<ul style="list-style-type: none"> • KHALSI <i>Aegiceros corniculata</i> • KALO BAINI <i>Avicenia alba</i> • PEYARA BAINI <i>Avicennia marina</i> KANKRA <i>Bruguiera gymnorrhiza</i> • JHAMTI GORAN <i>Ceriops decandra</i> • BOKUL KANKRA <i>Bruguiera parviflora</i> • MOTH GORAN <i>Ceriops tagal</i> • KEORA <i>Sonneratia sp.</i> • SUNDARI- <i>Heritiera fomes etc.</i> 	Forest Dept /SDB/ Panchayat	Short Term
Restoration of mangrove ecosystem.	<p>The aim is to support alternative livelihood without destroying the mangrove forest. Restricted number of tourists in peak seasons will reduce pressure on ecosystem. Illegal Fisheries and other activities causing damage to mangroves need to be strictly stopped.</p> <p>All development activities need to be strictly in accordance with CRZ notifications and other regulations applicable.</p> <p>Protection & Conservation of existing mangrove forests.</p>	Forest Deptt /Fisheries Deptt /PDDRDC /MGNREG A /SCZMA	Short Term
Control of Pollution	<p>Plastic Wastes generated by Tourists and local residents need to be controlled</p> <p>Oil spill from boats/vessels need to be checked regularly</p> <p>Massive awareness generation</p>	Forest Deptt/ WBPCB/ RTO	Immediate

CHAPTER - 11

Wetlands Management Plan

Wetlands are dynamic areas, open to influence from natural and human factors. In order to maintain their biological diversity and productivity and to allow wise use of their resources by human beings, some kind of overall agreement is needed between the various owners, occupiers and interested parties. The management planning process provides this overall agreement. In other words, the management plan provides the basis for maintaining the ecological character of a wetland and to allow wise use of the resources by the owner and/or agreed users.

A. Current status related to Wetlands Management:

Major Wetlands	<ol style="list-style-type: none"> 1. East Kolkata Wetlands (Ramsar site) 2. Sundarban Wetland (Ramsar Site) 3. Other Wetlands
Management Authority	<ol style="list-style-type: none"> a. East Kolkata Wetland Management Authority (EWMA) for East Kolkata Wetlands b. District Administration for other wetlands
Status of Wetland Management Plan	<ol style="list-style-type: none"> a. East Kolkata Wetlands Management Action Plan 2021-26 has been prepared by the Department of Environment, Government of West Bengal in 2021 b. District Level Wetlands Management Plan is integrated under District Environment Plan.

B. Identification of Action Points and plan for Wetlands Management

Action points	Action plan	Agencies responsible	Target time for
Preparation of Integrated Inventory of wetlands, Notification, data collection and mapping of Wetlands	<p>Major wetlands in the district have been identified and proposal has been sent to EKWMA (Nodal Body) for notification under Wetlands (Conservation and Management) Rules, 2017</p> <p>Data about land use patterns, biodiversity, ecosystem, nutrient levels, major pollutants etc. for each wetland need to be collected in more details. Delineating wetlands, wetlands complexes and zone of influence, preparation and publication of Maps for administrative and public use.</p>	<p>Dist. Admin BDOs, ULBs, WRIDD, L&LR Deptt., Fisheries and Agriculture Deptt. Forest Deptt.</p>	<p>Immediate/ Ongoing</p>

<p>Creating Public Awareness and community participation in wetlands management</p>	<p>Communication, Education, Participation and Public Awareness through signage at major points, webpage, establishment of community advisory group, resource material and workshop and public events, etc.</p>	<p>Dist. Admin BDOs , ULBs, Fisheries deptt. Forest Deptt. DICO</p>	<p>Immediate</p>
<p>Strict Action against illegal encroachment, restricted activities and transformation of land use</p>	<p>Land use and land cover of the wetland to be maintained in line with regulatory requirements under Wetlands (Conservation and Management) Rules, 2017 and Acts in force.</p> <p>The following activities shall be prohibited within the wetlands, namely, -</p> <ul style="list-style-type: none"> (i) conversion for non-wetland uses including encroachment of any kind; (ii) setting up of any industry and expansion of existing industries; (iii) manufacture or handling or storage or disposal of construction and demolition waste covered under the Construction and Demolition Waste Management Rules, 2016; hazardous substances covered under the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 or the Rules for Manufacture, Use, Import, Export and Storage of Hazardous Micro-organisms Genetically engineered organisms or cells, 1989 or the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008; electronic waste covered under the E-Waste (Management) Rules, 2016; (iv) solid waste dumping; (v) discharge of untreated wastes and effluents from industries, cities, towns, villages and other human settlements; (vi) any construction of a permanent nature except for boat jetties within fifty meters from the mean high flood level observed in the past ten years calculated from the date of commencement of these rules; and, (vii) poaching. <p>Strict legal action initiated by local administration, line departments and law enforcement agencies against any encroachment of wetland area and illegal activities. Monitoring of complaints is actively being done by District and Block level taskforces.</p>	<p>Police Authorities, L&LR Deptt., WBPCB, Dist. Admin, Fisheries Deptt. Forest Deptt. BDOs , ULBs</p>	<p>Immediate/ Ongoing</p>

Assessment and Monitoring System to be put in place and used.	Continuous monitoring of wetlands through community involvement and development of functional surveillance system. Preparation of Health Card for individual wetlands and periodic review.	Dist. Admin WBPCB, BDOs , ULBs	Mid term
Water and Waste Management and Pollution Abatement	Sewage quantity and quality received within the wetland to be efficiently treated applying traditional waste recovery practices. Local action for addressing issues like solid waste dumping, degradation due to anthropogenic activities etc. Other methods of pollution abatement like waste water treatment facility , Canals etc.to be explored as per requirement.	Dist. Admin WBPCB, PHE, WRIDD Zilla Parishad BDOs , ULBs,	Mid Term to Long Term
Preparation of Scientific Wetland Management Plan for each identified Wetland based on study of individual ecosystem and local requirements.	Scientific study of ecosystem, nutrients, species count, biodiversity and other local factors including socio-economic dependence for each wetland to be taken up for each identified wetland. Involvement of Scientific Research Organisations, Expert NGOs, Local Communities etc. Based on scientific study Integrated Management Plan to be prepared for each wetland suggesting 'wise use' of wetlands, maintaining the ecological character.	Environment Department, WBPCB, District Administration, BDOs, ULBs, Fisheries Deptt, Agriculture Deptt.	Long Term

Important Note

Efforts have been made to make this District Environmental Plan in line with the Model District Environment Plan of CPCB covering the topics given therein and in compliance of the solemn order(s) of the Hon'ble National Green Tribunal. The users of this Plan should bear in mind that this plan is not a substitute to Government rules and regulations but a skeletal framework with action points and roles and responsibilities of stakeholders. These are only suggestive but not exhaustive.

ANNEXURE - I

Water Quality Data –South 24 Parganas

West Bengal Pollution Control Board

Water Quality Information System



Table : Designated-Best-Use Class of Water Criteria	
Source: http://cpcb.nic.in/water-quality-criteria/	
Drinking Water Source without conventional treatment but after disinfection (A)	
Total Coliforms Organism MPN/100ml	shall be 50 or less
pH	between 6.5 and 8.5
Dissolved Oxygen	6mg/l or more
Biochemical Oxygen Demand 5 days 20°C	2mg/l or less
Outdoor bathing (Organised) (B)	
Total Coliforms Organism MPN/100ml	500 or less
pH	between 6.5 and 8.5
Dissolved Oxygen	5mg/l or more
Biochemical Oxygen Demand 5 days 20°C	3mg/l or less
Drinking water source with conventional treatment followed by disinfection (C)	
Total Coliforms Organism MPN/100ml	5000 or less
pH	between 6 and 9
Dissolved Oxygen	4mg/l or more
Biochemical Oxygen Demand 5 days 20°C	3mg/l or less
Fish Culture and Wild life propagation (D)	
pH	between 6.5 and 8.5
Dissolved Oxygen	4mg/l or more
Free Ammonia (as N)	1.2mg/l or less
Irrigation, Industrial Cooling or Controlled Waste disposal (E)	
pH	between 6.0 and 8.5
Electrical Conductivity at 25°C micro mhos/cm	Max. 2250
Sodium absorption Ratio	Max. 27
Boron	Max. 2mg/l
Below E	
Not meeting A,B,C,D & E Criteria	

River & Ground Water Quality Data of South 24 Parganas District

West Bengal Pollution Control Board

Central Laboratory

Paribesh Bhawan, 10A, Block LA, Sector III, Salt Lake City,
Kolkata 700 106. (033) 2335-5953

Data Table - 1

GANGA AT DIAMOND HARBOUR, WEST BENGAL

Station: GANGA AT DIAMOND HARBOUR, WEST BENGAL	River Basin: GANGA	CPCB Station Code: 1469
Sample Date: 24/08/2023	Sample Time: 14:45	
Human Activities: Navigation	Weather: cloudy	Water Body: Ganga
Frequency Of Monitoring: Quarterly	Use Based Class: C	Approximate Depth(Bottom/Table): 2.00 m
Color & Intensity: Muddy	Odour: Odourless	Visible effluent discharge: None

Water Quality		
Parameter	Test Result	Unit
Ammonia-N	BDL	mg/l
BOD	2.47	mg/l
Conductivity	1001.00	µs/cm
Dissolved O ₂ (DO)	5.57	mg/l
E-coli	2300	MPN/100ml
Fecal Coliform	3300	MPN/100ml
Fecal Streptococci	17	MPN/100ml
Nitrate-N	1.20	mg/l
pH	7.71	Unit

Temperature(Water)	27.0	°C
Total Coliform	7000	MPN/100ml
Boron	BDL	mg/l
Calcium	40.00	mg/l
Chloride	244.61	mg/l
COD	13.72	mg/l
Fluoride	0.35	mg/l
Magnesium	21.87	mg/l
Nitrite N	BDL	mg/l
Phenolphthalein Alkanity	NIL	mg/l
Phosphate-P	0.06	mg/l
Potassium	8.80	mg/l
Sodium	154.00	mg/l
Sulphate	63.26	mg/l
Total Alkalinity	120.00	mg/l
Total Dissolved Solids(TDS)	660.00	mg/l
Total Fixed Solids(TFS)	804.00	mg/l
Total Suspended Solids(TSS)	220.00	mg/l
Turbidity	190.00	NTU
Total Hardness as CaCo3	190.00	mg/l

Data Table - 2

RESIDENTIAL AREA AT SONARPUR

Station: RESIDENTIAL AREA AT SONARPUR	River Basin: GANGA	CPCB Station Code: 1936
Sample Date: 13/04/2023	Sample Time: 11:35	
Human Activities: Drinking & Domestic	Weather: Sunny	Water Body: Ground Water at Sonarpur
Frequency Of Monitoring: Halfyearly	Use Based Class: A	Approximate Depth(Bottom/Table): 0.00 m
Color & Intensity: Clear	Odour: Odour free	Visible effluent discharge: None

Water Quality

Parameter	Test Result	Unit
Ammonia-N	BDL	mg/l
BOD	0.46	mg/l
Conductivity	922.90	µs/cm
Fecal Coliform	<1.8	MPN/100ml
Nitrate-N	0.31	mg/l
pH	6.88	Unit
Temperature(Water)	28.0	°C
Total Coliform	<1.8	MPN/100ml
Boron	BDL	mg/l
Calcium	152.00	mg/l
Chloride	54.98	mg/l
COD	6.86	mg/l
Fluoride	0.22	mg/l
Magnesium	19.44	mg/l
Phenolphthalein Alkalinity	NIL	mg/l
Phosphate-P	0.03	mg/l
Potassium	4.70	mg/l
Sodium	53.00	mg/l
Sulphate	46.54	mg/l
Total Alkalinity	400.00	mg/l
Total Dissolved Solids(TDS)	648.00	mg/l
Total Fixed Solids(TFS)	474.00	mg/l
Total Hardness as CaCo3	460.00	mg/l
Total Suspended Solids(TSS)	24.00	mg/l
Turbidity	3.86	NTU
Arsenic	BDL	mg/l
Cadmium	BDL	mg/l
Chromium Total	BDL	mg/l
Copper	BDL	mg/l
Iron	BDL	mg/l
Lead	BDL	mg/l

Mercury	BDL	mg/l
Nickel	BDL	mg/l
Zinc	0.12	mg/l
a-BHC	BDL	ppb
a-Endosulphan	BDL	ppb
Aldrin	BDL	ppb
b-Endosulphan	BDL	ppb
Dieldrin	BDL	ppb
g-BHC	BDL	ppb
o,p-DDT	BDL	ppb
p,p-DDT	BDL	ppb

Data Table - 3

Ground water at Shyampur, Budge Budge

Station: Ground water at Shyampur, Budge Budge	River Basin: GANGA	CPCB Station Code: 4737
Sample Date: 11/04/2023	Sample Time: 14:25	
Human Activities: Drinking & Domestic	Weather: Sunny	Water Body: Well
Frequency Of Monitoring: Halfyearly	Use Based Class: A	Approximate Depth(Bottom/Table): 0.00 m
Color & Intensity: Clear	Odour: Odour free	Visible effluent discharge: None

Water Quality		
Parameter	Test Result	Unit
Ammonia-N	0.12	mg/l
BOD	0.46	mg/l
Conductivity	2800.00	µs/cm
Fecal Coliform	<1.8	MPN/100ml
Nitrate-N	0.43	mg/l
pH	7.13	Unit
Temperature(Water)	32.0	°C
Total Coliform	<1.8	MPN/100ml
Boron	BDL	mg/l
Calcium	316.00	mg/l
Chloride	849.74	mg/l
COD	8.75	mg/l
Fluoride	0.16	mg/l

Magnesium	36.45	mg/l
Phenolphthalein Alkanity	NIL	mg/l
Phosphate-P	0.01	mg/l
Potassium	4.80	mg/l
Sodium	191.00	mg/l
Sulphate	15.07	mg/l
Total Alkalinity	330.00	mg/l
Total Dissolved Solids(TDS)	2636.00	mg/l
Total Fixed Solids(TFS)	1692.00	mg/l
Total Hardness as CaCo3	940.00	mg/l
Total Suspended Solids(TSS)	18.00	mg/l
Turbidity	2.77	NTU
Arsenic	BDL	mg/l
Cadmium	BDL	mg/l
Chromium Total	BDL	mg/l
Copper	BDL	mg/l
Iron	0.43	mg/l
Lead	BDL	mg/l
Mercury	BDL	mg/l
Nickel	BDL	mg/l
Zinc	1.02	mg/l
a-BHC	BDL	ppb
a-Endosulphan	BDL	ppb
Aldrin	BDL	ppb
b-Endosulphan	BDL	ppb
Dieldrin	BDL	ppb
g-BHC	BDL	ppb
o,p-DDT	BDL	ppb
p,p-DDT	BDL	ppb

Data Table - 4

AMTOLA ON DIAMOND HARBOUR ROAD, 24 PARGANAS (S)

Station: AMTOLA ON DIAMOND HARBOUR ROAD, 24 PARGANAS (S)	River Basin: GANGA	CPCB Station Code: 2547
Sample Date: 10/04/2023	Sample Time: 15:00	
Human Activities: Drinking & Domestic	Weather: Sunny	Water Body: null
Frequency Of Monitoring: Halfyearly	Use Based Class: A	Approximate Depth(Bottom/Table): 0.00 m
Color & Intensity: Clear	Odour: Odour free	Visible effluent discharge: None

Water Quality		
Parameter	Test Result	Unit
Ammonia-N	BDL	mg/l
BOD	0.51	mg/l
Conductivity	1135.00	µs/cm
Fecal Coliform	6.8	MPN/100ml
Nitrate-N	0.50	mg/l
pH	7.78	Unit
Temperature(Water)	30.0	°C
Total Coliform	22	MPN/100ml
Boron	BDL	mg/l
Calcium	68.00	mg/l
Chloride	224.93	mg/l
COD	9.44	mg/l
Fluoride	0.28	mg/l
Magnesium	19.44	mg/l
Phenolphthalein Alkalinity	NIL	mg/l
Phosphate-P	0.03	mg/l
Potassium	4.50	mg/l
Sodium	153.00	mg/l
Sulphate	64.47	mg/l
Total Alkalinity	170.00	mg/l
Total Dissolved Solids(TDS)	670.00	mg/l
Total Fixed Solids(TFS)	574.00	mg/l
Total Hardness as CaCo3	250.00	mg/l
Total Suspended Solids(TSS)	38.00	mg/l
Turbidity	2.37	NTU
Arsenic	BDL	mg/l
Cadmium	BDL	mg/l
Chromium Total	BDL	mg/l
Copper	BDL	mg/l
Iron	0.12	mg/l
Lead	BDL	mg/l
Mercury	BDL	mg/l
Nickel	BDL	mg/l
Zinc	BDL	mg/l
a-BHC	BDL	ppb
a-Endosulphan	BDL	ppb
Aldrin	BDL	ppb
b-Endosulphan	BDL	ppb
Dieldrin	BDL	ppb
g-BHC	BDL	ppb
o,p-DDT	BDL	ppb
p,p-DDT	BDL	ppb

ANNEXURE -11

Air Quality Data –South 24 Parganas West Bengal Pollution Control Board Air Quality Information System



Air Quality of 24 Parganas(S) as on 02/09/2023

Source : <http://emis.wbpcb.gov.in/airquality/JSP/aq/districtwiseReport.jsp>

Pollutant	Concentration ($\mu\text{g}/\text{m}^3$)
PM10	30
NO2	57.67
SO2	29.33

Air Quality Status: Satisfactory

Air Quality Index (AQI)			
AQI	Remark	Color Code	Possible Health Impacts
0-50	Good		Minimal Impact
51-100	Satisfactory		Minor breathing discomfort to sensitive people
101-200	Moderate		Breathing discomfort to the people with lung, heart disease, children and older adults
201-300	Poor		Breathing discomfort to people on prolonged exposure
301-400	Very Poor		Respiratory illness to the people on prolonged exposure
>400	Severe		Respiratory effects even on healthy people

Revised National Ambient Air Quality Standards (NAAQS)

[NAAQS Notification dated 19th November, 2009]

S. No.	Pollutants	Time Weighted Average	Concentration in Ambient Air		Methods of Measurement
			Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (notified by Central Government)	
1	Sulphur Dioxide (SO ₂), µg/m ³	Annual*	50	20	1. Improved West and Gaeke 2. Ultraviolet Fluorescence
		24 Hours**	80	80	
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual*	40	30	1. Modified Jacob & Hochheiser 2. Chemiluminescence
		24 Hours**	80	80	
3	Particulate Matter (Size <10µm) or PM ₁₀ , µg/m ³	Annual*	60	60	1. Gravimetric 2. TEOM 3. Beta attenuation
		24 Hours**	100	100	
4	Particulate Matter (Size <2.5 µm) or PM _{2.5} , µg/m ³	Annual*	40	40	1. Gravimetric 2. TEOM 3. Beta attenuation
		24 Hours**	60	60	
5	Ozone (O ₃), µg/m ³	8 hours**	100	100	1. UV photometric 2. Chemiluminescence 3. Chemical Method
		1 hours**	180	180	
6	Lead (Pb), µg/m ³	Annual*	0.50	0.50	1. AAS/ICP Method after sampling using EPM 2000 or equivalent filter paper 2. ED-XRF using Teflon filter
		24 Hour**	1.0	1.0	
7	Carbon Monoxide (CO), mg/m ³	8 Hours**	02	02	Non dispersive Infra Red (NDIR) Spectroscopy
		1 Hour**	04	04	
8	Ammonia (NH ₃), µg/m ³	Annual*	100	100	1. Chemiluminescence 2. Indophenol blue method
		24 Hour**	400	400	
9	Benzene (C ₆ H ₆), µg/m ³	Annual*	05	05	1. Gas chromatography based continuous analyzer 2. Adsorption and Desorption followed by GC analysis
10	Benzo(a)Pyrene (BaP)-particulate phase only, ng/m ³	Annual*	01	01	Solvent extraction followed by HPLC/GC analysis
11	Arsenic (As), ng/m ³	Annual*	06	06	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper
12	Nickel (Ni), ng/m ³	Annual*	20	20	AAS/ICP method after sampling on EPM 2000 or equivalent filter paper

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform interval. ** 24 hourly 08 hourly or 01 hourly monitored values, as applicable shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

NOTE: Whenever and wherever monitoring results on two consecutive days of monitoring exceed the limits specified above for the respective category, it shall be considered adequate reason to institute regular or continuous monitoring and further investigation.

ANNEXURE - III

Important Environmental Laws and Regulations for Coastal Districts

Major Acts/ Policies related to Coastal Zone Management	Brief description of the Acts/ Policies
Environmental Protection Act, 1986	Under this, the Coastal Regulation Zone 1991 has been notified. It authorizes the central government to protect and improve environmental quality, control and reduce pollution from all sources, and prohibit or restrict the setting and /or operation of any industrial facility on environmental grounds.
Major Port Trust Act, 1963	Protection of environment and containing discharge of noxious wastes/filth/rubbish
The Indian Ports Act, 1908	Enactment relating to ports and port charges. Provides for rules for the safety of shipping and conservation of ports.
Merchant Shipping Act, 1958	Control of pollution from ships and off-shore platforms
The National Environment Tribunal Act, 1995	This has been created to award compensation for damages to persons, property and the environment arising from any activity involving hazardous substances
The National Green Tribunal Act, 2010	The Act provides for the establishment of a National green tribunal for the effective and expeditious disposal of cases relating to environmental protection, conservation of forests, and etc.
Maritimes Zones Act, 1976	Describes various zones such as territorial waters, EEZ, Continental shelf etc.
Coast Guard Act, 1978	Provides levying of heavy penalties for the pollution of port waters. In 1993, Coast Guard under Ministry of Defence, made directly responsible for combating marine pollution. National Oil Spill Disaster Contingency Plan, formulated in 1996, under Coast Guard Act lays down action to be taken in the event of oil spills.
Hazardous Waste Management Act, 1989	It deals with proper collection, reception, treatment, storage and disposal of hazardous wastes.
Water (Prevention & Control of Pollution) Act, 1974	Control of pollution from land-based sources includes tidal waters, unlike many other countries and has jurisdiction upto 5 km in the sea.
Biological Diversity Act, 2002	The Act covers conservation, use of biological resources and associated knowledge occurring in India for commercial or research purposes or for the purposes of bio-survey and bio-utilisation. It provides a framework for access to biological resources and sharing

	the benefits arising out of such access and use. The Act also includes in its ambit the transfer of research results and application for intellectual property rights (IPRs) relating to Indian biological resources.
Indian Fisheries Act, 1897	Offers protection to fisheries against explosives or dynamites.
Marine Fishing Regulation Act (MFRA), 1978	A model act, which provides guidelines to the maritime states to enact laws for protection to marine fisheries by regulating fishing in the territorial waters. The measures include: regulation of mesh size and gear, reservation of zones for various fishing sectors and also declaration of closed seasons. Laws framed and amended from time to time by different maritime states. Coastal states ban fishing during closed season. Different closure period for different states.
Deep Sea Fishing Policy, 1991	Allows foreign fishing vessels into Indian waters beyond 12 nautical miles. Protests from local fishermen Charter and leasing operations of foreign trawlers suspended in 1997.No granting of new licences to joint venture companies operating in the EEZ Deep Sea Fishing Policy, 1991 practically scrapped in 1997.
Forest Conservation Act, 1980	The Act is an interface between conservation and development. It also permits judicious and regulated use of forest land for non-forestry purposes.
Wildlife Protection Act, 1972	Offers protection to marine biota. Creates conditions favourable for <i>in situ</i> conservation of fauna and flora. Amended in 1991 to prohibit fishing within the sanctuary area Gahirmatha, annual mass nesting place for Olive Ridley turtle, an endangered species, accorded the status of marine sanctuary in 1997. Amended in 2001 to include several species of fish, corals, sea cucumbers and sea shells in Schedule I and III. Whale shark placed in schedule I.
Forest Conservation Act, 1980	Forest Conservation Act, 1980 provides for regulatory mechanism controlling indiscriminate diversion of forest lands for non-forestry purposes and strives to maintain a balance between conservation and development needs. The Act also provides for compensatory afforestation, catchment area treatment plan, wild life habitat improvement plan and rehabilitation plan in case diversion of forest land for non-forest purposes is approved.
Coastal Regulation Zone Notification 1991, 2011, 2019	The objective of the original CRZ Notification was protection and sustainable development of the coastal stretches and marine environment through sustainable coastal zone management practices based on sound scientific principles taking into account the vulnerability of the coast to natural hazards, sustainable livelihood security for local communities, and conservation of ecologically and culturally significant coastal resources.

