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BIODIVERSITY OF PANJE WETLAND

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ABSTRACT :

The Panje wetland is supported by diverse life forms. A few decades back heavy industrialization and consequent urbanization had occurred in Navi- Mumbai as well as in Uran city. Both are the fast growing and developing cities. The growing population, industrialization, development of concrete jungles has adverse effect on environment. The wetlands are not exceptional from it. Wetland supports good diversity of mangroves and birds including Flamingos. It is necessary to keep in check on the avifauna and flora of these places to note down the effect of surrounding development on them. These observations suggest that in spite of the poor status of wetland there were quite few numbers of migratory birds, reptiles, insects, and fishes. If proper measures are not undertaken, within short duration no wetland will be seen in these areas. It is possible to revive the wetland ecosystem if remedial measures such as reduction of sewage and solid wastes at source, landfilling, proper water supply from sea, plantation of mangroves, and prevention of mud in runoff are implemented. The local fishermen can be encouraged to practice mangrove based productive activities.

INTRODUCTION

The state of Maharashtra is blessed with a large number of coastal and inland wetlands. These areas such as backwaters, rivers, lakes, reservoirs, which are permanently saturated with surface or ground water, play an important role in the state's ecosystem and natural resource wealth. The wetlands support a variety of coastal and inland aquatic plant and animal life along with the littoral and riparian biodiversity. The wetlands are credited with several benefits to the local environment such as influencing the local hydrological cycle, climatic regime, water purification, flood control, and giving stability to the shoreline. Besides, these crucial natural resources support rich and diverse food chains for the hundreds of species of animals including birds, both local and migratory, from within and outside India. Fishing in these wetlands is the main livelihood for millions of traditional fishermen communities.

Wetland area in the 35 districts of Maharashtra state is estimated to be 1014522 ha as compared to the total geographic area of 307748 sq km which accounts to 3.30% of the total geographical area of the state. The district with largest wetlands area is Mumbai suburban (24.87%) and Mumbai Urban (11.06%) of their total area due to the coastal wetlands. Mumbai is a well-known and important site for migratory birds due to its

extensive mudflats, favorite foraging areas for shorebirds— some of the key areas are Mahul, Sewri Creek, Thane Creek and wetlands and Navi Mumbai. But these areas are under huge anthropogenic pressure, as urban lands replacing the natural habitats.

WETLANDS

Wetland is called "kidney of the earth", the natural reservoir and species bank , in general wetlands are identified in the major types as Coastal Wetlands; classified as mangroves/creeks, intertidal mud flats/beaches/shores and salt pans/fish farms, and Inland Wetlands i.e. rivers/streams, tanks/ponds and reservoirs/barrages. It is well known that Wetlands are among the world's most productive environments. They provide tremendous economic benefits to mankind through fishery production, the maintenance of water table for agriculture, water storage, and the reduction of natural hazards like floods and draughts.

Wetlands also contribute to shoreline stabilization, waste disposal, and water purification, and are very popular recreational sites. In addition they have great value from an aesthetic point of view and as landscape. However, today over emphasis is given to maximization in the use of freshwater wetlands i.e. rivers, reservoirs and minor irrigation tanks (M I Tanks) as a sole purpose of dedicated water supply for agriculture, industry and city water supply. This has seriously undermined its other more important and long term ecological functions and values of natural water resources.

What is grossly ignored today is that wetlands provide critical habitats for many species of fauna and flora. Countless mammals, birds, reptiles, amphibians, fish and invertebrate species, quite often threatened with extinction, depend on these habitats for their survival. Their value is further evidenced by the fact that wetlands can produce up to eight times as much plant matter as wheat fields (Ramsar, 1971). This productivity depends on proper ecological functioning of wetlands.

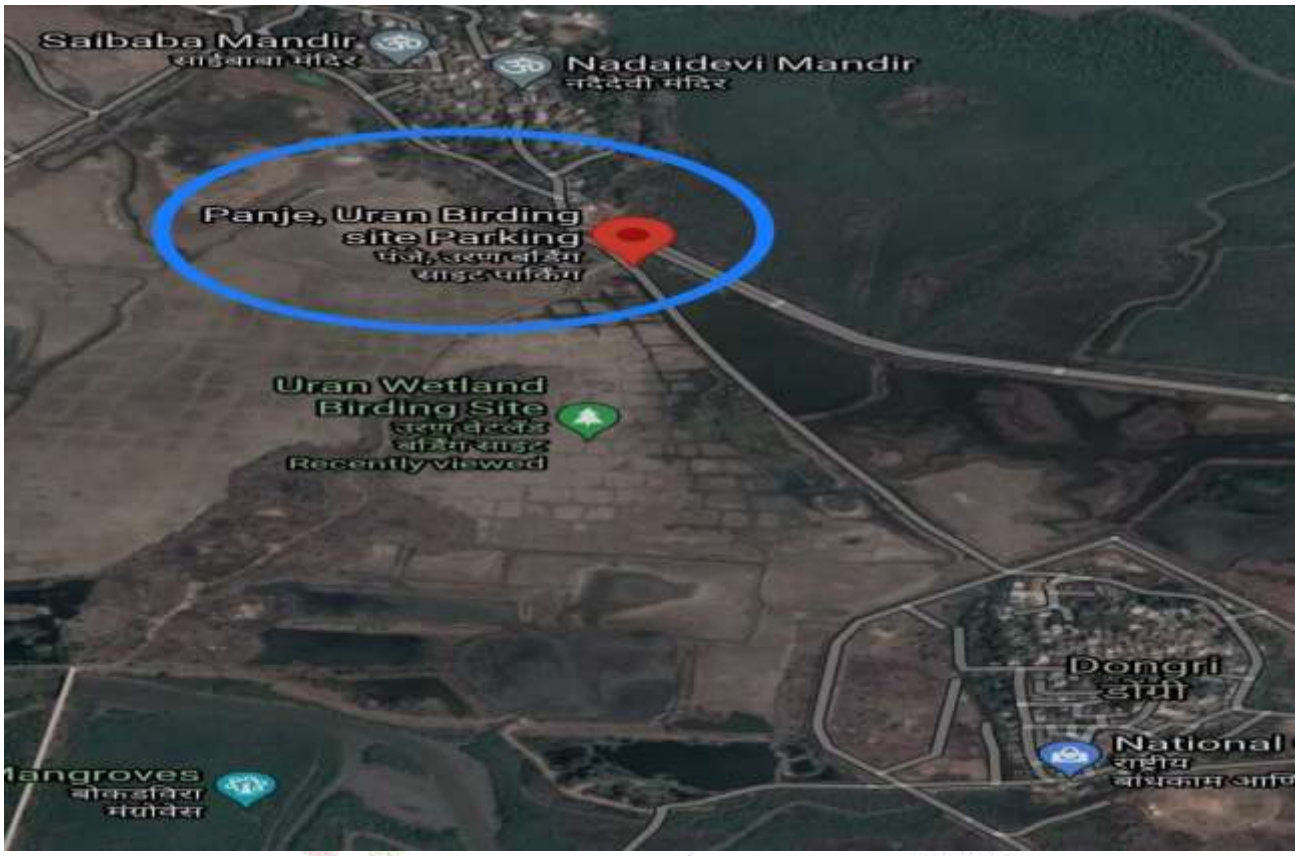
However, these wetlands, particularly natural and old manmade, are among the most threatened habitats today due mainly to drainage, land reclamation, pollution, and over exploitation of wetland species, Currently, these wetlands are in grave threat from unsustainable developmental activities, especially landfilling for residential, recreational and commercial purpose. Though these wetlands constitute a small fraction of area, they support around a quarter of a million birds belong to more than a hundred species and most of them are migratory with declining populations around the globe. The increasing threats to wetlands have been widely recognized, and action plans drawn to address them (Ramsar Convention Secretariat, 2018).

There have been some success stories, including the inventory by the Ramsar Convention of over 2300 sites, covering nearly 250 million km2, as wetlands of international importance,

representing 13–18% of total area of the world's wetlands (Davidson and Finlayson, 2018).

However, wetlands now cover only a fraction of their original range. Where data exist, nearly 35% of wetlands have been lost since 1970, and up to 87% since 1700 (Davidson, 2014). The Wetland

Extent Trends Index confirms that the decline of wetlands continues at a rapid rate (Dixon et al., 2016). Unsurprisingly, many populations of wetland-dependent species are in long-term decline and threatened with extinction. According to the IUCN Red List (www.iucnredlist.org), 25% of the roughly 20,000 wetland-dependent assessed species are endangered or critically endangered. Moreover, 34% of inland species dependent on rivers and streams are globally threatened, as are 20% of those of marshes and lakes. According to the Living Planet Index, 81% of populations of freshwater species have declined since 1970 – far greater than the decline of species depending on other ecosystems (WWF, 2016). Overall, tropical wetlands are more threatened than those of temperate regions (WWF, 2012).



PANJE WET LAND (GOOGLE MAP)

Panje wetland

Panje wetland

LOCATION

This wetland is located on the west of Dongri and Panje villages (18°54'0.95"N, 72°57'2.04"E). It is enclosed by 8-10 feet high concrete wall and therefore almost isolated from tidal influence. West side of the wetland bordered with a narrow patch of mangrove (300–500m wide and 1.5 km long), whereas east side surrounded with degraded mangroves, villages and roads. Internally, the wetland is divided into a number of

compartments using soil bunds, usually, most of the area is shallow but some parts are excavated and deepened for fishing. These areas are transformed into reeds.

A narrow creek on the west side of the wetland runs in the northwest to southeast direction from Mora to Funde, is replenishes it through discharging water during high tide. However, the quantity of water entering the wetland is controlled by a tidal gate and three single concrete pipe culverts on this creek .A tidal gate is located (18°53'41.25"N, 72°56'50.14"E) on the southwest of the wetland. It is about 40m wide and 7-8m high with two rows of square iron flap valves (35 above and 35 below). This gate is constructed and monitored by CIDCO.

Area	124 ha
Number of bird species	50
Number of individuals	565 (minimum)–11560 (maximum)
Number of migratory species	31
Number of near-threatened species	6
Number of vulnerable species	1
Wildlife Protection Act schedule species	Schedule I–5, Schedule IV –45
The numbers of birds in the winter season can reach up to 50,000	
Remark: The site was notified as a Special Economic Zone (SEZ) of Uran, Navi Mumbai in 2009	

The survey was done by Bombay Natural History Society BNHS (2019).

METHODOLOGY

Mammalian fauna was recorded by direct sightings. Birds were monitored 200m from 21 November 2021 to 27 November 2021 by using binoculars (8x30) and telescope (20x). Intensive surveys in the potential habitats and mist netting of the birds were also attempted so as to cover as many number of bird species occurring in the area. The nomenclature used for bird species follows Manakadan & Pittie (2002).

Birds were categorized based on the status of birds as R-Resident (species found throughout the year in the study area), M-Migrant (species migrate from other countries and migrate locally within the country). Benthos, especially marine annelids (polychaetes), molluscs and crustacea (crabs, prawns, and shrimps), barnacles and insects were photographed on the field. Fish trapped in nets were also collected from fishermen.

Tidal gate

RESULTS

Both invertebrates and vertebrates were studied. Among invertebrates were marine annelids, molluscs and arthropods (crustaceans, insects). Vertebrates included fish, reptiles, birds and mammals.

Table 1: List of the reptiles sighted at Panje Wetland

Sr. No	Common name	Scientific name
1.	**Indian rat snake**	***Ptyas mucosa***
2.	**Brahminy worm snake**	***Indotyphlops braminus***
3.	**Checkered keelback**	***Xenochrophis piscator***
4.	**Forsten's cat snake**	***Boiga forsteni***
5.	**Indian rock python**	***Python molurus***
6.	**Cobra**	***Naja***
7.	**Common trinket**	***Coelognathus helena***

Table 2: List of the birds sighted at Panje Wetland

Sr. No.	Common Name	Scientific Name	IUCN status	M/R
1	Black tailed godwit	*Limosa*	NT	M
2	Black winged stlit	*Himantopus himantopus*	LC	R
3	Western marsh harrier	*Circus aeruginosus*	LC	M
4	Common redshank	*Tringa totanus*	LC	M
5	Eurasian coot	*Fulica atra*	LC	R
6	Eurasian spoonbill	*Platalea leucorodia*	LC	M
7	Great egrate	*Casmerodius albus*	LC	R
8	Greater flamingo	Phoenicopterus roseus	LC	M
9	Greater sand plover	Charadrius leschenaultii	LC	M
10	Gull billed tern	Gelochelidon nilotica	LC	M
11	Indian skimmer	Rynchops albicollis	V	M

12	Indian pond heron	Ardeola grayii	LC	R
13	Little cormorant	Phalacrocorax niger	LC	R
14	Marsh sandpiper	Tringa stagnatilis	LC	M
15	Red wattled lapwing	Vanellus indicus	LC	R
16	Whiskered tern	Chlidonias hybrida	LC	M

IUCN=International Union for Conservation of Nature; LC=Least concerned; NT=Near threatened; V=Vulnerable; M=Migratory; R=Residential; Min=Minimum; Max=Maximum.

Table 3: List of the Fishes, Crustaceans, Gastropods and Shelfish sighted at Panje Wetland

Fishes	Crustacean	Gastropods	Shell fishes
Catfish	Giant mud crab	Cerithideopsilla djadjaviaensis	Oysters
Mudskipper	Peregrine crab	Telescopium	Cherrystone clams
Prawns	Hermit crab	Melampus scyeleheocis	Mussels
Tilapia	Shrimp		Little neck clams
Guppy			
Snake eel			

CONCLUSION

Present study illustrates the importance of the area as a good habitat for avifauna. The number and types of species of wildlife a habitat supports indicate its health. Panje wetland supports a rich biodiversity. The presence of resident and migrant birds in and around the lake indicates that the habitat is rich enough to attract them and make them spend their winter months.

a.) Black winged slit

b.) Black tailed godwit

c.) Little coemorant

d.) West marsh harrier

e.) Greater flamingo

f.) Marsh sandpiper

g.) Lesser flamingo

Large congregation of birds both migratory and local migratory such as sandpipers, plovers, stints, shanks, curlews, terns, gulls and flamingos are indicators of good habitat.

The area not only serves as a wintering ground but also as a staging ground. The area is a large roost of flamingos, gulls, terns and small waders. The creek serves as life saviour for flamingos - a local migrant from Kutch region, Gujarat.

About 8% of industries in the country are located around Mumbai and Thane. Jawaharlal Nehru Port Trust (JNPT) at Navi Mumbai is the premier container handling port in India, accounting for around 50% of the total containerized cargo volume, across the major ports of India. It is ranked 33rd in the list of top 100 Container Ports globally. Ports of Singapore Authority (PSA) constructed 1 km long container terminal on the south-eastern side of the JNPT, near Panje, Uran and was opened on 2nd February 2018.

Around 85% of Uran's wetlands have been destroyed. Recurring cases of mangrove destruction (9500 trees) and reclamation of wetlands have happened at Uran. Recently illegal landfills are on the rise and the wetlands are being slowly assimilated in the coastal city. This unprecedented land development and urbanization are creating concerns about the impact on the environment. This is because the wetlands serve as a natural sponge absorbing excess rainfall and doing its bit to reduce pollution. Wetlands are under threat due to exponential expansion of real-estate projects in Mumbai Now a day, land encroachment and land alteration are the important aspect of threats for Panje wetlands.

There is an urgent need for a detailed study and assessment of shorebirds and benthic fauna in the potential influence area should be carried out to understand the impact of this urbanization and development on the shorebirds and to develop an appropriate conservation plan.

THREATS OF PANJE WETLAND

- Landfilling
- Excavation
- Blocking of tidal water
- Intensive fishing
- Health-related issues in nearby villages
- Overcrowding of spectators and birdwatchers

Destruction of wetland between Uran -Bokadvira by landfilling

IMPACT OF PANJE WETLAND DESTRUCTION

- Partial or complete destruction of this wetland would lead to the displacement of a large population of the water birds, which may induce random movement of the flocks in search of suitable high tide roosts or increase competition for space and food in already existing habitat due to overpopulation. In both, the scenarios birds will be under tremendous stress and are more likely to spend much time in the air and form large flocks which seem alarming for aircraft.
- Water birds will lose a large amount of energy in search of new habitats or while competing in existing habitat or if they found suitable roost at a longer distance, ultimately, they may not store the fats (energy reserve) essential for completing their migration. It would adversely affect the survival of the birds and will impact negatively to already declining populations of these species.
- Stagnation of sewage water, rainwater and tide water during highest tide in villages, especially around creek/water channels will cause serious health and hygiene issues due to blocking of high tide water.
- Loss of this wetland will pose extremely high risk of bird hazard to Navi Mumbai International Airport

MEASURES OF PRESERVATION OF PANJE WETLAND

- Panje Wetland is the largest migratory water bird congregation site in Navi Mumbai and one of the best birding sites in Maharashtra. We suggest declaring this and other wetlands as protected areas associated with Thane Creek Flamingo Sanctuary because water birds from the sanctuary are using these wetlands as high tide roost when sanctuary gets flooded during high tide. One of the most critical factors in sustaining bird population in this wetland is the presence and depth of water, preferably less than 25cm deep (< 10 cm deep would be ideal).
- Recommend 20-25 flaps of tidal gate should be opened periodically to replish the wetland and pipe culverts are also operated accordingly to maintain a desirable level of water and avoid excessive draining which eventually dries the wetland.
- Landfilling, excavation of soil and deepening of the wetland should be strictly prevented. Intensive fishing should be avoided and two hours before and after high tide (total four hours) would be declared as no fishing hours. A number of people visiting a wetland, especially birdwatchers and spectators, should be regulated in order to prevent excessive stress on birds due to human disturbances.
- Certain areas along the wetland can be managed as tourist spots and as environmental education centres along with the involvement of local community. Environmental awareness programme among the locals should be started for the conservation of biodiversity of the panje wetland.
- The area can be declared as a center for migratory birds study, and also as an interpretation centre to create awareness about wildlife importance to the public

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