

Impact of Oil Spillage on Biodiversity in and around Maguri-Motapung Beel of Assam

Nipen Nayak* and Shyama Prasad Biswas

Department of Life Sciences, Dibrugarh University, Assam, India

Abstract

Maguri-Motapung beel complex is an important bird sanctuary with rich grassland and wetland ecosystem located adjacent to Dibru-Saikhowa National Park (DSNP) of Assam. A network of channels that connect the wetlands with the river Dibru, a tributary of Brahmaputra that passes through the national park. The region is reported to harbour about 80 fish species 26 species of mollusc while about 500 species of birds, 42 species of reptiles, 37 species of mammals and 17 species of amphibians were recorded from the nearby DSNP. However, the reason is frequently in news for activities like over exploitation, deforestation, encroachment, fish poisoning and different anthropogenic activities.

Keywords: Spillage; Biodiversity; Maguri-Motapung beel complex; Grass land birds

Introduction

The exploration for oil was also a major threat to the biodiversity that exist in and around the area. A devastating oil blow out in Baghjan, an area which is around 2 km away from Maguri-Motapung Beel Complex (MMBC) on 27th May, 2020 resulted in spillage of gas and crude oil into the neighbouring areas. The objective was to know the first hand information on impact of oil spillage on water bodies, floral composition, fish and other aquatic biota and grass land birds in and around MMBC, Assam. A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins. $Disasters = (Vulnerability + Hazard) / Capacity$. Disasters are often used synonymously with the word Hazard. But presently, these two terms are understood in a much varied sense. Hazards are defined as phenomena that pose a threat to people, structures or economic assets and which may cause a disaster. Hazard is a threat, while disaster is an event. A disaster occurs when a hazard impacts on vulnerable people.

The combination of hazards, vulnerability and inability to reduce the potential negative consequences of risk results in disaster. Developing countries and the poorer sections of the society suffer the most when a disaster hits more than 95% of all deaths caused by hazards occur in developing countries, and losses due to natural hazards are 20 times greater (as a percentage of GDP) in developing countries than in industrialized countries. No matter what society disasters occur in, they tend to induce change in government and social life. They may even alter the course of history by broadly affecting entire populations and exposing mismanagement or corruption regardless of how tightly information is controlled in a society. The word disaster is derived from middle french desastre and that from old Italian disastro, which in turn comes from the Ancient Greek pejorative prefix dus, meaning "bad" and aster meaning "star". The root of the word disaster ("bad star" in Greek) comes from an astrological sense of a calamity blamed on the position of planets [1].

Materials and Methods

A three day survey (5th-7th June, 2020) was conducted around 5 km radius area and four sampling stations were selected for our study designated as site 1, site 2, site 3 and site 4 respectively. Of these, sites 1 and 2 are the wetland bodies at around 2 km distance from the oil field, site 3 is a river stretch within the wetland complex and about 3-4 km from the oil field, while site 4 is a paddy field around 4-5 km away from the oil field. The water samples were collected and pH, D.O, turbidity, alkalinity and hardness parameters were calculated following APHA. The vegetation loss and floral composition was evaluated primarily through visual and photographic observation as public movement was restricted due to continuous oil spillage [2]. Similarly, the presence of bird species was also assessed primarily through visual observation considering 4 imaginary transect lines from the actual site of oil spillage to our study areas. Aquatic biota was assessed with the help of local fisherman who mostly use khewali jaal, a type of cast net. Socio-economic information was based on the secondary information conducted by different workers and comparing the occupation of major portion of the population [3].

Maguri-Motapung wetland, there's its incredible scenery that most people have not had the privilege of seeing with their own eyes. It serves as a refuge and food source to many species, including residents and migratory birds, and aquatic animals who call the wetland home. It is a critical part of the Dibru-Saikhowa Biosphere Reserve, forming an environmental corridor to Namdhapa National Park. With a variety of amazing flora and fauna and impressive terrain, one must-see for one's self what this place has to offer first hand. Check the below-mentioned facts about Maguri Motapung Beel for the IAS Exam preparation [4].

***Corresponding author:** Nipen Nayak, Department of Life Sciences, Dibrugarh University, Assam, India E-mail: rs_nipennayak@dibru.ac.in

Received: 01-Sep-2023, Manuscript No. EPCC-23-24815; **Editor assigned:** 04-Sep-2023, PreQC No. EPCC-23-24815 (PQ); **Reviewed:** 18-Sep-2023, QC No. EPCC-23-24815; **Revised:** 1421-Sep-2023, Manuscript No. EPCC-23-24815 (R); **Published:** 21-Sep-2023, DOI: 10.4172/2573-458X.1000350

Citation: Nayak N, Biswas SP (2023) Impact of Oil Spillage on Biodiversity in and around Maguri-Motapung Beel of Assam. Environ Pollut Climate Change 7: 350.

Copyright: © 2023 Nayak N, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Maguri-Motapung beel-why in news?

The beautiful and uncommon Mandarin duck has been swimming in the Maguri-Motapung wetland in Assam's Tinsukia region. The duck was reportedly seen first on February 8th of 2021 and was first spotted by Madhab Gogoi, a birder and tour guide in Tinsukia. This attractive bird quickly became a celebrity in the marshy wetland-which was impacted by an explosion and fire at a nearby natural gas well in May 2020 [5].

What is the mandarin duck?

The Mandarin duck, also known as the *aix galericulata*, is a small exotic-looking bird native to East Asia. Swedish botanist Carl Linnaeus first discovered it in 1758. These ducks are exceptionally beautiful, with magnificent colours that can be spotted from quite a distance!

- This duck populates near waterways such as marshes, rivers, swamps, lakes in temperate woods.
- Russia, Korea, Japan, and northeastern China are breeding grounds for this migratory duck.
- On the other hand, the Mandarin duck seldom travels to India since it is not on its typical migratory path. Only a few sightings have been reported in this area.
- The duck was previously identified in 1902 in the Rongagora district of Tinsukia, near the Dibru River.

Water parameters	Site 1	Site 2	Site 3	Site 4
pH	6.4 ± 0.4	6.8 ± 0.23	7.2 ± 0.54	6.5 ± 0.37
Dissolved oxygen (mg/L)	4 ± 0.72	5.5 ± 0.32	7.34 ± 1.01	5.12 ± 0.21
Alkalinity	83.5 ± 13.12	60.2 ± 2.76	35 ± 5.34	75.2 ± 12.2
Hardness (mg/L)	139 ± 7.67	98 ± 0.21	55 ± 4.34	145 ± 12.87
Turbidity (cm)	136.71 ± 6.1	98 ± 8.90	86 ± 2.40	113 ± 0.90
Oil content (ml/L of H ₂ O)	2.1 ± 0.43	0.34 ± 0.1	0.22 ± 0.018	1.8 ± 1.70

Table 1: Selected water parameters at different sites of maguri-motapung complex.

The parameters as recorded in site 1, 2 and 4 were not in ideal for aquatic life. However, site 3 was comparably less affected but damage to aquatic life was also seen in this site [7].

Threat to the fish diversity

Maguri-Motapung is considered as fish paradise with many important fish species like *Channa bleheri*, *Badis badis*, *Channa stewartii*, *Botia dario*, *Clarias magur* etc. that the wetland harbours. DSNP is also home to many endemic fish species. The oil spillage is a threat to the fish diversity that exists in and around the wetland complex. At least one juvenile gangetic dolphin and many aquatic birds were killed in the initial days of oil spillage. The mortality of fish and birds were however, decreased after the monsoon rain and resultant flood [8].

Threat to grassland birds

The beel was declared as Important Bird Area (IBA) with the presence of many endemic and rare species like Jerdon's babbler,

- It was last seen in Manipur's Loktak Lake in 2013 and Assam's Manas national park and Tiger reserve in 2014.

Characteristics

- It is often regarded as one of the most stunning ducks on the planet.
- The male Mandarin is quite handsome with orange plumes on his cheeks, pale orange on his sides, and orange sails on his back. Though not as spectacularly dressed as the male, the female is no less lovely. Her head sports grey feathers; brown feathers cover her back, and her eyes are framed by white like an eyestripe [6].

Results and Discussion

Health of the water bodies

Species composition of any ecosystem directly impacts the health of an ecosystem. Due to the recent incident an oily layer was seen above the water at least at a distance of 5 km away from oil spill area. Apart from that others parameters recorded in study sites suggested that there is change in overall health of the water bodies. Selected water parameters as recorded in different sites showed considerable variations (Table 1) [4].

Marsh babbler, Swamp prinia and Black breasted parrotbill. Habitat destruction was already a major concern for the bird species existing in this area. The oil spillage had greatly destroyed the habitat of these birds enormously. There was no trace of any grassland birds observed in the study areas during the survey [9].

Threat to other aquatic biota

Apart from fishes and grasslands, the area is also known to harbour many aquatic vegetation, 26 freshwater mollusc, migratory birds as well as critically endangered gangetic dolphin. Aquatic organisms are very sensitive towards and only few species could hardly resist the changes in their environment. As shown in Table 1 there was definite change in the health of the water bodies which were not suitable for the life of aquatic organisms. Thus, the restoration of aquatic life in the area will be a major challenge [10].

Threat to the floral composition

In spite of activities like oil exploration, poaching, deforestation etc. the area sustained the vegetation cover due to the prevalence of suitable climatic condition. The aquatic and terrestrial vegetation was

habitat to many aquatic biota as well as grassland birds. The habitat destruction will thus have adverse affect on the existence of those species in this area [11].

Socio-economic impact

The people that inhabit beside are directly or indirectly dependent on the beel for their livelihood. It was estimated that the primary occupation of 49.5% people of Maguri-Motapung village was fishing while 23.5% were farmers (rice and tea). Thus, oil spillage had direct impact on the primary occupation of the major portion the population of the village [12].

Conclusion

The village was already facing the problems of flood, over-exploitation, land infertility and illegal means of fishing in recent times. The spillage of Baghjan oil field for more than 4 months now have caused a havoc on the livelihood of the people due to their complete dependency on ecosystem services provided by wetland. It will require a combine effort of administration as well as community to revitalize the status of the area that it had earlier.

Acknowledgement

The authors are thankful to department of life sciences, Dibrugarh university for providing the necessary facilities in completing the research work.

References

1. Gilcreas FW (1966) Standard methods for the examination of water and waste water. *Amer J Pub Healt Nat Healt* 56: 387-388.
2. Bhatta LD, Chaudhary S, Pandit A, Baral H, Das PJ, et al. (2016) Ecosystem service changes and livelihood impacts in the maguri-motapung wetlands of assam india. *Land* 5: 15.
3. Boruah S, Biswas SP, Sharma A, Ganguli P (2008) Land use land cover changes: Its impact on the wetland ecosystem of maguri beel, Assam. *Conserv Restor Lakes* 5: 605-616.
4. Choudhury AU (1997) The status of the birds of dibru saikhowa wildlife sanctuary, Assam, India. *OBC Bulletin* 25: 27-29.
5. Choudhury AU (2002) Globally threatened birds in Dibru Saikhowa biosphere reserve. *Himal Bio Reserv* 4: 49-54.
6. Kalita P, Pathak S, Deka P (2016) A preliminary study on ichthyofaunal resource of Motapung-maguri beel of tinsukia district of Assam, India. *Int J Fauna Bio Stud* 3: 97-102.
7. Kardong D, Puzari M, Sonowal J (2016) Diversity of freshwater mollusc in maguri beel-A floodplain wetland of Tinsukia district in Assam, India. *Int J Curr Res* 8: 29169-29176.
8. Nongmaithem R, Lodhi MS, Samal PK, Dhyani PP, Sharma S, et al. (2002) Faunal diversity and threats of the Dibru-Saikhowa biosphere reserve: A study from Assam, India. *Int J Conserv Sci* 7: 523-532.
9. Gogoi S, Chetia A, Baruah B (2022) December baghjan fire: A case study of the '2020 Assam gas and oil leak at Baghjan oil field, Tinsukia, Assam. *World Cong Disast Manag* 12: 483-497.
10. Farheen KS, Reyes NJDG, Jeon MS, Kim LH (2022) The status of Ramsar wetlands in India: A review of ecosystem benefits, threats, and management strategies. *J Wet Res* 24: 123-141.
11. Bhatta LD, Chaudhary S, Pandit A, Baral H, Das PJ, et al. (2016) Ecosystem service changes and livelihood impacts in the maguri-motapung wetlands of assam, India. *Land* 5: 15.
12. Mandal J, Abraham LM, Bhaduri R (2020) A note on the temporal and spatial distribution of asian woollyneck in Assam, India. *SIS Conserv* 2: 62-67.