Microbial Analysis of Wet Land Soil of Sikanderpur Lake at Muzaffarpur

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Abstract – The present survey was performed in a town wetland called Sikandarpur Lake in the north west of the city of Muzaffarpur, a metropolis in Bihar. The L-shaped Lake of Sikandarpur (Wetland) is the city's largest watercourse. It is a 'living lake' as it connects to the Budhi Gandak River by a pipe. The surface is an average of 60 hectares and the length of the shore lane is 8.1 km. This wetland sits in the centre of an immense farming scenery, over which urbanisation in the town took over. The Municipality of Muzaffarpur is responsible for its care and competence in this wetland. The lake maintains a resource-based integrated practise combining farming and aquaculture which supports the livelihoods of a large, economically deprived population of thousands of lake-dependent families, mainly fish and vegetables. The lake is currently under pressure from various anthropurgical activities in the area, including water diversion, land use modifications, waste water discharges and dumping. It has been one of the most common and rich places in the surrounding area in the past, although aesthetic beauty has deteriorated due to the recent development and population growth. The lake has many environmental problems, eutrophication included. All the bodies of water, including this lake, in the city have the most sewage and are poorly managed and attract the most humane intervention. The lake now includes about 6 drainage points, one of the main causes for water depletion. Adequate guidelines for implementing successful monitoring systems with the involvement of appropriate management policy must be established to reduce the current rate of degradation of wetlands. A analysis of the wetlands in the city of Muzaffarpur identifies a range of main issues and offers appropriate management requirements for the sustainable use of wetlands.

Key Words: Wet Land Soil, Sikanderpur Lake, Muzaffarpur, Population Growth.

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INTRODUCTION

Sikandarpur Lake is surrounded by a mix of urban and market forms, localities and stakeholders. This is a diverse need for products and consumption patterns. The present inquiry was materialized in the following steps in the light of all the above points. Customized questionnaires and check listing of the services given in Muzaffarpur City by Sikandarpur Lake have been carried out with regard to location and stakeholders, taking into consideration the source of economics in the region. The survey was carried out in the surrounding areas of the humidity. On the banks of Lake Sikandarpur there are over 21 large and small residential, commercial and industrial areas. The research has been carried out on the picking by random means of three areas, which in the local language are usually called 'Muhalla.' The three areas selected for the research are given in table 1.

Table 1: Areas selected for the survey adjoining the Sikandarpur Urban Wetland, Muzaffarpur

Sl. No.	Area Name	Description
A.	Jogiamath	Primarily residential with low income population
B.	Juran Chhapra	Primarily commercial for being the biggest medical/health hub in the North Bihar
C.	Karbala Mohalla	Little industrial cum residential area with low to medium income group population

Fig 1 (A): Sikandarpur Lake, Muzaffarpur in 1995

Fig 1 (B): Sikandarpur Lake, Muzaffarpur in 2015

Different facilities would be important in the evaluation process in conjunction with the evaluation goal, stakeholders and related interests, the ecological and socio-economic climate. The first move was to create a checklist of the principal economic and environmental services to be provided by wetlands. A questionnaire was subsequently tailored and survey was performed for the services based on the goods / need and the pattern of use. This offered a simple picture of using wetlands for products from current wetlands. All parties concerned were randomly chosen from three separate locations, and in the month of May-July, the survey was carried out. The survey was conducted between 07:00 and 17:00 and lasted 90 days. In all, 75 participants gave a view on the lake's ES and on ecological management views. Earlier work on the technique was pursued. For the management of wetland as a post-hoc exercise, a list of conservation matters and recommendations was prepared. The wetland is evaluated on the basis of the survey report and the control list has, as needed in the local scenario, been finalized with minor and evident adjustments. The proposals for improved wetland planning and development are expressed in order to ensure the flow of goods and services, which guarantee both survival and protection.

Wetlands conservation:

Aquatic habitat degradation and damage is followed by degradation of essential environmental and human-related facilities. In order to assess the current status and develop strategies for ecological restauration, quality assessments of the selected water system were undertaken in Muzaffarpur District. Adequate framework for the ecological recovery of the physical , chemical and biological integrity of wetland habitats shall be enforced and safeguarded. Conservation and management will also require a thorough investigation of the correction and evaluation of socio-economic aspects (wetland valuations) of non-point sources of pollution (NPS) issues. A pilot study was carried out in this context with the help of a planned questionnaire on the socio-economic aspects of wetland in Sikandarpur Lake, Muzaffarpur. The study near the lake revealed that around 90% of the residents surveyed depended directly on the groundwaters (borewell and wells) for bathing and washing, and around 60% depended on

the lake on alternative days. The survey also showed that a small proportion of residents (about 35-40%) rely on drinks, cooking purposes and approximately 20% on fodder (water hyacinth). For their livelihood, many families relied on fish. The public in this area also dealt with the degree of contamination of the lake as water quality declined. Every consecutive year, the local people were also conserved by the decreasing numbers of migratory birds. This has not only influenced human health but also resulted in a declining flora and fauna (birds and fish).

The protection of established functions in a Wetland is extremely difficult as the protection of changes in humans affecting natural forces such as hydrology, climate, biogeochemical fluxes and species movement that form and maintain a Wetland. The protection of wetland Some of the practices that affect the functioning of wetland areas are in urban settings, including broken road wetlands, on-road vehicles, impacts on neighbouring properties, soil compaction, increased irrigation, waste loading on domesticated animals, pest control, scenarios and solid waste disposal. These can be broadly summarized as:

- Hydrologic alterations: includes direct surface drainage by ditch-digging, de-watering by consumptive use of surface water inflows, through draw down of unconfined aquifer from either groundwater withdrawal or stream channelization.

- Increased sediment, nutrient, organic matter metals, infectious agent and different water waste material loadings from storm water runoff and effluent discharges.

- Changes to the physical characteristics of inflows, affecting the chemical parameters like dissolved oxygen, clarity, and pH scale resulting from a range of activities.

- Atmospheric deposition of pollutants.

- Introduction of exotic plant and animal species.

- Loss of sensitive wetland plant and animal species because of changes in adjacent land uses.

- Loss of close habitat for wetland-dependent species that additionally needs upland surroundings.

- "Edge effect" changes in plant and animal species because of changes in light-weight, temperature, and wet regimes, and from noise, pesticide drift.

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Wetland protection:

Wetlands are largely untreated in Muzaffarpur City and elsewhere from many developed urban and farmlands. They are shielded from such inputs by water quality requirements for wetlands. They are well handled calls. It is also important that long-term security and enhancement strategies are developed and implemented. Physical buffers, which minimise the edge effects and mitigate impacts on these habitats, are an established core element of the security strategy.

Sikandarpur Lake Wetland, Muzaffarpur profile

Since the research portion focuses mainly on the status, significance, dependence on resources and the role of the local population in the city's urban wetland, where the Sikandarpur Lake of Muzaffarpur City has been chosen for a thorough field study. There are almost 20 areas of the wetland that are referred to as Mohallas (hereafter the area) in the local language, including the nearby housing, business and industries. 15 % of the total household, which turns out to be three Mohallas, was surveyed for random sampling. 10 % of the total household was chosen for the survey using the random sampling approach in these three Mohallas.
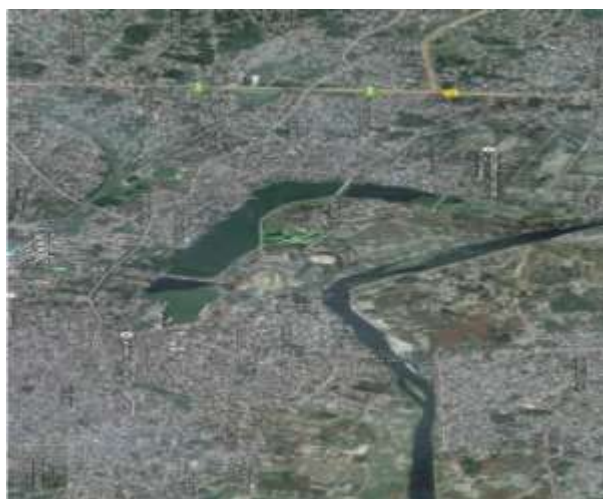
Fig. 2: Satellite Image of SikandarpurLake in Muzaffarpur City

Wetlands provide ecosystem services depending on their biogeochemical process, floral and faunal components and the environmental and anthropogenic factors surrounding them, and thus services differ with every wetland. Interactions between and within these components allow wetlands to perform functions that are directly or indirectly valuable for human well-being. These roles are known, but in the Indian scenario they were not efficiently listed and assessed. Finlayson et al. specified the loss of around half the wetlands of the planet. India has lost an estimated 38% of wetlands, and in some districts the rate is up to 88% and thus the current knowledge base on wetland resources

will be assisted by ecological details, socio-culturel practises and their economical valuation. Examination of Wetland' contribution to social and environmental welfare involves five major concerns:

i) Reliance on resources,

ii) Livelihood dependence on Wetland,

iii) Agricultural and aquaculture activities,

iv) Domestic and industrial needs of water from current ecosystem, and

v) Benefits beyond the Wetland resources such as regulating, supporting and cultural services.

Fig 3: A sad state of the Wetland bank, Sikandarpur Lake, Muzaffarpur

Ecosystem services (ES) and economic evaluation (EV) of wetlands being a relatively new concept in India; Wetlands are yet to witness such kind assessments. The present survey revealed that more than 71% of respondents recognized the contribution of the Sikandarpur Lake in their social upliftment and livelihood security. This is contrary to the findings by Lannas and Turpie in South Africa, where an urban wetland used by only 13% of households as compared with 65% in rural areas. However, the Sikandarpur Lake was found to make a 'major contribution' to social welfare, because of its several agricultural and non-agricultural benefits to the surrounding communities.

Photo Plate of Sikandarpur Lake Wetland which is surrounded by the Muzaffarpur City in its entirety

Plate 1

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Plate 2

Plate 3

Plate 4

Plate 5

Plate 6

Photo Plates having Snapshots taken by the researcher from different sides of Sikandarpur Lake which is surrounded by the Muzaffarpur City and thus making it as one of an important urban Wetland of Bihar.

CONCLUSION

The higher level of dependency on Sikandarpur wetlands and its poor quality calls for an immediate restoration of this degraded lake and appropriate measures for conservation and management in order to maintain ecological balance, not only in the Muzaffarpur City but in the region at large. Various policy measures including the creation of District Conservation Board and People's Action Groups represented by network of education institution, researchers, NGO's are suggested in this regard to restore this already degraded and dying urban wetland.

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