

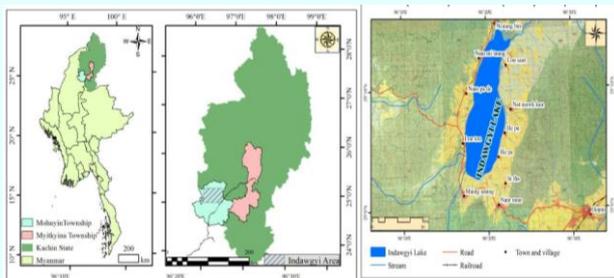


Abstract : Water quality assessment was carried out at Indawgyi Lake, the biggest lake of Myanmar. The main aim of this research is to evaluate the current status of lake water quality affected by the surroundings and man-made activities for three seasons (cold, hot and rainy) in 2019. Some physicochemical properties such as temperature, pH, ORP, EC, NTU, TDS and DO of surface and deep water samples from each point and totally four different points were analyzed in situ by water quality monitor U-53-G(Horiba). The concentrations of Cr, Mn, Fe, Cu, As and Hg were also examined by atomic absorption spectrometer (AAS) and total hardness, total alkalinity, salinity and chloride were measured by their respective methods. Nitrate and phosphate were detected by LaMotte, SMART 3 colorimeter. The condition of chemical oxygen demand (COD) and biological oxygen demand (BOD) of the lake water were also investigated by standard incubating methods. In addition, counting of coliform was performed to detect pathogenic microorganisms of lake water. The resulting values were compared with the standard limits of World Health Organization (WHO) and it was concluded that the lake was urgently needed to sustain the long-life existence and its water qualities due to the findings of some physicochemical, biological, toxic and pathogenic effects especially produced from the domestic sewage, mining and agricultural waste with fluctuations and above the guideline limits.

INTRODUCTION

Indawgyi lake is not only the largest lake of Myanmar but also one of the largest inland lakes in Southeast Asia. It is situated in Mohnyin Township, Kachin State of Myanmar. Its measures are 13 km long from east to west, and 24 km wide from north to south. Lake water flow from the south to the north and only one water outlet of the lake, Indaw chaung is at the northeast of the lake. There are 38 villages around the lake and some villages are on the bank of the lake. Ethnic groups living in the surrounding villages of the lake are mostly the Red Shan and the Kachin and their main works are agriculture, fishing and mining. They grow rice, orange, mustard, pineapple and dog-fruit. It has 546 feet (166 m) above the sea level and it is the main part of the Indawgyi Lake Wildlife Sanctuary.

Highest water level for rainy season was 65-70 feet, for winter season was 50-60 feet and for summer season was over 50 feet respectively. Medium water level of the lake was 25-60 feet and the lowest level was 5-7 feet. There are over 400 species of birds and 109 species of water birds in the surrounding of the lake and 93 species of fishes and shrimp in the lake. It stands as the source of income for over 50,000 people and has a great diversity of mammals, water birds, birds, fishes and shrimps. The lake is surrounded by many villages, inflowing streams, creeks, wetland area, paddy fields and a forested watershed and now it is increasing many pollution issues. It was declared as Biosphere reserve by UNESCO in 2017. Sustaining biodiversity and cultural values of Indawgyi lake and its surrounding landscape, the Biosphere Reserve will become a model region for integrating biodiversity conservation and sustainable development. This research was done to determine the quality of Indawgyi lake water as short term one year assessment in 2019. Seasonal sampling date were January 13 (as cold season), May 1 (as hot season) and July 25 (as rainy season) in 2019.



Map of the Indawgyi Lake, Mohnyin Township, Kachin State, Myanmar

METHODOLOGY



Sampling site-1 (Near Nyaung bin Village)



Sampling site-2 (Near Nantmee laung Village)



Sampling site-3 (Near Center of the Lake)

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Sampling site-4 (Near Mamon kaing Village)



Deep water sampler



Water quality monitor U-53-G (Horiba), (Trace20-HM 2000, Nanova)



LaMotte, SMART 3, colorimeter and 3653-SC

AAS – for some metals and heavy metal measurements

RESULTS AND DISCUSSION

Eutrophication Potential of the Lake Water

| | Season | NO ₃ ⁻¹ (mg/l) | PO ₄ ⁻³ (mg/l) |
|-----------|--------|--------------------------------------|--------------------------------------|
| Site-1 | Cold | 0.62 | 0.08 |
| | Hot | 0.42 | 0.03 |
| | Rainy | 0.00 | 0.03 |
| Site-1(a) | Cold | 0.51 | 0.09 |
| | Hot | 0.60 | 0.07 |
| | Rainy | 0.00 | 0.03 |
| Site-2 | Cold | 0.48 | 0.06 |
| | Hot | 0.08 | 0.05 |
| | Rainy | 0.10 | 0.03 |
| Site-2(a) | Cold | 0.23 | 0.08 |
| | Hot | 0.20 | 0.11 |
| | Rainy | 0.11 | 0.03 |
| Site-3 | Cold | 0.15 | 0.09 |
| | Hot | 0.24 | 0.00 |
| | Rainy | 0.03 | 0.50 |
| Site-3(a) | Cold | 0.33 | 0.01 |
| | Hot | 0.12 | 0.03 |
| | Rainy | 0.03 | 0.5 |
| Site-4 | Cold | 0.40 | 0.08 |
| | Hot | 0.12 | 0.14 |
| | Rainy | 0.14 | 0.13 |
| Site-4(a) | Cold | 0.31 | 0.15 |
| | Hot | 0.07 | 0.08 |
| | Rainy | 0.15 | 0.13 |



-Direct latrine, detergents, blue green algae, plant nutrients, fertilizers and mining wastes can cause the adverse effect on the water quality and lead to the sedimentation and eutrophication of the lake.

REFERENCES

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