ANALYSIS OF WATER FROM INDAWGYI LAKE IN MOHNYIN TOWNSHIP (KACHIN STATE)

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Abstract

- In this research work, chemical investigations have been made to assess the quality of water from Indawgyi Lake in Mohnyin township (November, 2015). Analyses have been made in three selected areas: near Shwemyitzu pagoda, Lowemon village and Loneton village, respectively. The experimental works have been done in three portions, physical examination, determination of chemical constituents and bacteriological analysis.

- Most parameters (except bacteria results) were in conformity with the WHO guide-line limits for drinking water. Bacteriologial examination also shows that all samples were unsatisfactory for drinking purpose due to the presence of *E.coli*. Comparative studies were performed between 2001 and 2015.

INTRODUCTION

- Water in its liquid form is the material that makes life possible at least 60 % water.
- Organism can exist only where access to adequate supplies of water.
- These abilities make water extremely valuable for society and industrial activities.

- Indawgyi Lake is located in Mohnyin Township , Kachin State of northern Myanmar.
- It is the largest inland lake of Myanmar. It lies between the North Latitudes of 25° 2' and 25° 16' and between the East Longitudes of 96°17 ' 30" and 96° 22' 30".
- It was a length of about 24.08 km from north to south and a width of about 7.73 km from east to west and the total area of about 97.66 km^2 .

- The area of the lake is variable by seasonal changes.
- The whole lake lies under 170 m above sea level .
- The lake is surrounded by mountains expect from north eastern portion.
- Indaw creek is the only outlet of Indawgyi Lake and flow out to Hpakant Township on the north and enters to Mogaung creek.
- Many streams flow into the Indawgyi Lake

- When Indawgyi Lake water was analyzed in 2001, it was found that the water is generally should be used for drinking water.
- Eleven village tracts with over 60,000 persons of population are included in Indawgyi area.
- Gradually increased population and extended economic activitices enhance the degradation of environment.
- That is why the water quality of Indawgyi Lake may be threatened by various source of pollution.
- So the main aim of this research is “whether the water quality of Indawgyi Lake is polluted or not".

Aim and Objectives

- The main aim is to compare the water quality of Indawgyi Lake between 2001 and 2015.
- To collect the samples
- To characterize the physical parameters
- To determine the amount of heavy toxic metals by AAS (atomic absorption spectroscopy)
- To determine the chemical consitituents. (Mandalay City Development Committee, Water And Sanitation Department, Water Laboratory)
- To determine the Bacteriological analysis of water(Public Health Laboratory Mandalay)

Sample collection

- three selected areas
- (1) 3 feet in depth, median line of lake, in near the Shwemyitzu pagoda
- (2) 3 feet in depth, 30 yards distance from the bank, in Lowemon village
- (3) 3 feet in depth, 30 yards distance from the bank, in Loneton village

Figure 1. Location of sample collection

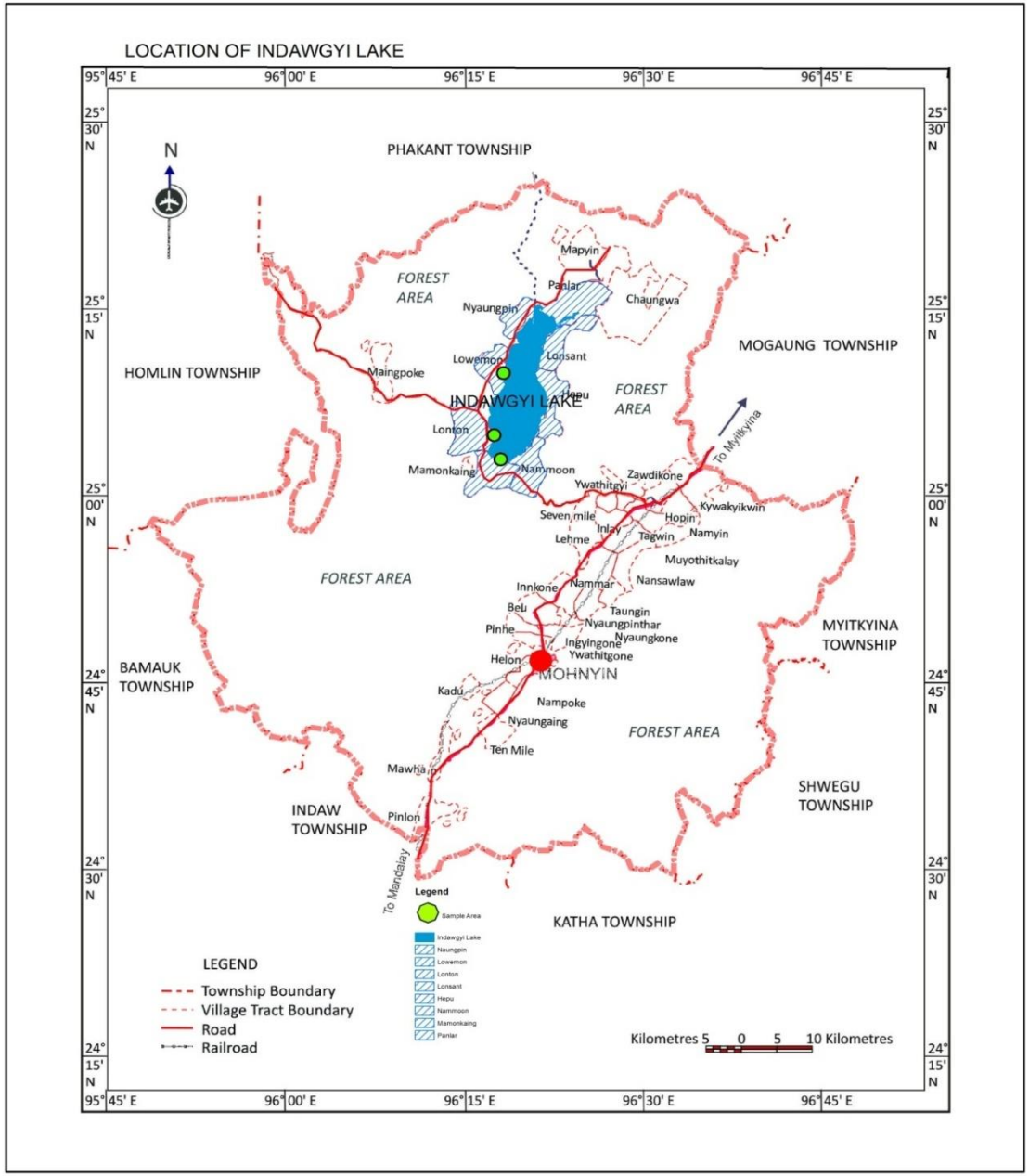

Figure 2

Shwemyitzu Pagoda

Indawgyi Lake

Figure 3
Indawgyi Lake and environs

RESULTS AND DISCUSSIONS

Physical parameters

- pH (6.8)
- Color
- Conductivity
- Turbidity
- TDS and TSS

not beyond the maximum acceptable limit.

Attractive Appearance

Physical Properties

Parameters 23-11-2015	2015 sample1	2001 sample1	2015 sample 2	2001 sample 2	2015 sample 3	2001 sample 3	WHO standard	
							Desirable	imperative
pH (scale)	6.8	7.1	6.8	7.2	6.8	6.9	7-8.5	6.5-9.2
Color (units)	5	<5	5	<5	5	<5	5	50
Turbidity (N.T.U)	1.8	<5	1.75	<5	4.15	<5	5	25
Conductivity (μ mhos/cm)	112.7	200	84.3	150	84.6	145	100	400
Total Dissolved Solids (mg/L)	59.6	119.9	44.4	114.8	44.6	114.8	500	1500
Total Suspended Solids (mg/L)	1	2.3	8	5.6	2	3.5	-	-

Chemical Parameters

- **Calcium**
- **Magnesium**
- **Total Hardness**
- **Total Alkalinity**
- **Iron**
- **Manganese**
- **Chloride**
- **Sulphate**
- **Nitrogen Nitrate**
- **DO**
- **BOD**

Chemical Properties

Parameters	2015 sample1	2001 sample1	2015 sample 2	2001 sample 2	2015 sample 3	2001 sample 3	WHO standard	
							Desirable	imperative
Calcium as Ca (mg/L)	16	24	8	16	10	16	75	200
Total Hardness as $CaCO_3$ (mg/L)	68	130	60	90	52	90	100	500
Mgnesium Mg (mg/L)	5	7.2	10	4.8	6	4.8	50	150
Chloride as Cl (mg/L)	8	20	5	20	8	20	200	600
Total Alkalinity as (mg/L) $CaCO_3$	80	160	68	185	60	190	200	500
Total iron as Fe (mg/L)	0.01	0.011	0.01	0.01	0.01	0.01	0.1	1.0
Manganese as Mn (mg/L)	0.01	ND	0.01	ND	0.01	ND	0.05	0.5
Sulphate as SO_4 (mg/L)	< 200	99	< 200	101	< 200	109	200	400
Nitrogen nitrate ($N\text{-}NO_3$) (mg/L)	8.8	2.9	8.8	2.9	8.8	2.1	-	45
Dissolved oxygen (DO) (mg/L)	4.18	4.86	5.21	3.80	1.67	3.75	-	5
Oxygen demands, Biochemical (mg/L)	9.5	ND	8.1	ND	13	ND	-	2

Bacteriological Analysis

Parameters	2015 sample1	2001 sample1	2015 sample 2	2001 sample 2	2015 sample 3	2001 sample 3
Total Coliform Test	5/5	5/5	5/5	5/5	5/5	5/5
E.coli	Isolated	Isolated	Isolated	Isolated	Isolated	Isolated
Remark	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory	Unsatisfactory

The Result of Toxic Metals

Parameters	2015 sample 1	2001 sample1	2015 sample2	2001 sample2	2015 sample 3	2001 sample 3	WHO standard	
							Desirable	imperative
Arsenic (As)	Nil	Nil	Nil	Nil	Nil	Nil	-	0.05
Copper (Cu)	Nil	Nil	Nil	Nil	Nil	Nil	1.0	2.0
Cyanide (CN)	Nil	Nil	Nil	Nil	Nil	Nil	-	0.07
Lead (Pb)	-	-	-	-	-	-	-	0.01

Comparative analysis

- from the results of 2001 and 2015
- it was found that, although all parameters of properties were slightly changed
- the water quality of Indawgyi Lake was fit according to WHO standard
- it was suitable for drinking, domestic use, agricultural use and industrial use
- It can be concluded that the water quality of Indawgyi Lake is not polluted.

CONCLUSION

- The quality of water from Indawgyi Lake is generally enough for drinking purpose.
- The water is physically clear and colorless.
- It was found that the physical properties such as pH, color, turbidity, conductivity, total dissolved solids and total suspended solids of three water samples were conformity with WHO desirable limit.

Chemical parameter such as:

- Ca, Mg, Fe, Mn, total hardness, total alkalinity, Chloride, Sulphate ,N-NO_3

  (do not exceed the standard limits)

  (does not polluted)

Heavy Metal: As, Cu, CN, Pb (not detected)

- Indawgyi Lake water may not be injurious to health and there may occur no migration of toxic metals.

- According to **bacteriological examination** of water by the Public Health Laboratory Mandalay,

  E .coli was isolated.

- unsatisfactory remark .

- According to **comparative analysis** from the results of 2001 and 2015,
- Although all parameters of properties were slightly changed, it can be concluded that the water quality of Indawgyi Lake is not significantly changed by the environment.
- The water quality of Indawgyi Lake was fit according to WHO standard and
- it was suitable for domestic use, agricultural use and industrial use.

Suggestion

- It should be used for drinking water only after proper treatment because *E.coli* was isolated in the water.
- Systematic land utilization will be required and conservation of natural environment was essential to maintain the water quality of Indawgyi Lake


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