

2 METHODS and MATERIALS

2.1 Materials

Sterilized glass bottles and plastic containers were purchased from Public Health Laboratory of Mandalay under Ministry of Health and Sports. EDTA, EBT and some required chemicals were purchased from Abel chemical company, Myanmar.\

2.1.1 Sample Collection

Water samples were collected in three seasons where two samples from Ayeyarwaddy river and other two samples from Tank (2) and Tank (3) of Vippassala Monastery, Maha Ghandayon Chaung, Sagaing Hill in Myanmar. Each sample was collected in three seasons such as summer, rainy and winter season.



Figure (1) Collecting water samples in Tank (2) and Tank (3)



Figure (2) photo of Tank (3)

2.2 METHODS

2.2.1 Analysis of Physical Properties of Water Collected from Ayeyarwady River and Monastery

2.2.1.1 Estimation of Colour

Method : APHA platinum cobalt standard method

The colour of the collected water sample was estimated by APHA platinum cobalt standard method (APHA 18th Edt, 1992).

2.2.1.2 Estimation of pH Value

Method : Direct Measurement by pH meter

The pH of water was determined by using a pH meter (AOAC, 2000).

2.2.1.3 Estimation of pH Value

Method : Direct Measurement by pH meter

The pH of water was determined by using a pH meter (AOAC, 2000).

3 RESULTS AND DISCUSSION

3.1 Determination of Physicochemical Parameters of Collected Water Sample from Ayeyarwaddy River and Monastery in summer

No	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Maximum value	unit
1	Appearance	Slightly Turbid	Slightly Turbid	Clear	Clear		
2	Colour	6	6	5	5	50	Units
3	pH value	7.4	7.3	7.2	7.3	6.5 to 9.2	
4	Total Solids	307	277	262	346	1500	mg/L
5	Total Hardness	50	80	20	40	500	mg/L
6	Total Alkalinity	195	130	130	130	950	mg/L
7	Calcium	12	20	8	8	200	mg/L
8	Magnesium	5	7	0	5	150	mg/L
9	Chloride	20	20	20	20	600	mg/L
10	Sulphate	20	49	39	118	400	mg/L
11	Total Iron	Nil	Nil	Nil	Nil	1	mg/L

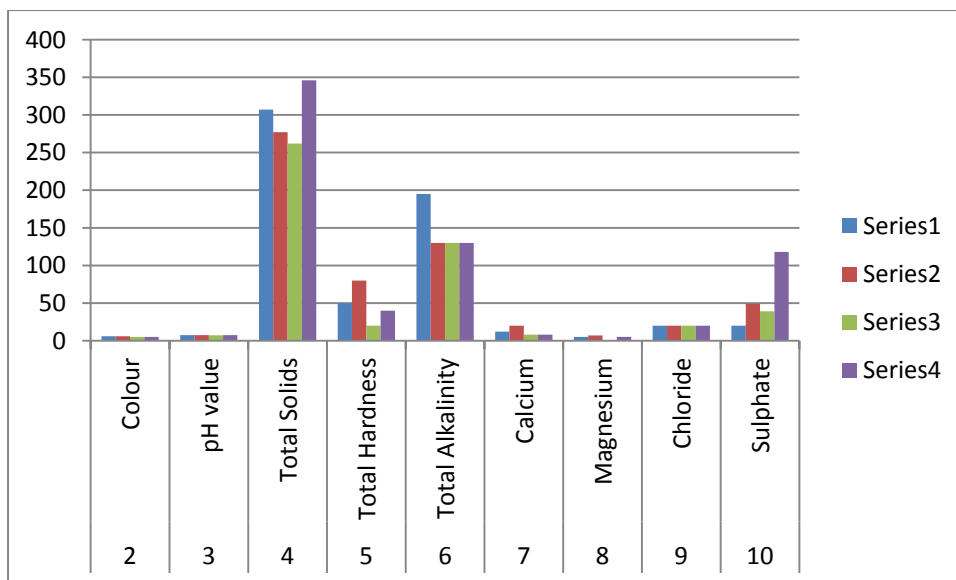


Figure (3) Comparative graph for sample 1,2,3 and 4 in summer

According to above comparison, sample 1 has highest amount of total solids and sample 4 has highest amount of total alkalinity and sulphate contents in summer.

3.2 Determination of Physicochemical Parameters of Collected Water Sample from Ayeyarwaddy River and Monastery in rainy season

No	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Maximum value	unit
1	Appearance	Turbid	Turbid	Clear	Clear		
2	Colour	12	10	5	5	50	Units
3	pH value	7.1	7.6	7.2	7.3	6.5 to 9.2	
4	Total Solids	257	267	262	346	1500	mg/L
5	Total Hardness	40	40	20	40	500	mg/L
6	Total Alkalinity	130	130	130	130	950	mg/L
7	Calcium	8	8	8	8	200	mg/L
8	Magnesium	5	5	0	5	150	mg/L
9	Chloride	20	20	20	20	600	mg/L

10	Sulphate	39	39	39	118	400	mg/L
11	Total Iron	Nil	Nil	Nil	Nil	1	mg/L

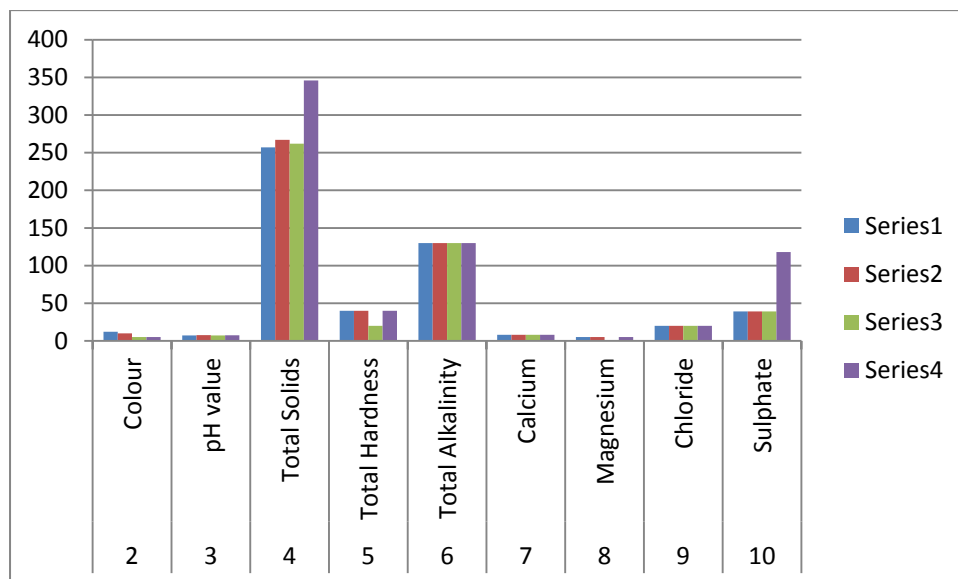


Figure (4) Comparative graph for sample 1, 2, 3 and 4 in rainy season

According to above comparison, sample 2 has second highest amount of total solids and sample 4 has highest amount of total solids and sulphate contents in summer.

3.3 Determination of Physicochemical Parameters of Collected Water Sample from Ayeyarwaddy River and Monastery in winter season

No	Parameters	Sample 1	Sample 2	Sample 3	Sample 4	Maximum value	unit
1	Appearance	Turbid	Turbid	Clear	Clear		
2	Colour	12	10	5	5	50	Units
3	pH value	7.1	7.6	7.2	7.3	6.5 to 9.2	
4	Total	257	267	262	346	1500	mg/L

	Solids						
5	Total Hardness	40	40	20	40	500	mg/L
6	Total Alkalinity	130	130	130	130	950	mg/L
7	Calcium	8	8	8	8	200	mg/L
8	Magnesium	5	5	0	5	150	mg/L
9	Chloride	20	20	20	20	600	mg/L
10	Sulphate	39	39	39	118	400	mg/L
11	Total Iron	Nil	Nil	Nil	Nil	1	mg/L

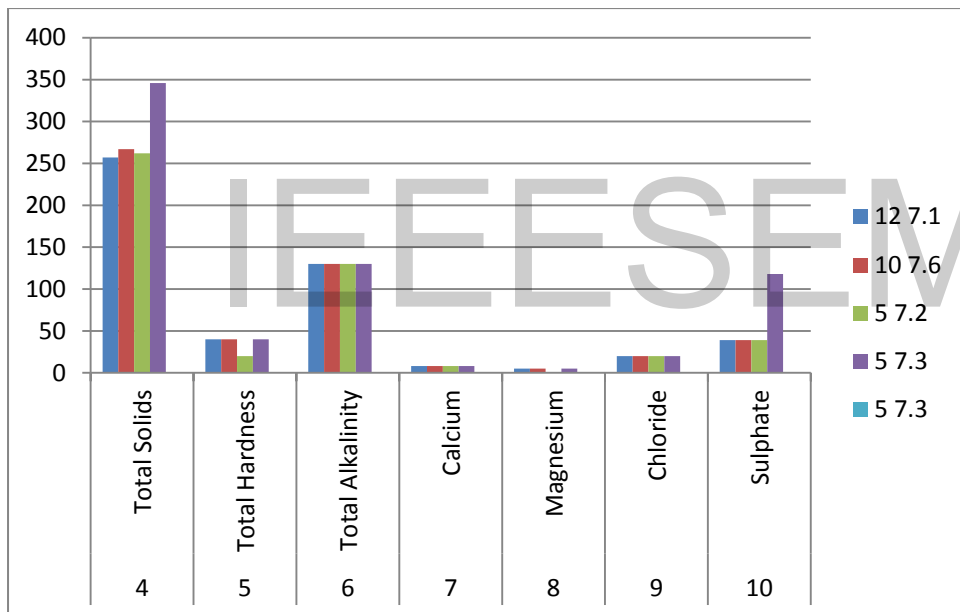


Figure (5) Comparative graph for sample 1,2,3 and 4 in winter season

According to above comparison, sample 2 has second highest amount of total solids and sample 4 has highest amount of total solids and sulphate contents in summer.

3.4 Water Bacteriological Examination

bacteria	Sample 1	Sample 2	Sample 3	Sample 4
Probable Coliform Count	5/5	5/5	5/5	5/5
Escherichia coil Count	Isolated	Isolated	Isolated	Isolated

according to bacteriological result, all selected water samples from Ayeyarwaddy river ,Tank (2) and Tank (3) contain two types of bacteria that are danger for human health.

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3.5 BOD and COD Parameters of Ayeyarwaddy River

Table (5) BOD and COD Parameters of Ayeyarwaddy River

Sr.	Quality parameter	Results	Method	Drinking standard	Effluent standard	Remarks
1	BOD	9 mg/L	Estimated by Ecolab with Jenway Dissolved OxygenMeter (Model-970)	≤ 3 mg/L	≤ 50 mg/L	Above DW limit
2	COD	< 30 mg/L	Lovibond SpectroDirect Method No. 130, 131, 132	NG	≤ 250 mg/L	Normal

According to BOD and COD parameters determination, high amount of BOD parameters display that Ayeyarwaddy is beyond the drinking water standard parameter and so water sources are unfit for drinking and danger for aquatic lifes.

4 CONCLUSION

According to this research work, the physicochemical parameters of each selected water sample such as colour, turbidity, total solids, total hardness, total alkalinity, calcium content, magnesium content, chloride and sulphate contents were determined in three seasons in which sample 4 has the high contents of TDS (346 mg/L), Total alkalinity (130 mg/L), Total hardness (40 mg/L) and sulphate (118 mg/L). Moreover, the bacteriological results point out all of water samples have two bacteria groups such as Probable Coliform Count and Escherichia coil Count showing that how many human facial wastes are present in those water resources and these bacteria can cause diarrhea. Studying on water resources supplied from Ayeyarwaddy river to Tank (2) and Tank (3) in monastery are unsuitable for direct drinking and domestic usages. Furthermore, the BOD parameters of river water is 9 mg/L that is very high compared with the maximum permissible level pointing that the water quality is severe for aguatic animals in this river. Health care is necessary for water resources of monastery in Sagaing Hill.

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