

Table I. : Physico-chemical parameters of Kondakarla Lake.

Sl. No.	Parameters	Kondakarla Village	Haripalem Village	Vadrepalle Village	Tolerance limits (max.)
1.	pH	8.55	8.5	8.6	6.0–8.5
2.	Electric conductivity (Micro mhos/cm)	1450	1320	990	2250
3.	Carbonates (m.eq./L.)	0.8	0.6	1.0	–
4.	Bicarbonates "	5.2	4.2	3.6	–
5.	(Calcium + Magnesium) "	6.0	6.2	3.8	–
6.	Sodium "	8.48	7.04	6.08	–
7.	Potassium "	0.05	0.05	0.1	–
8.	Chloride "	7.0	5.2	4.0	17
9.	Sulphate "	1.4	2.8	1.0	21
10.	Nitrate "	0.13	0.11	0.23	–
11.	Residual Sodium Carbonate "	NIL	NIL	0.6	1.25
12.	Sodium Absorption Ratio –	4.9	4.0	4.41	26
13.	Percent Sodium –	58.36	52.97	60.92	60
14.	Water Quality –	C ₃ S ₁	C ₃ S ₁	C ₃ S ₁	–

m.eq = milli equivalents

The sodium hazard of irrigation waters is measured by the concentration of sodium to calcium and magnesium which is called Sodium Absorption Ratio (SAR). The SAR values in the present study floated from 4.0 to 4.9 and its tolerance limit is 26. The sodium hazard of irrigation waters as expressed by SAR does not take account the effect and anionic composition. The higher SAR values deteriorates the soil texture in irrigation waters. As per the Indian Standards (2296–1982) irrigation water with SAR less than 10 is classified as S_1 and accordingly Kondakarla lake water belongs to this class.

Residual Sodium Carbonate (RSC) during the survey was found 0.6 m.eq/lit. at Vadrepalle and absent in the other two places. According to Eaton (1950), waters with RSC greater than 2.5 m.eq/lit. may be regarded as deleterious while those with less than 1.25 m.eq/lit. are considered safe.

From the water samples the percent sodium ranged from 53 to 61 (rounded of to nearest fraction) and its maximum tolerance limit is 60.

Sulphates : Sensitivity of plants to high sulphate concentration is related to the tendency of high sulphate concentrations to limit the calcium uptake by plants.

The decrease in the uptake of the factor is associated with relative increases in the absorption of sodium and potassium. Sulphate quantity in the lake water during the survey ranged between 1.0 to 2.8 while its tolerance limit is 21.

CONCLUSION

The suitability of irrigation water has to be assessed on the basis of specific conditions like different agroclimatic conditions, different crops (sensitive, semitolerant, tolerant), its varieties and cultural practices. Due to differences in these conditions in different areas, one can treat the above guidelines for evaluating irrigation water quality.

As such the Kondakarla lake irrigation water has been classified as C_3S_1 on the basis of the electric conductivity (750–2250 micro mhos/cm) and SAR (less than 10). All the parameters of Kondakarla lake water are within the limits required for agricultural purpose and thus indicated its suitability for irrigation purposes.

SUMMARY

In order to assess the suitability of water quality for irrigation purposes at Kondakarla Lake which is forming one of the major wetlands in Visakhapatnam District of Andhra Pradesh, the author has collected its water samples and analysed the relevant parameters. The positive results obtained have been discussed in the light of its suitability.

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