Study of Suitability of Groundwater for Agricutural Purpose: Quality Assessment of Water From Adan River, Yavatmal District of Maharashtra.

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India is called as the country of Agriculture. Now a days irrigation has become very essential due to irregularity of rain. Hence it becomes important to study the groundwater quality and its suitability for agricultural use. In present study 6 places of Adan river basin were selected for sampling and water samples were collected and analysed after every one month from September 2013 to April 2014. The physico-chemical parameters like Turbidity, pH, EC, TDS, Hardness, Alkalinity, Ca, Mg, Na, K, SO_4^{-2}, Cl^- were analysed using standard methods.SAR was determined to study suitability of water for irrigation.Based on the results obtained it can be concluded that quality of water of Adan river is good for irrigation at every place of investigation.

Introduction:

Agricultural productivity is governed by the good quality land. Salinity of the soil is important factor. Irrigation is the need of today. The natural aquatic resources are causing heavy and varied pollution in aquatic environment leading to pollute water and depletion of aquatic biota. It is therefore necessary that the quality of water should be checked at regular time of interval. The present study involves the analysis of water described by the physical water quality in terms of physico-chemical parameters of Adan River, Yavatmal district region, Maharashtra, India. This river enters the Yavatmal district from Wishim district and it covers the area of Darwha taluka and Arni taluka. Water of this Adan river is used in these taluka for irrigation purpose.

Experimental:

The water samples of Adan river were collected from the different villages, namely Boriarab(Darwha taluka), Pathrat Devi(Darwha taluka), Uchegaon (Darwha Taluka), Mangrul (Arni taluka), Kurhad (Arni taluka), Koli (Arni taluka) after every one month from September 2013 to April 2014 during 10am to 11am. Properly washed polythene bottles were used for sample collection. Some water quality parameters were tested immediately on the collection place. The physico-chemical parameters like Turbidity, pH, EC, TDS, Hardness, Alkalinity, Ca, Mg, Na^+, K^+, SO_4^{-2}, Cl^- were analysed using standard methods.SAR was determined to study suitability of water for irrigation. Standard methods of analysis were adopted for physicochemical analysis. All the chemicals used were of AR grade. All the glasswares used were of A

class. Double distilled water was used throughout for preparation of reagents and solutions. Instrumental methods were adopted for turbidity, pH, conductance, Na, K.

The instruments used were-

1. Equip-Tronics digital pH-meter (model no. EQ.610)
2. Equip-Tronics digital conductivity meter (model no. EQ.660)
3. Equip-Tronics digital colorimeter (model no. EQ.650)
4. Esico digital flame photometer (model no. 381E)

Other parameters were analysed by titration method.

Results And Discussion:

Results obtained during the analysis have been tabulated in Table. The parameter values are reported by taking average from September 2013 to April 2014. Seasonal variation was mainly observed in parameters like EC, Hardness, and Alkalinity.

Parameter	S-I	S-II	S-III	S-IV	S-V	S-VI
Turbidity	6.8	7.2	7.6	7.3	7.8	6.9
pH	7.18	7.21	7.34	7.27	7.13	7.11
EC (µmho/cm^3)	295.3	309.8	318.6	312.4	289,5	285.7
TDS	511	497	523	495	504	517
Hardness (ppm)	283.2	278.6	307.5	304	301	298.7
Alkalinity (mg/L)	96.5	98.3	102.4	99.2	94.9	95.2
Ca (mg/L)	24.5	23.7	25.1	24.3	24.6	24.8
Mg (mg/L)	5.25	5.16	5.07	5.08	5.19	5.14
Na (mg/L)	63.4	62.6	61.7	64.7	67.5	64.7
K (mg/L)	7.15	7.04	6.46	6.93	7.34	7.26
SO_4^{-2} (mg/L)	83.2	79.4	81.5	84.7	88.5	87.4
Cl^- (mg/L)	47.8	51.4	48.4	49.3	52.7	51.7
SAR	12.17	12.21	11.73	12.49	12.94	12.37

The turbidity is the indicator of pollution. For Experimental samples, the values are in between 6.5 to 8.0, which are in well satisfaction. pH values indicate that the samples are alkaline in nature and are near to 7.0. EC and Hardness values are in accepTable range, indicate the suitability for irrigation. TDS and Alkalinity values are higher which may be due to domestic disposal in river water. The chloride content ranged between 47.7 to 52.8 mg/L. These values are well below the permissible level, both for drinking and arrigation purpose. Ca, Mg, Na, K are the essential metals for the proper growth of the plants. In the

present study the values of these parameters were in good agreement and their level was found in the required range. These are mainly due to the process of soil leaching. The SO_4^{-2} ranged 79.4 to 88.5 mg/L. which were in good range.

Conclusion:

From the results obtained in the present study it is concluded that the water of Adan River is suiTable for Agricultural purpose. If it is available on plenty, the problem of agricultural irrigation can be easily solved.

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