

A STUDY OF QUALITY OF WATER FOR IRRIGATION IN THE STREAM OF INDUSTRIAL BELT AREA OF MEDAK DIST, TELANGANA STATE

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Abstract : Water is used for many purposes like washing, bathing, drinking, thus it is one of the most important resources on the earth. Water pollution degrades quality of water and affects the organisms living in it. Water which is used for irrigation depends on chemical properties such as Total salt concentration, Sodium adsorption ratio, Residual sodium carbonate or bicarbonate ion concentration and boron content. This paper deals with the parameter sodium absorption ratio (SAR) of water in industrial areas of Medakdist during pre and post monsoon 2015 & 2016. Sterile bottles were used to collect the samples. Present study area is surrounded by industries. Thus contaminated by many organic and inorganic chemicals. Seven samples were collected and were also studied for different parameters like PH, tds, tss, and different electrolytic ions. Thus it was found that quality of water is not up to the mark for its consumption in domestic and irrigation purpose.

IndexTerms -: Water pollution, Water for irrigation, Sodium Adsorption Ratio

INTRODUCTION

Sodium adsorption ratio is an important parameter that helps to understand suitability of water for irrigation and to understand about the soils which are affected by sodium. It is also used as an indicator which gives information about suitability of soil for irrigation. If water used for irrigation contains more percentage of sodium the soil becomes more difficult for ploughing and become more unstable for seed emergence (Trivedy&Goel,1984)(Kranth,1987). Presence of sodium will enhance the exchange of sodium with calcium and magnesium.

As per the Bureau of INDIAN STANDARDS(SEPT 1987)(IS:11624-1986) the Water Quality ratings based on sodium adsorption ratio is given below.

S/No	Class	SAR RANGE
1	Low	Below 10
2	Medium	10-18
3	High	18-26
4	Very High	Above 26

As per INDIAN STANDARDS(SEPT 1987)(IS:11624-1986) and the NSW –Department of primary industries GOVT. SAR is an indicator which helps in finding the suitability of water for the use of agriculture .

$$SAR = \frac{Na^+}{\sqrt{1/2(Ca^{+2}+Mg^{+2})}}$$

SAR = Sodium adsorption ratio

Na⁺= Sodium ion concentration ,inmilli equivalence per liter

Ca²⁺ =Calcium ionconcentration ,inmilli equivalence per liter

Mg²⁺ = Magnesium ion concentration, in milli equivalence per liter

RESULTS

Table 1 :SURFACE WATERANALYSIS SODIUM , CALCIUM & MAGNESIUM ION OF"PRE MONSOON" 2015

S/NO	SAMPLE	Na + in Meq/l Pre mansoon 2015	Ca 2+ in Meq/l Pre mansoon 2015	Mg 2+ in Meq/l Pre mansoon 2015
1	KHAZIPALLY TANDA	188	60.6	26.3
2	MALLAMPET	140	56.4	24.5
3	GANDIGUEM	164	55.8	32.3
4	ASANIKUNTA	173	56.2	41.4
5	KISTAREDDY PET	187	46.5	31.7
6	PALMAVAGU	170	52.6	36.3
7	PEDDA VAGU	196	54.5	29.4
8	NAKKAVAGU	190	54.5	38.6

S/NO	SAMPLE	Na + in Meq/l postmansoon 2015	Ca 2+ in Meq/l Postmansoon 2015	Mg 2+ in Meq/l Post mansoon 2015
1	KHAZIPALLY TANDA	176	49.6	21.8
2	MALLAMPET	135	45.5	18.6
3	GANDIGUEM	152	44.3	27.2
4	ASANIKUNTA	168	46.7	36.2
5	KISTAREDDY PET	173	34.8	24.6
6	PALMAVAGU	154	41.4	30.1
7	PEDDA VAGU	193	42.6	26.5
8	NAKKAVAGU	181	41.9	33.1

S/NO	SAMPLE	Na + in Meq/l premansoon 2016	Ca 2+ in Meq/l Premansoon 2016	Mg 2+ in Meq/l Premansoon 2016
1	KHAZIPALLY TANDA	200	62.5	30
2	MALLAMPET	164	57.8	23.4
3	GANDIGUEM	175	60.5	35.5
4	ASANIKUNTA	185	64	45.5
5	KISTAREDDY PET	196	56.5	38.4
6	PALMAVAGU	188	60	40
7	PEDDA VAGU	200	60.4	35
8	NAKKAVAGU	200	58.6	40

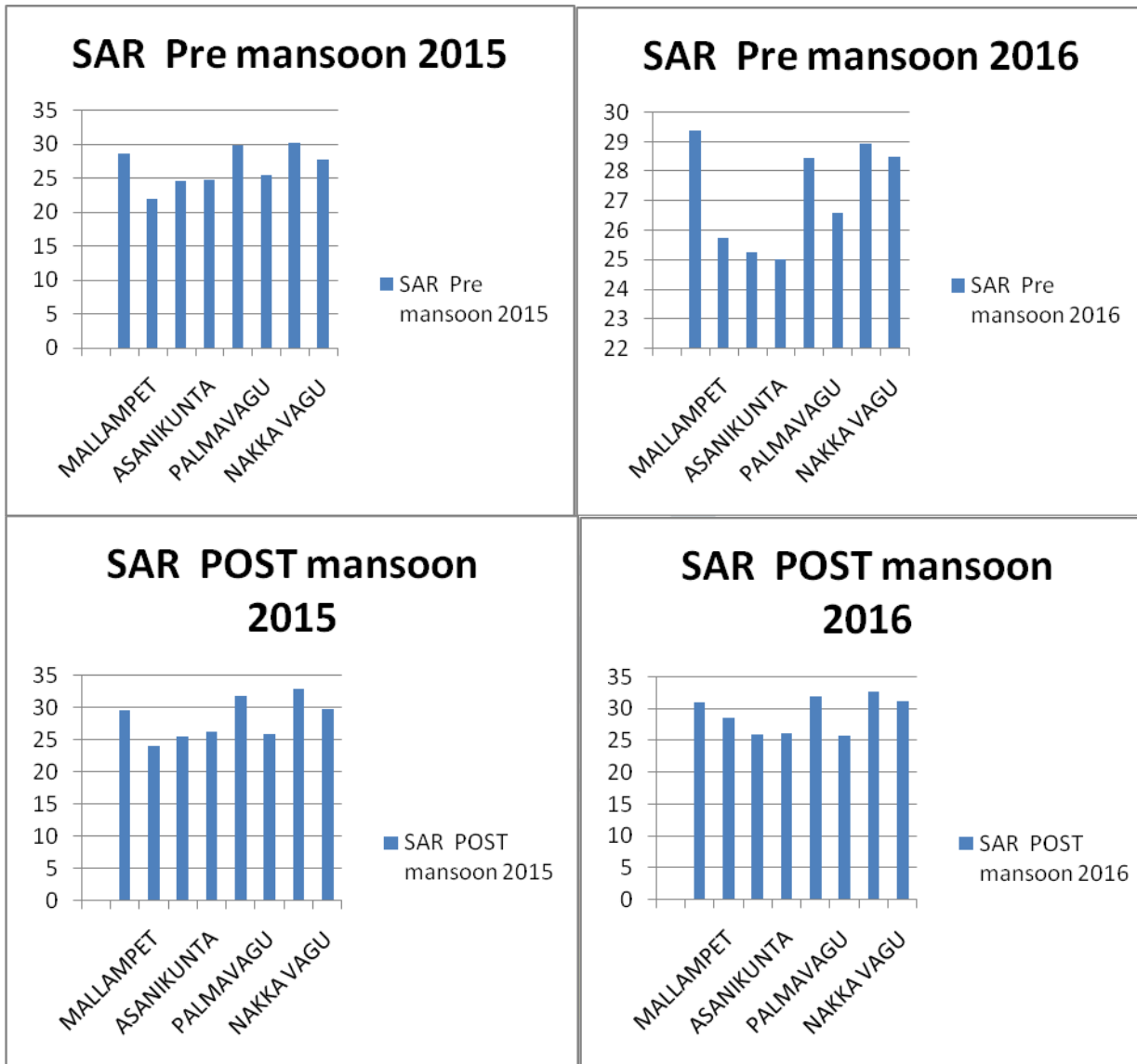
S/NO	SAMPLE	Na + in Meq/l post manson 2016	Ca 2+ in Meq/l Post manson 2016	Mg 2+ in Meq/l Post manson 2016
1	KHAZIPALLY TANDA	189	51.5	23.5
2	MALLAMPET	172	46	26.6
3	GANDIGUEM	166	52.4	29.4
4	ASANIKUNTA	174	50.6	38.5
5	KISTAREDDY PET	184	38.4	28.6
6	PALMAVAGU	164	46.5	34.5
7	PEDDA VAGU	200	46.5	28.5
8	NAKKAVAGU	195	43	35.4

TABLE SHOWING SAR- VALUES FOR PRE- POST MANSOON- 2015 & 2016

S/NO	SAMPLE	SAR Pre manson 2015	SAR POST manson 2015	SAR Pre manson 2016	SAR POST manson 2016
1	KHAZIPALLY TANDA	28.66973122	29.45632479	29.40858488	30.86357076
2	MALLAMPET	22.01246978	23.84623127	25.73835764	28.5479636
3	GANDIGUEM	24.70989453	25.4217571	25.25907428	25.95651809
4	ASANIKUNTA	24.76487796	26.09438191	25.002283	26.06906135
5	KISTAREDDY PET	29.90564873	31.74445523	28.45364855	31.79035806
6	PALMAVAGU	25.4984064	25.75625391	26.58721497	25.7701138
7	PEDDA VAGU	30.26147474	32.83471743	28.95814952	32.65986324
8	NAKKA VAGU	27.84798384	29.55717623	28.48436459	31.14523254

DISCUSSIONS AND GRAPHICAL REPRESENTATION OF SAR VALUES FOR PRE AND POST MONSOON 2015-16

SAR value of all the samples collected during pre-monsoon 2015 and pre monsoon is found to be in an increasing order. Over all the water is becoming contaminated. The SAR which are increasing shows that the water is not useful for the purpose of irrigation which is clearly seen in the graphical representation.



CONCLUSIONS

The study shows that the chemicals draining from the various industries have a very bad impact on the water which is used for agriculture. As per the guide lines of Bureau of INDIAN STANDARDS(SEPT 1987)(IS:11624-1986) If the Water Quality ratings based on sodium adsorption ratio is above "26" then the water is not suitable for agriculture. From the above table it is very clear that the SAR value is ranging from 22.0124 to 32.659 which is very high and the water is becoming not suitable for irrigation

The study also shows that there is an increase in SAR values in the two years as the values are in the increasing order.

The industrial pollutants had affected the lakes which should be monitored by at least twice a year.

The hazardous effect of SAR values should be Monitored and necessary steps should be taken such that the SAR value comes down below 10 or at least in the range 10-18

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