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Assessment of irrigation water quality collected from different sources and effect of seasonal variation in canning block, 24 south parganas, West Bengal

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Abstract

The present work aimed to classify the irrigation water quality of surface water (Pond) and groundwater (shallow), Collected from different sources and different seasons in Canning Block, 24 South Parganas, West Bengal. Thirty water samples were collected in Pre-monsoon and post- monsoon for analysis of physico - chemical parameters like pH, Electrical Conductivity (EC), Chloride (Cl^-), Carbonate (CO_3^{--}). Bicarbonate (HCO_3^{--}), Sulphate (SO_4^-), Calcium (Ca^{++}), magnesium (Mg^{++}), Sodium (Na^{++}), Potassium (K^+), Sodium adsorption ratio (SAR), Residual sodium carbonate (RSC) . Analysed water samples of shallow tube well were found in pre- monsoon rated as 73.33 % (C3-S1) under high salinity and 23.66% (C4-S1) under very high salinity water, but after post- monsoon were found of shallow tube well were 46.66% (C2-S1) water samples converted in under medium range and 53.33% (C3-S1) water under high range found. In respect of Pond water samples were found in pre monsoon 93.33% (C3-S1) samples under high salinity water and 6.66 % (C2-S1) under medium range. After post monsoon of pond samples found 73.33 % (C2-S1) in medium range and 26.66 % (C3-S1) in high range.

Highlights

- Water samples of shallow tube well were found in pre- monsoon rated as 73.33 % (C3-S1) under high salinity and 23.66% (C4-S1) under very high salinity water.
- After the monsoon shallow tube well water converted 46.66 % (C2-S1) in medium range and 53.33 % in high salinity range.
- Pond water samples in pre-monsoon were found 93.33 % (C3-S1) in high salinity range and 6.66% (C2-S1) in Medium range.
- After monsoon Pond water samples were found 73.33 % (C2-S1) in Medium range and 26.66 %(C3-S1) in high saline range.
- Pond water is more suitable for irrigation in pre and post monsoon for these areas.

Keywords: Irrigation water quality, Water salinity and Seasonal variation.

Salinity is major constant of irrigation water for use the irrigation purposes use in coastal areas. Salinity deteriorate the quality of water and as well as soil also its reduce the crop production. The Indian Sundarbans mainly occurs in coastal tracts of North and south 24 Parganas, which constitute a major part of the coastal of west Bengal. The coastal area of W.B. extend over 0.82 million hectare and extends along 220 km of coastal line of two coastal district of W.B. With wide variability in climatic, topographical and edaphic conditions Mitra et al, (2014). The degraded soil and water

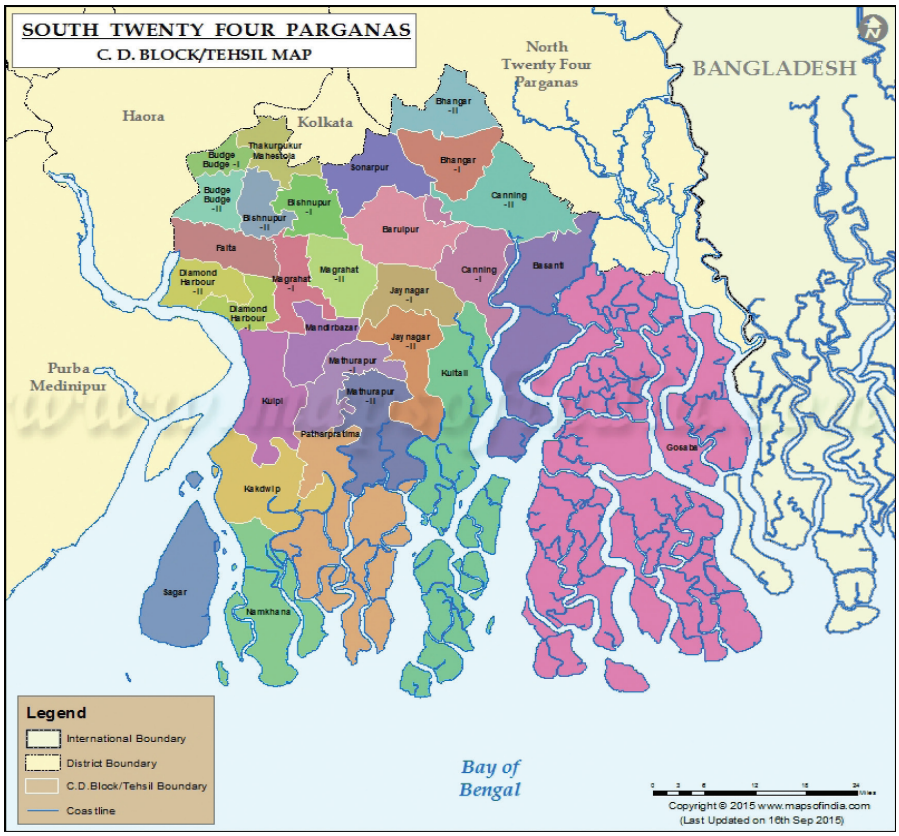
quality together with climatic advertise like a cyclone, tsunami, heavy rains, rising tide etc. have contributed to poor livelihood security and low agricultural productivity of the area *Bandhyopadhyay et al.* (2001). Use of ground and surface water for irrigation has played a vital role in meeting the demand of crops but its blind use has caused bad effects on soils as reported by various workers kumar *et al.* (2014) Central Soil salinity Research institute CSSRI (1998) reported the harmful effects of saline water for irrigation ,which are mainly associated with salt accumulation through water to plants, delayed germination, slow growth rate and crop failure in coastal areas. Shammi *et al.* (2016) reported excessive soluble salts or exchangeable sodium are allowed to accumulate in the soil as a result of irrigation with saline or sodic water. Such accumulated salt could not move downward along with infiltration of rainwater and ultimately reach the water table and may affect the ground water quality also. Therefore, a continuous monitoring of water quality is necessary to understand the level and nature of such contamination (Vasanthy and Velmurugan, 2009).

On the other hand fresh ground water only available below 300 m ground water level and withdrawal of this water is a hard task for local people (Gyen and Zaman, 2013).The definition of water quality to a great extent is depending on the desired use of water. Different uses require different criteria of water quality as well as standard methods for reporting and comparing result of water analysis (Babiker 2007; Khodapanath 2009). Seasonal variation is dominant factor for the utilization of ground and surface water. The pre monsoon samples exhibit poor quality in greater percentage compared with post- monsoon due to effective leaching of ions Swati *et al.*(2012). The objective of present study was to assess chemical water composition and its suitability for the irrigation and other uses.

Materials and method

Study area

The study area (Canning Block) located at 22.32°N 88.67°E. It has an average elevation of 4 metres (13 feet). It is gateway to the Sundarbans It is situated on the south bank of the Matla River. It is part of the Kolkata Suburban Railway system and is connected to Sealdah station and is also connected to Kolkata by road.



Figuer.1 Map of the study area canning Block.

Sampling and analysis

The total 60 ground and surface (Shallow tub well, pond) samples were collected tube well and pond in region during the pre- monsoon (April –May, 2011) and post monsoon (October –November,2011) .the ground water samples were collected from 1 L narrow mouth pre-washed polyethylene bottles. The water samples filtrated after the taken reading of turbidity. The water samples filtered through 0.45 micro meter Millipore membrane filters to separate suspended particals. Electrical conductivity (EC) and pH values were measured in the laboratory using electrode EC and pH meters. Acid titration were used to determine the concentration of bicarbonate (HCO_3^{--}), Carbonate (CO_3^{--}),and Mohr's titration method were used to determine the concentration of chloride in groundwater. Concentrations of major anions (F) were determined by UV spectrophotometer. Concentration of major cations Calcium (Ca^{2+}) , magnesium (Mg^{2+}) was analysed by titrimetric method and sodium (Na^{+}) and Potassium (K^{+}) were determine using flame Photometer. Sodium adsorption ratio (SAR) and Residual sodium carbonate (RSC) were calculated using the formula. For the suitability of water for irrigation purpose calculated data were compared with USSL diagram. US Salinity laboratory (1954).

Quality and classification of water

The quality of irrigation water depends primarily upon its salt content. Richard (1954) proposed a rational approach to ascertain the quality of irrigation water recommending the SAR as major parameter because of its direct relation to the adsorption of sodium by soil. Eaton (1953) suggested the concept of RSC to evaluate the essence and the existence of high carbonates in water. By holding in mind the importance of such parameters, the irrigation suitability assessment of the water samples was carried out by using quality and classification system given US Salinity laboratory, 1954. (Table1).

Result and discussion

Physico-chemicals characteristics of water

pH of a water is an important indicator of water quality and the extent of pollution in the surrounding area. The collected water samples were neutral to alkaline in nature; the range of the pH values of shallow tube well in pre monsoon is 7.34-8.38 and 7.14-7.64 in post monsoon **(**Table.2). The pH of Pond water samples had varies in range differences of 7.13-8.41 and 6.93-8.21 in pre and post monsoon respectively. Electrical conductivity is important parameters for the identification the suitability of water for irrigation purposes. These study areas are found under the coastal belt so effects of salinity appear there. The range of EC values of Shallow tub well in pre and post monsoon is 0.82-2.88 $ds^{-1}m$ and 0.39-2.14 $ds^{-1}m$ respectively (Table.2) .The range differences of electrical conductivity of pond water samples varies is 0.71-2.17$ds^{-1}m$ in pre – monsoon and 0.35-1.12 $ds^{-1}m$ (Table.2) was found in after monsoon. Most of samples in both water sources in pre monsoon were found unsuitable for irrigation purposes, but after monsoon increase the suitability of water for irrigation, The changes in different physic-chemicals parameters a decreasing trend observed after the monsoons which indicate that the pH, salinity and concentration of ions of fresh ground water zone has decrease over the four month (Verma et al 2012, Choudhury *et al.* 2012).

Table 1: Limits of some important parameter indices for rating groundwater quality and its suitability in irrigation use.

	Water quality indices		
Category Suitable for irrigation	EC (µs/cm)	SAR	Suitable for irrigation
I	100-250	<10	Excellent
II	250-750	10-18	Good
III	750-2250	18-26	Fair
IV	>2250	>26	Poor

US Salinity Laboratory Staff, 1954

COD concentration in water quality represents the total amount of oxygen which is required to oxidize all the organic matter in a sample to CO2 and H2O (Boyd, 1998). In the present study, the COD ranged of the Shallow tub well in pre- monsoon is 1.20-5.60 and 0.8-3.2 mg/L, after the monsoon (Table.2). Pond water samples were found the excess compare to the shallow water. Pond water samples were varies COD between the range of 22.90-78.10 mg/L, (Table.2) in pre-monsoon and 12.8-54.82 mg/L, after

the monsoon (Table.2). Excess of COD in water samples indicate the availability of organic matter in water Nag *et al (*2014).

Chloride (Cl^-) is an important parameters in water its represent the intensity of salt concentration it is essential to plants in very low amount, it can cause toxicity to sensitive crops at high concentrations effect on plat growth. According to (Mass,1990) the Cl^- concentration below 70 mg/L is generally safe for all plants. The range of Cl^- in shallow tube well varies between 383.21- 2699.16 mg/l in pre monsoon and 149.95-2399.26 mg/l in after monsoon (Table.2). Pond water was found the range difference of Cl^- concentration in pre monsoon is 949.71-2424.25 mg/l and 674.79-2174.33 mg/l (Table.2) in post monsoon Shah *et al.* (2013).

Nitrate concentration of in shallow water found in the ranged of 0.5-5.7 mg/l in pre- monsoon and 0.32-3.70 after the monsoon. In pond water samples were found the nitrate in range of 0.5-4.80 (Table.2) in pre monsoon and 0.31-3.40 mg/l (Table.2) after the monsoon. Nitrogenous materials are rare in the geological record; therefore, occurrence of nitrate in groundwater is an anthropogenic pollutant contributed by nitrogenous fertilizers, industrial effluents, human and animal wastes through biochemical activity of nitrifying bacteria, such as *Nitrosomonas* and *Nitrobacter*. All sources of nitrogen are potential sources of nitrate. In water, especially groundwater, these sources include decaying plant or animal material, agricultural fertilizers, manure, domestic sewage, industrial wastewaters, precipitation, or geological formations containing soluble nitrogen compounds. The nitrate concentration in groundwater and surface water is normally low for all the samples. Groundwater levels are higher compare to the pond samples water, This include leaching of organic and inorganic fertilizers from agricultural land by infiltration and percolation of rainwater, irrigation water, animal waste, leakage from sewers Raju *et al.* (2009).

Fluoride content in shallow tube was found in range of 0.25-1.25 ppm in pre monsoon and 0.21-0.82 after monsoon. In pond water a sample fluoride varies in rang of 0.12-0.71 ppm, but after monsoon is reduces in range of 0.10-0.69 ppm. Fluoride is essential for teeth if its under the permissible limit < 1.5 ppm. (WHO, 2012), but excess of permissible limit the causes the fluorosis in human body**.** Water for irrigation purposes is no prescribed standards are suggested by WHO.

Sulphur is essential nutrient for the crop growth and it's also in oil seed crops sulphur increase the oil content and improves the quality of oil. In water sulphur converted into sulphate form. Sulphate (SO^-_4) content in shallow tube in pre- monsoon was found ranging from the 6.7-31.2 mg/L. and 5.7-28.30 mg/L. (Table.2) after the monsoon. In pond water samples SO^-_4 content in pre- monsoon varies from 21.7-122.7 mg/L., but after the monsoon sulphate content found the range 3.5-17.9 mg/L.(Table.2).

The calcium and magnesium in waters are generally used to classify the suitability of water. Calcium and magnesium are directly related to hardness of the water and these ions are the most abundant elements in the surface and groundwater and exist mainly as bicarbonates and to a lesser degree in the form of sulphate and chloride. The range of the Ca^{++} in shallow tube well observed in pre monsoon is 18.7-69.7 mg/L and post monsoon is 16.8-62.5 mg/L (Table.2). Pond water samples carried calcium content in the range of 16.8-62.5 mg/L. in pre monsoon and13.6-30.5 mg/L. after the monsoon (Table.2). Magnesium (Mg^{++}) in shallow tube well were varies in pre- monsoon ranging from the 15.06 – 84.61mg/L. (Table.2) and 3.06-65.09 mg/L.(Table.2) after the post monsoon. In pond water samples in pre- monsoon were found the range between the 16.23-85.33 mg/L. and 11.41-71.14 mg/L. (Table.2) after the post monsoon. Magnesium is a dominant element found in the both of water sampler in pre and pot-monsoon and its responsible factor for the water quality (mitra *et al.* 2016).

Sodium content in shallow tube found in pre-monsoon ranges from 2.5-28.1 mg/L. and 4.3-17.5 mg /L. (Table.2) after the post-monsoon. In pre – monsoon pond water samples sodium content varies in the ranging from 4.9-17.3 mg/L. and after the post – monsoon sodium content found range from 3.22- 12.8 mg/L.(Table.2). Sodium content was found the under the permissible limit both of water sources in pre and post monsoon WHO (2012).Potassium (K^+) is primary nutrients for the crop and its more quantity require for the crop growth and development but quality of irrigation water its permissible, highest desirable or maximum permissible limit was not set by FAO, BIS and WHO.

Potassium content In shallow tube well found in pre- monsoon ranges from0.4-7.3 mg/L. and 0.31- 6.3 mg/L. (Table.2) after the monsoon. In pond water samples potassium found ranges from 0.4-7.2 mg/L. in pre- monsoon and 0.2-6.5 mg/L. (Table.2) after the monsoon respectively.

An important chemical parameter for judging the degree of suitability of water for irrigation is sodium content or alkali hazard, which is expressed as the sodium adsorption ratio (SAR).The observed SAR values of Shallow tube well in ranging from the 0.31-3.75 in pre-monsoon and 0.9-2.4 after post monsoon (Table.2). Pond water samples wear found in the range of 0.72-2.23 before monsoon and 0.60-2.0 after the monsoon season (Table.2). The sodium hazard or SAR is expressed in terms of classification of irrigation water as low (S1: <10), medium (S2: 10 to 18), high (S3: 18 to 26) and very high (S4: > 26). A high SAR value implies a hazard of sodium (alkali) replacing Ca^{2+} and Mg^{2+} in the soil through a cation exchange process that damages soil structure, mainly permeability, and which ultimately affects the fertility status of the soil and reduces crop yield (Gupta,2005). The RSC value of shallow tube well in pre- monsoon ranging from (39.3) - (-21.27) and (-84.3)- (-23.0) after the post –monsoon. Pond water samples were found RSC in range of (-132.21)-(-33.01) pre-monsoon and (-101.5)-(-25.9) after the post-monsoon Verma *et al*.(2016).

Table 2: Physico- chemicals property of Shallow Tube well and pond water samples.

Parameters	Shallow Tube well						Pond					
	Pre- monsoon			Post-monsoon			Pre- monsoon			Post-monsoon		
	Range	**Mean**	**SD**	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**	**Range**	**Mean**	**SD**
pH	7.34-8.38	8.2807	0.3274	7.14-7.64	7.3680	0.1423	7.13-8.41	8.087	0.408	6.93-8.21	7.727	0.439
Ec (dsm^{-1})	0.82-2.88	1.559	0.719	0.39-2.14	0.997	0.511	0.71-2.17	1.239	0.432	0.35-1.12	0.624	0.212
Turbidity (NTU)	0.70-3.10	1.773	0.811	1.1-4.1	2.335	0.822	32.87-50.63	42.06	5.29	41.73-91.41	62.88	15.42
COD (mg/L)	1.20- 5.60	2.687	1.089	0.8-3.2	1.927	0.682	22.90-78.10	43.76	16.95	12.8-54.82	31.00	12.94
Cl^- (mg/L)	383.21-2699.16	1172	578	149.95-2399.26	931	613	949.71-2424.25	1432	407	674.79-2174.33	1136	428
CO_3^-(mg/L)	0.00-0.137	0.0346	0.0506	0.00-0.04	0.01268	0.01254	0.00-0.0060	0.00201	0.00202	0.0-0.05	0.01670	0.01415
HCO_3^- **(mg/L)**	0.015-386	0.0688	0.0980	0.006-0.040	0.02277	0.01011	0.015-0.051	0.03592	0.01082	0.009-0.073	0.03646	0.01750
F^- (mg/L)	0.25-1.22	0.5086	0.2819	0.21-0.82	0.4273	0.2105	0.12-0.71	0.3518	0.1546	0.10-0.69	0.2953	0.1552
NO_3^- (mg/L)	0.5-5.7	1.785	1.378	0.32-3.70	1.317	0.943	0.5-4.80	2.427	1.189	0.31-3.40	1.909	0.979
SO_4^- (mg/L)	6.7-31.2	8.00	16.54	5.7-28.30	14.29	7.25	21.7-122.7	52.06	27.35	3.5-17.39	43.31	22.15
Hardness (mg/L)	94.0-368.7	229.2	103.4	42.0-286.0	171.2	90.5	83.3-392.2	246.7	96.3	62.0-322.0	181.1	86.0
Ca^{++} ((mg/L)	18.7-69.7	36.91	15.83	10.4-37.7	20.79	7.80	16.8-62.5	29.49	11.43	13.6-30.5	20.20	5.18
Mg^{++} (mg/L)	15.06-84.61	46.93	26.31	3.06-65.09	36.70	22.35	16.23-85.33	53.01	22.74	11.41-71.14	39.25	20.36
Na^+ (mg/L)	2.5-28.1	11.43	7.08	4.3-17.5	9.80	4.01	4.9-17.3	10.100	3.848	3.2-12.8	7.920	2.776
K^+ (mg/L)	0.4-7.3	3.727	2.091	0.31-6.3	3.177	1.828	0.4-7.2	3.227	2.162	0.2-6.5	2.700	1.934
SAR	0.31-3.75	1.524	0.955	0.9-2.4	1.563	0.482	0.72-2.23	1.372	0.498	0.60-2.0	1.297	0.476
RSC	(39.3)-(-21.27)	-83.73	25.64	(-84.3)-(-23.0)	-57.45	22.26	(-132.21)-(-33.01)	-82.46	27.55	(-101.5)-(-25.9)	-59.40	23.21

Table 3: Water Suitability percentage (%) for irrigation purposes pre -monsoon and post- monsoon, 2011.

Pre-monsoon			Post-monsoon		
Source	Salinity	Percentage (%) samples	Source	Salinity	Percentage (%) samples
Shallow	Low	-----	**Shallow**	Low	----
	Medium	----		Medium	46.66
	High	73.33		High	53.33
	Very High	26.66		Very High	-------
Pond			Pond		
	Low	---		Low	-------
	Medium	6.66		Medium	73.33
	High	93.33		High	26.66
	Very High	---		Very High	-----

Table 4: Classification of water samples collected from different sources for irrigation purpose Pre-monsoon and post - monsoon according to USSL diagram, 1954.

Pre-Monsoon-2011					Post-Monsoon-2011			
Sample Number	Source of Water	Class	Type of salinity	Remark	**Source of Water**	**Class**	**Type of salinity**	**Remark**
1	Shallow	C3-S1	High saline water	Special management required.	Shallow	C2-S1	Medium Saline Water	Can be used
2	Shallow	C3-S1	High saline water	Special management required	Shallow	C3-S1	High saline water	Special management required
3	Shallow	C3-S1	High saline water	Special management required	Shallow	C2-S1	Medium Saline Water	Can be used
4	Shallow	C4-S1	Very high saline water	Not suitable	Shallow	C2-S1	Medium Saline Water	Can be used
5	Shallow	C3-S1	High saline water	Special management required	Shallow	C3-S1	High saline water	Special management required
6	Shallow	C3-S1	High saline water	Special management required	Shallow	C2-S1	Medium Saline Water	Can be used
7	Shallow	C3-S1	High saline water	Special management required	Shallow	C3-S1	High saline water	Special management required
8	Shallow	C3-S1	High saline water	Special management required	Shallow	C3-S1	High saline water	Special management required
9	Shallow	C3-S1	High saline water	Special management required	Shallow	C2-S1	Medium Saline Water	Can be used
10	Shallow	C3-S1	High saline water	Special management required	Shallow	C3-S1	High saline water	Special management required

11	Shallow	C3-S1	High saline water	Special management required	Shallow	C3-S1	High saline water	Special management required
12	Shallow	C4-S1	Very high saline water	Not suitable	Shallow	C3-S1	High saline water	Special management required
13	Shallow	C3-S1	High saline water	Special management required	Shallow	C2-S1	Medium Saline Water	Can be used
14	Shallow	C4-S1	Very high saline water	Not suitable	Shallow	C3-S1	High saline water	Special management required
15	Shallow	C4-S1	Very high saline water	Not suitable	Shallow	C2-S1	Medium Saline Water	Can be used
16	Pond	C3-S1	High saline water	Not suitable	Pond	C2-S1	Medium Saline Water	Can be used
17	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
18	Pond	C3-S1	High saline water	Special management required	Pond	C3-S1	High saline water	Special management required
19	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
20	Pond	C3-S1	High saline water	Special management required	Pond	C3-S1	High saline water	Special management required
21	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
22	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium saline water	Can be used
23	pond	C3-S1	High saline water	Special management required	pond	C2-S1	Medium Saline Water	Can be used
24	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
25	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
26	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
27	Pond	C3-S1	High saline water	Special management required	Pond	C3-S1	High saline water	Special management required

28	Pond	C2-S1	Medium Saline Water		Pond	C2-S1	Medium Saline Water	Can be used
29	Pond	C3-S1	High saline water	Special management required	Pond	C2-S1	Medium Saline Water	Can be used
30	Pond	C3-S1	High saline water	Special management required	Pond	C3-S1	High saline water	Special management required

Water Quality for irrigation Purposes

The value of Electrical conductivity (EC) and Sodium adsorption ratio (SAR) values were plotted on US salinity diagram that in the zone of C2-S1, C3-S1 and C4-S1, salinity and sodicity of water were indicated by C and S respectively. Salinity of water indicate very high- salinity hazards (C4), high -salinity hazards (C3) Medium – salinity hazards (C2), and low sodium hazards (S1), Medium – sodium hazards (S2), High -sodium hazards (S3), and very –high sodium hazards through (S4).

The calculated water samples of the shallow tub well was categorised in pre -monsoon and found 26.66 Percentage (%) (Table.3) of water samples are under very high – saline range sample no. 4, 12,14, 15 (Table.4) and category under (C4-S1), it's not suitable for irrigation, another 73.33 percentage (%) (Table.3) shallow tube well water samples in pre- monsoon high saline range samples no. 1,2,3,5,6,7,8,9,10,11,13 (Table.4) and category (C3-S1),which required special management practices.

Water samples of shallow tube well in post-monsoon 53.33 percentage (%) (Table.3) of samples under high saline range sample no.2,5,7,8,10.11,12,14 (Table.4) and category (C3-S1) its required few management . The remaining 46.66 percentage (%) (Table.3) of water samples are found medium – saline range, sample no. 1, 3, 4, 6, 9, 13, 15 (Table.4) and its categorised under (C2-S1), this rank of water samples suitable for irrigation purposes. The improvement of water quality was found after monsoon due to the rainwater and dissolved the ions concentration (Swati *et al.* 2012).

Water samples of Pond in pre- monsoon were found 93.33 percentage (%) (Table.3) under high- saline range sample no.16,17,18,19,20,21,22,23,24,25,26,27,29,and 30. (Table.4) and categorised in (C3-S1), this category of water required some management practices. Another 6.66 percentage (%) (Table.3) of pond samples are found under medium saline range, samples no. 28, (Table.4) and category (C2-S1), it's suitable for irrigation purpose. Pond water samples are determine in post-monsoon and found the improvement in water quality about 73.33 percentage (%) (Table.3) water samples under medium range, sample no.16, 17, 19,21,22,23, 24, 25, 26, 28, and 29 (Table.4), categorised in (C2-S1) zone. This category of water samples were found safe for the irrigation purposes. The increment of water quality in ponds samples after monsoon due to the rainwater its result leaching of soluble salt in surface water body and reduces the salt concentration. (Verma *et al.* 2012). The remaining 26.66 percentage (%) (Table.3) of pond water samples after monsoon under the high saline zone, samples no.18, 20,27and 30 (Table.4), its categorised in (C3-S1) zone. This category of water samples were required some management practices for the utilization of irrigation purposes.

Conclusion

The results and its interpretation with soil and water salinity chart, result show the groundwater and pond water samples revealed that the shallow water of the studied area was more affected in pre-monsoon and post - monsoon compare to pond because of the high intrusion of sea water .The quality of pond water samples was secure and safe for irrigation purposes due to the collection of rain water in surface body. Problems of water quality in areas due to the high salinity and over loading of magnesium in water samples.

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