Effect of Stream Pollution on Well Water Contamination

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Abstract- **River Karimbana is a small multi-purpose reservoir in vatakara town in Calicut district, Kerala. This river had been used for washing, fishing, transportation, irrigation and other domestic uses by the people those who are living in the banks and the surrounded locality. Now a days the river is fund to be in the path of high level pollution due to various sources. The river water is seem to be black and producing high offensive odor and became a public nuisance to that locality. The well water from these local area is contaminated after this stream became polluted. So here we are conducting a study about this river and the well water contamination of this locality.**

I. INTRODUCTION

7 0% of the Earth is covered by water in which only a small portion of the natural resource is fit for human consumption. Out of the Earth's total water 97% is stored in oceans and remaining 3% is stored in various sources like rivers, lakes and ground water aquifers. In these natural resources rivers have a important role in the life of people and other living organisms surrounding by it. Unfortunately during the past two decades the river water quality deteriorated rapidly. The river karimbana is one of the example for it. While searching for the sources for the pollution we have found that a lots of hotels in the vatakara town is disposing their waste into this stream. Also we had found that a hospital which is situated in the banks of this river is discharging their effluent from their waste water treatment plant to the same river. As a result the river water is seem to be black colour and producing high offensive odor and became a public nuisance to that locality. The well water from these local area is contaminated after this stream became polluted. So here we are conducting a study about this river and the well water contamination of this locality.

II. METHODOLOGY

A. Study area

The study is conducted during the period of January –April 2017 near vatakara town in Calicut district, Kerala.
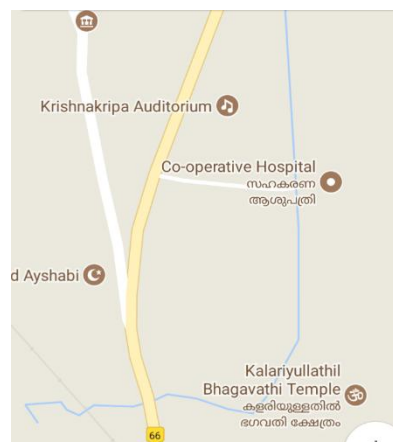

Fig1. Location map of study area

B. Sample collection

Here we have used manual sampling technique .The well water samples werecollected on either side of the stream which is 150 m and 300 m apart from the stream. The stream samples were collected in such a way that water was collected from 2 points in the upstream and 2 points from the downstream which is 300 m apart. Also the water was collected from the point in which the treated effluent is discharged from the hospital.Finally the effluents discharged from the hospital were collected from the hospital authority for testing its quality.

III. RESULTS AND DISCUSSION

Table1. Temperature of well water samples

Wells	Temperature °C
W1	27.3
W2	25
W3	27
W4	28

W1-Sample collected 300m apart from the stream at the east side.

W2- Sample collected 300m apart from the stream at the west side.

W3- Sample collected 150m apart from the stream at the east side.

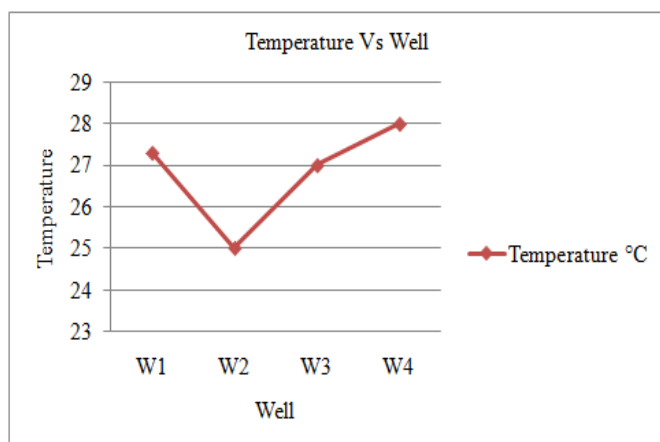W4- Sample collected 150m apart from the stream at the west side.

Fig2.Temperature vs well

Table2. Turbidity of well water samples

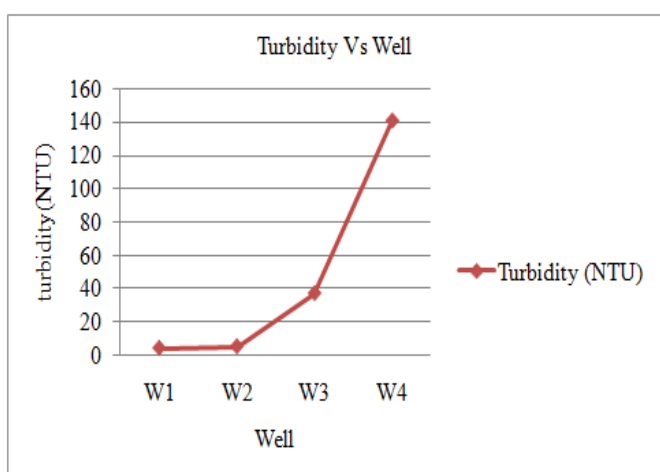| Well	Turbidity (NTU)
W1	4
W2	5
W3	37
W4	141

Fig3.Turbidity vs well

Table3. Chloride of well water samples

Well	Chloride (mg/l)
W1	4.99
W2	2.58
W3	22.493
W4	299.91
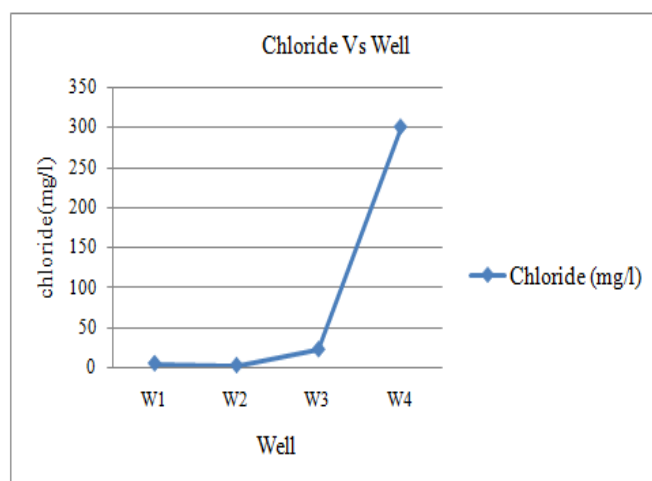
Fig 4.chloride vs well

Table4. pH of well water samples

Well	pH
W1	6.9
W2	7.3
W3	6.8
W4	7.5
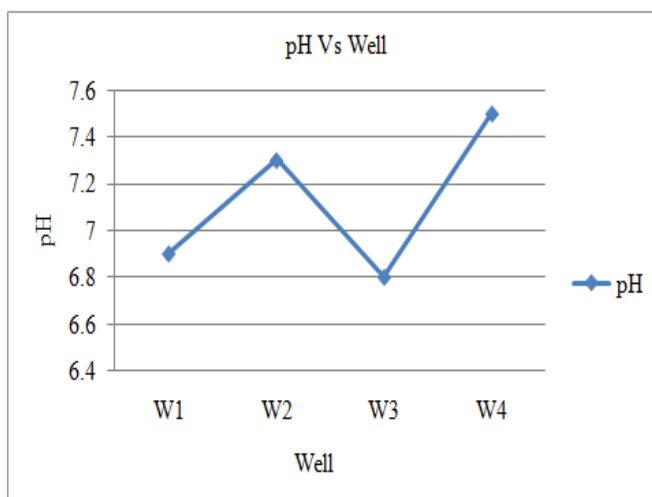
Fig5.pH vs well

Table5. DO of well water samples

Well	DO(mg/l)
W1	8.7
W2	8
W3	2.5
W4	3.1
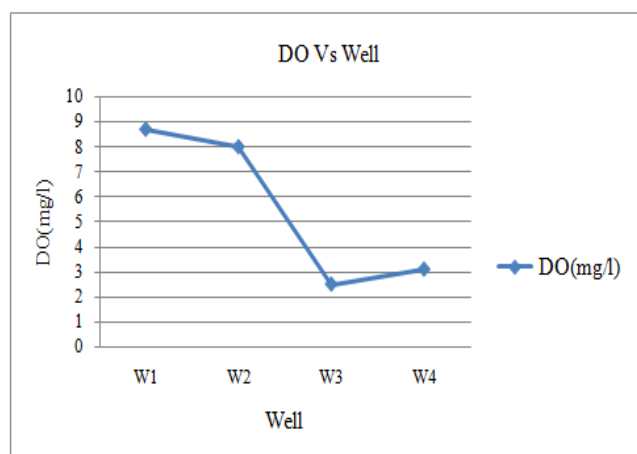
Fig 6.DO vs well

Table6. BOD of well water samples

Well	BOD(mg/l)
W1	1.3
W2	1.5
W3	2.5
W4	3.1
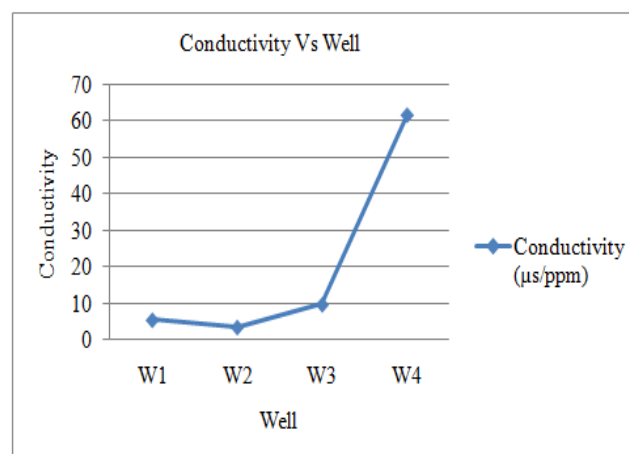
Fig8.Conductivity vs well

Table8. Total solids of well water samples

Well	Total solids(mg/l)
W1	250
W2	263
W3	510
W4	600
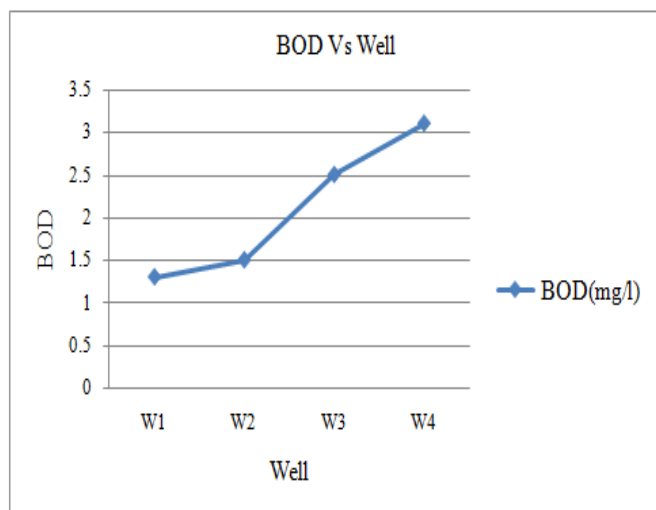
Fig7. BOD vs well

Table7. Conductivity of well water samples

Well	Conductivity (µs/ppm)
W1	5.4
W2	3.4
W3	9.6
W4	61.53
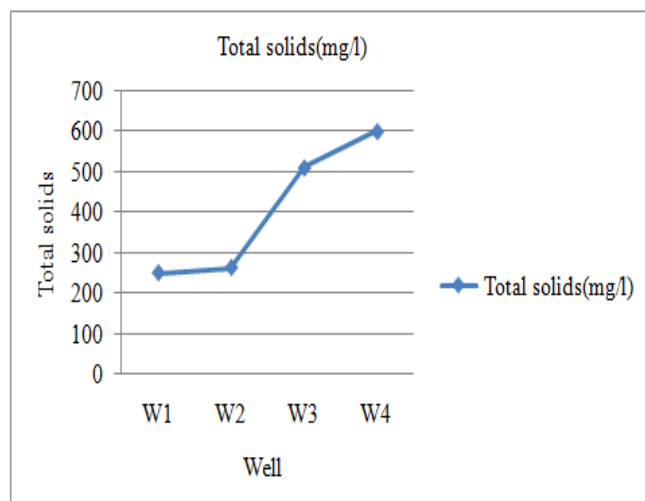
Fig9.Total solids vs well

Table9. Total coliform of well water samples

Well	Total coliform
W1	7
W2	9
W3	23
W4	39
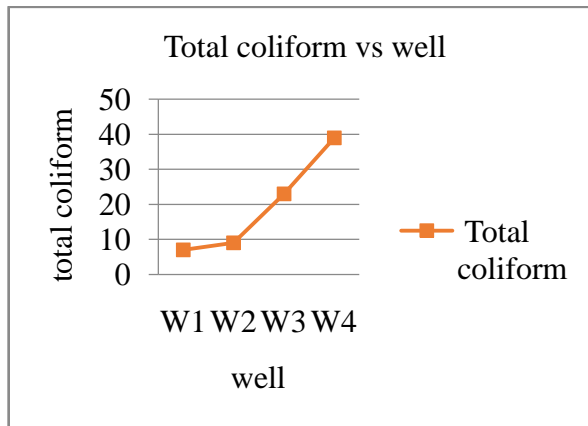
Fig10.Total coliform vs well

Table10. Parameters of Effluent

Parameter	Results
Colour	Colourless
Odour	Unobjectionable
Temperature	27° C
Turbidity	5NTU
pH	8.5
Chlorides	68mg/l
DO	6.9mg/l
BOD	8.8 mg/l
Total solids	77ms/ppt
Conductivity	10.5ms/ppt

Table11. Parameters of stream samples

parameter	Upstream 1	Upstream 2	Disposal point	Downstream1	Downstream 2
Colour	black	Black	black	black	Black
Odour	objectionable	Objectionable	objectionable	objectionable	Objectionable
Temperature	27°C	27°C	27°C	27°C	27°C
turbidity	60NTU	54NTU	58NTU	61NTU	60NTU
Ph	8.6	8.6	8.6	8.6	8.6
Chloride	205 mg/l	200.5 mg/l	200 mg/l	205 mg/l	205 mg/l
DO	0	0	0	0	0
BOD	240 mg/l	215 mg/l	238 mg/l	238 mg/l	230 mg/l
Total Solids	2000 ms/ppt	2000ms/ppt	2300ms/ppt	2100ms/ppt	2152ms/ppt
ConductiVity	335.2 ms/ppt	320ms/ppt	230ms/ppt	335.2ms/ppt	330ms/ppt

IV. CONCLUSION

Our work shows that stream water pollution significantly affect the well contamination. The well water samples were tested and compared with the drinking water standards, the results shows that nearby wells are contaminated. The contamination of well water decreases as the distance from stream increases. The effluent collected from the vatakara co-operative hospital was tested and compared with effluent standards. Comparison shows that effluent is within the limits of standards. The study also shows that the stream is highly polluted and is affect the contamination of well water. Various sources of stream pollution are discharge of municipal sewage, wastes from various bakeries in vatakara town and other buildings.

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