Varthur Lake Catchment – Bore well Mapping and Water Quality Analysis

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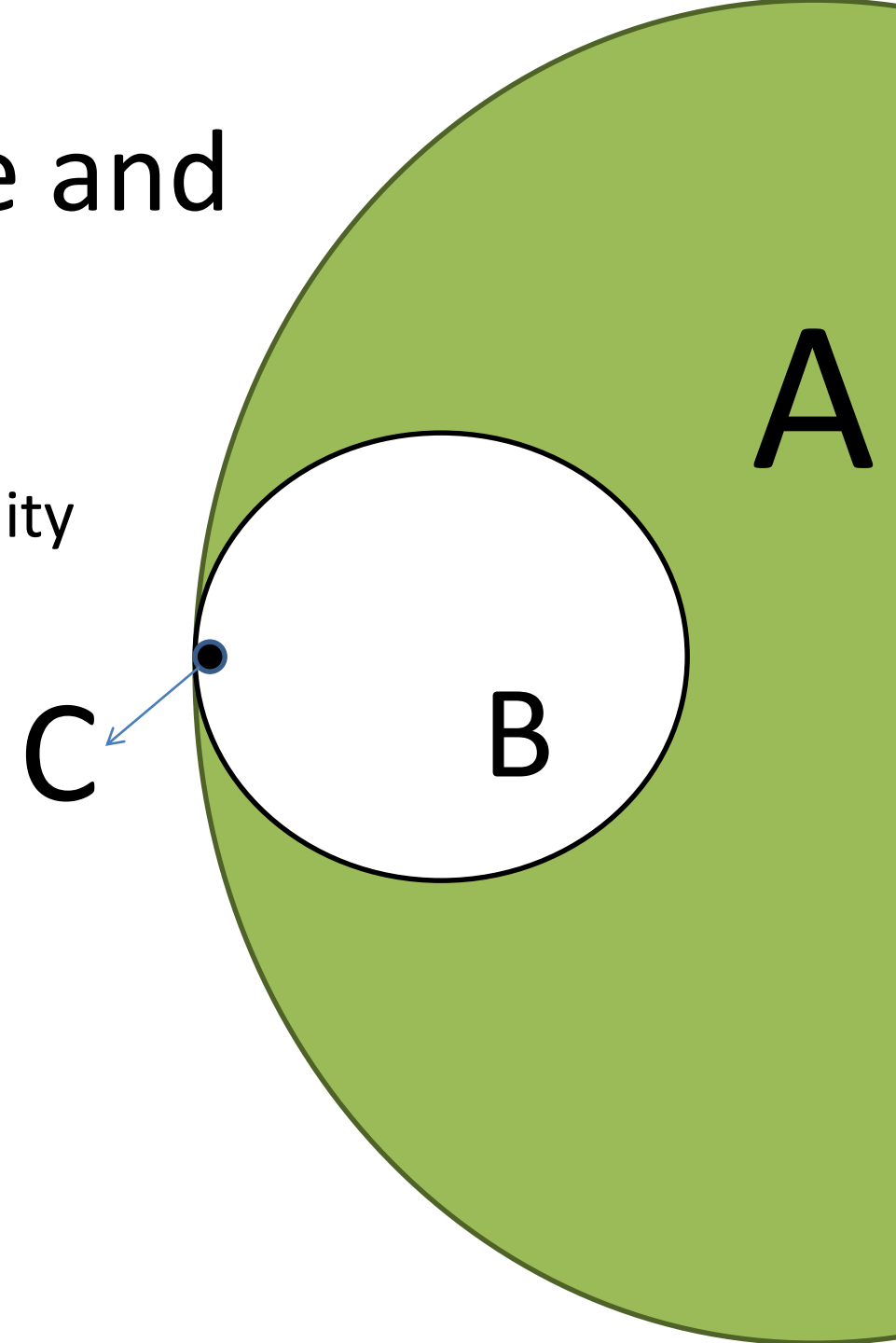
Water….. Our Most Endangered Element

- “Water ,water every where and not a drop to drink”
- Most precious, yet under-valued resource.
- Presently over 70% of the world’s population is without access to safe drinking water.
- Contaminated water and poor sanitation cause 30,000 deaths around the world daily.

- Contaminated sources of drinking water are increasing in frequency all over the world.
- We are pushing the water cycle beyond it’s natural limits.
- The less water we use , the less we degrade.

Water–here, there and everywhere

A – world's total water availability
97.5% is salt water
B – 2.5% - fresh water all in the form of ice or is underground.
C – 0.01% -fresh water is not in ice or underground.



Lakes

Lakes have an immense potential for harvesting rain water and recharging ground water.
In the absence of lakes, aquifer and ground water recharge will be drastically depleted.

Varthur lake

Polluted Varthur Lake

Need for the study

- Acute water scarcity .
- Number of bore wells increased .
- Lakes help in recharge of bore wells.
- Health hazard through polluted lake.

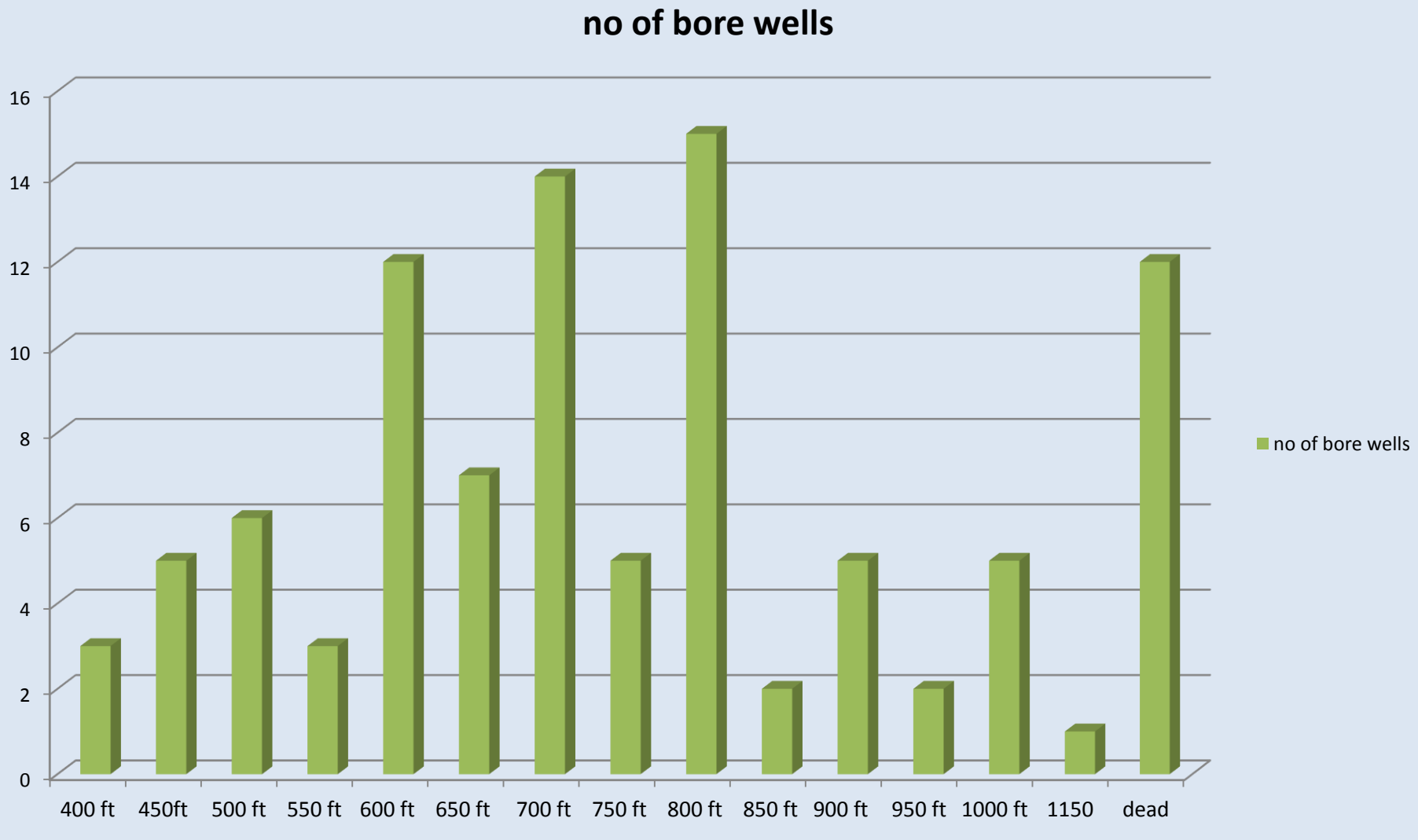
Google map of Varthur Lake

Study area


Image © 2014 CNES / Astrium
2003
Imagery Date: 2/26/2014 12°57'37.62" N 77°45'41.25" E

Bore wells within 500 mts

bore wells


no of bore wells
16
14
12
10
8
6
4
2
0
400 ft
450ft
500 ft
550 ft
600 ft
650 ft
700 ft
750 ft
800 ft
850 ft
900 ft
950 ft
1000 ft
1150
dead
no of bore wells

Water samples collected from borewells situated between 0.5 and 1 km

Students testing water quality in CES,IISc lab

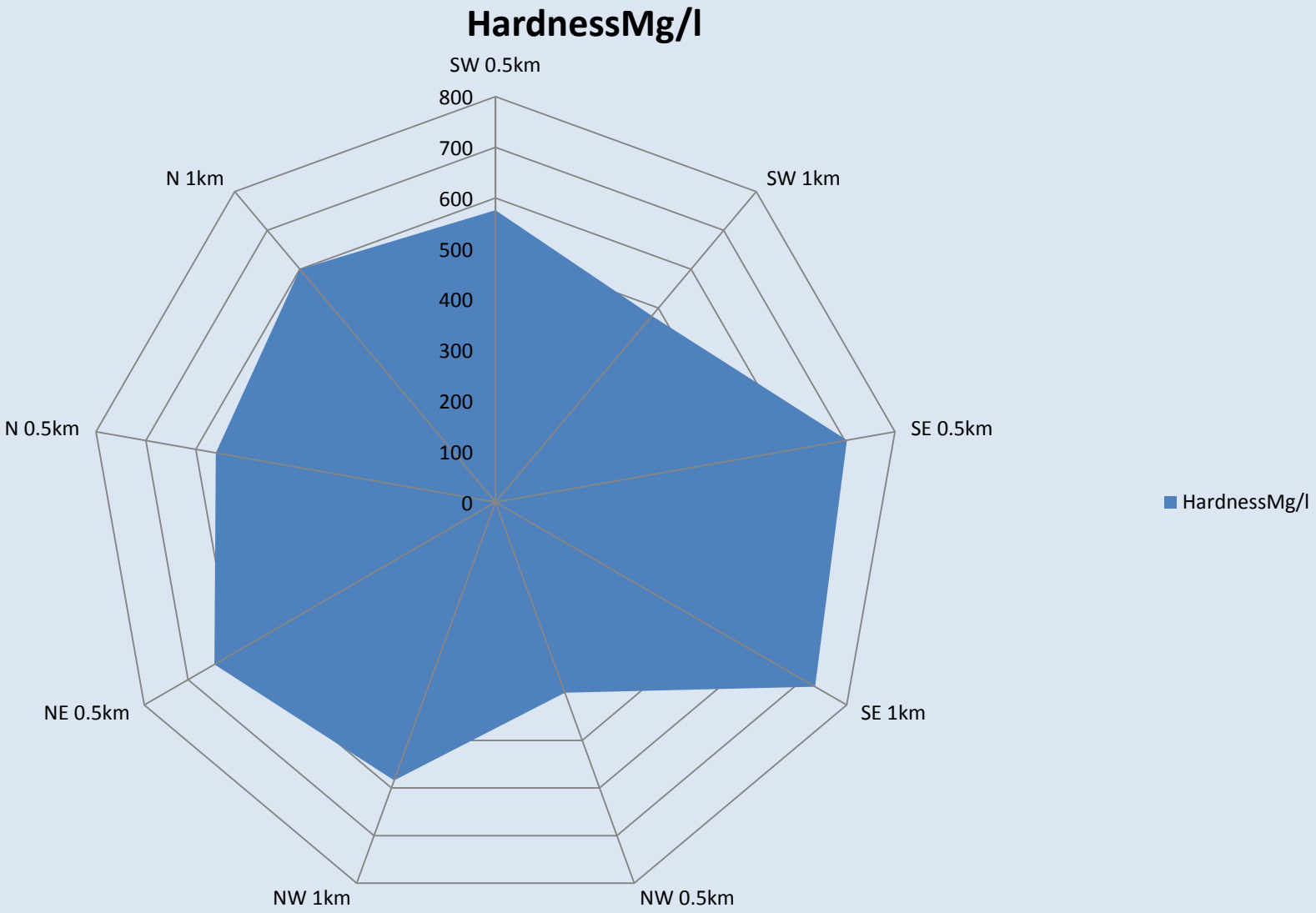
Table -1 showing the results of water quality analysis

Parameters	SW 0.5km	SW 1km	SE 0.5km	SE 1km	NW 0.5km	NW 1km	NE 0.5km	N 0.5km	N 1km	Limits
COD	40	16	28	44	36	4	20	20	28	
K	20.8	20	10	12	4.4	6.4	7.6	7.6	7.6	
Nitrates	1.836	1.742	0.78	1.28	1.237	0.455	0.457	1.548	1.67	45
P	0.036	0.045	0.05	0.036	0.057	0.062	0.035	0.034	0.043	
Ca mg/l	76.152	64.128	37.6752	31.26	42.4848	46.4928	31.2624	24.831	105.7	75

Table -2 showing the results of water quality analysis

	SW 0.5km	SW 1km	SE 0.5km	SE 1km	NW 0.5km	NW 1km	NE 0.5km	N 0.5km	N 1km	limits
TDS mg/l	866	783	774	983	649	741	673	663	907	300 to 500
pH	7.32	7.67	7.4	7.6	7.8	7	7.1	7.1	7.1	6.5to 8.5
EC	1218	1120	1131	1205	1021	1125	937	1049	1205	
Chloride	307	284	256	408	243	351	189	209	386	250
Alkality	320	340	456	456	460	212	500	336	340	
Fluoride mg/l	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6 to 1.2
HardnessMg/l	576	480	704	728	400	584	640	560	600	300

Hardness
(300mg/l to 600mg/l)



Result

- Our analysis shows that water samples collected form 1 km South east has hardness, chloride, alkalinity, TDS, EC and COD more than the permissible limit.
- Water samples collected form 0.5km South east has hardness, alkalinity, chloride, sodium more than the permissible limit.

Inference of water quality

- Topographical location influences the water quality
- Depth of the bore wells will also influence the water quality

Follow up

- To our surprise we found that these 2 bore wells(S.E 1 Km and S.E 0.5 Km)are a source of drinking water for almost 20 surrounding houses
- The SE 0.5 km bore well is used for commercial (selling of water for IT companies) as well as for agricultural purposes .
- We have informed the owners about the quality of the water and informed them not to use it for drinking and cooking .

Follow up

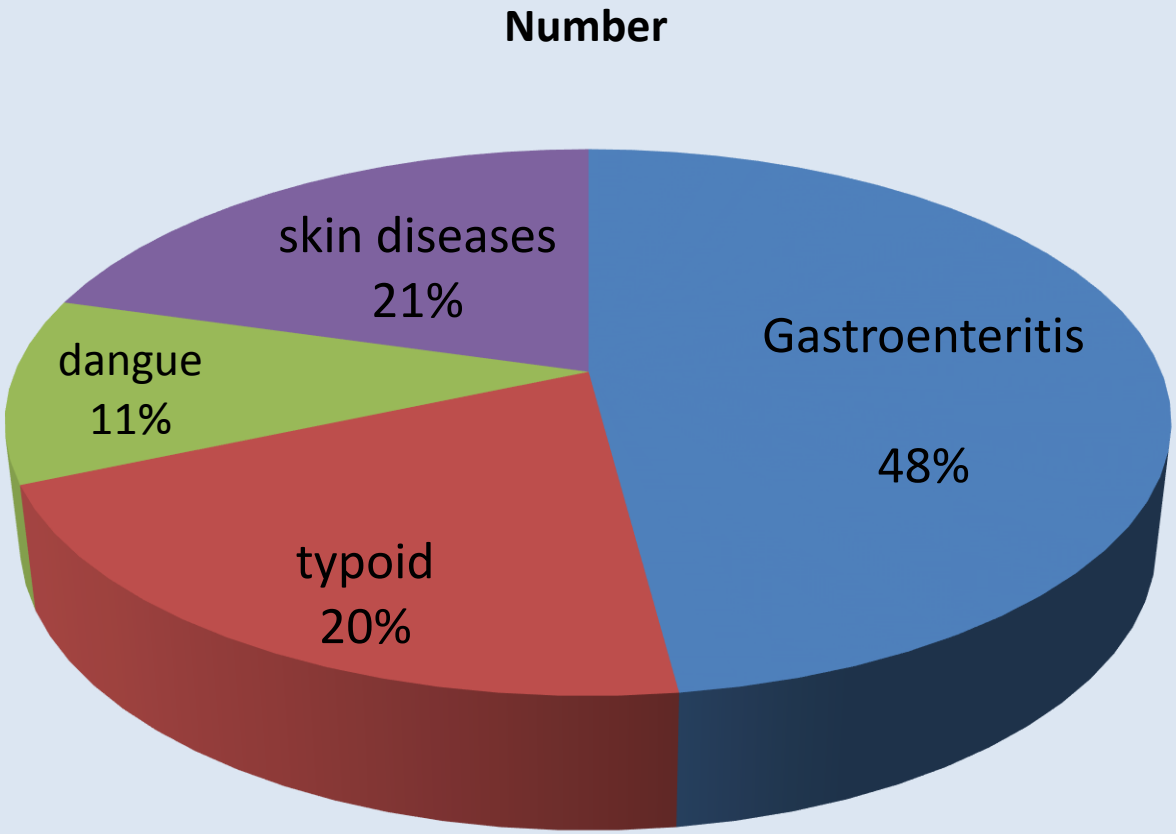
- Water quality analysis created doubts about health issues.
- Many people use this borewell water for drinking, cooking and domestic use
- Survey of doctors/hospitals – for common diseases was conducted.

Health data collection

A survey of hospitals in Varthur

- 5 hospitals were surveyed for the common diseases.
- The data is indicated in a pie chart which shows number of patients treated per week.

Chart showing number of cases per week



Commonly found water borne diseases in the study area

- Gastroenteritis
- Typhoid
- Dengue
- Skin diseases -dermatitis

Inference of the data

- There is a clear indication of the effect of polluted lake on the lives of the people in the neighbourhood.
- It also indicates ground water contamination.
- Unhygnic methods of fetching and storing of drinking water.

Health awareness

- Parents and local people were educated about the ill effects of polluted Varthur lake on their health.
- To store and use drinking water by boiling it.

Conclusion

- Ground water available in the borewells is not suitable for human consumption.
- Health hazards, prevention methods and awareness programmes in the neighbourhood are necessary.

PROTECT, CONSERVE AND PRESERVE LAKES FOR A HEALTHY COMMUNITY AND A HEALTHY LIVING.

Thank you