



NAVJIVAN SCIENCE COLLEGE, DAHOD

Conducted by : Dahod Anaj Mahajan Sarvajanic Education Society, Dahod
Affiliated with Shri Govind Guru University, Godhra

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Best Practices-2

Good Practices of Water analysis

Title: "To check the water quality by quantitative and qualitative analysis of Dahod district"

Objectives:

The objective of microbial and chemical analysis of water is crucial for assessing its quality and safety. Here are the objectives for each type of analysis:

Microbial Analysis:

- 1. Detection of Pathogens:** Identify and quantify harmful microorganisms such as bacteria, viruses, and protozoa that can cause waterborne diseases.
- 2. Indicator Organisms:** Measure indicator organisms like *E. coli* or faecal coliforms to indicate the potential presence of faecal contamination and assess the risk of pathogens.
- 3. Monitoring Treatment Effectiveness:** Evaluate the effectiveness of water treatment processes in eliminating or reducing microbial contaminants.
- 4. Compliance:** Ensure compliance with regulatory standards and guidelines for safe drinking water.



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Chemical Analysis:

1. **Identification of Chemical Contaminants:** Detect and quantify various chemical pollutants such as heavy metals (e.g., lead, mercury), pesticides, pharmaceuticals, and industrial chemicals.

2. **Assessment of Water Quality Parameters:** Measure parameters like pH, turbidity, dissolved oxygen, and nutrients (nitrogen, phosphorus) to assess overall water quality.

3. **Environmental Impact:** Evaluate the impact of human activities (agriculture, industry, urbanization) on water quality through the presence of specific chemical compounds.

4. **Health Risk Assessment:** Determine potential health risks associated with exposure to chemical contaminants in water, ensuring safe consumption and use.

By combining microbial and chemical analyses, water quality experts can provide a comprehensive assessment of water safety and suitability for various uses, from drinking and recreational activities to agricultural and industrial purposes. These analyses are essential for regulatory compliance, public health protection, and environmental conservation efforts.

The Context:

- The main contextual feature or we can say the challenges were faced :
 - a. There is no significant challenges were faced because it is very easy and well-studied method to do analysis of water



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The practices:

- This almost very good experience for the institute to do check the quantitative and qualitative analysis of water by microbial and chemical method
- Its gives good aspect regarding the build-up of water and contamination criteria
- From this study villagers were aware of the quality of water and its importance
- It is also good to know information to us by doing this practices

Evidence of Success:

- Result of Chemical analysis of water are given below in tabular form:

	pH	TDS	EC	ORP	Temp.	Salinity	DO	Fluoride	Chloride	Nitrate	Sulphate	Phosphate	Uranium	TH (mg/l)	Ca-H (mg/l)	Mg-H (mg/l)	PA (mg/l)	TA (mg/l)	CO ₃ ²⁻	HCO ₃ ⁻
pH	1.00																			
TDS	-0.18	1.00																		
EC	-0.18	1.00	1.00																	
ORP	0.06	0.00	0.00	1.00																
Temp.	0.16	-0.12	-0.12	0.13	1.00															
Salinity	-0.18	1.00	1.00	0.00	-0.11	1.00														
DO	0.17	-0.07	-0.07	0.47	0.10	-0.07	1.00													
Fluoride	0.37	0.08	0.08	-0.12	-0.01	0.09	-0.12	1.00												
Chloride	-0.10	0.76	0.75	0.07	0.05	0.75	-0.10	-0.02	1.00											
Nitrate	0.02	0.24	0.24	0.06	0.01	0.24	0.15	0.08	0.23	1.00										
Sulphate	-0.01	0.87	0.67	-0.02	-0.11	0.67	-0.13	0.18	0.58	0.21	1.00									
Phosphate	0.13	0.05	0.05	0.04	0.19	0.05	0.16	0.07	0.03	0.05	-0.01	1.00								
Uranium	-0.07	0.45	0.44	-0.10	0.08	0.44	0.04	0.09	0.41	0.07	0.15	0.10	1.00							
TH (mg/l)	-0.37	0.74	0.74	0.00	0.00	0.74	-0.14	-0.08	0.76	0.25	0.67	0.06	0.40	1.00						
Ca-H (mg/l)	-0.44	0.62	0.61	0.03	0.05	0.61	-0.11	-0.28	0.75	0.24	0.43	0.03	0.40	0.88	1.00					
Mg-H (mg/l)	-0.34	0.75	0.75	0.00	-0.02	0.75	-0.14	-0.02	0.73	0.25	0.71	0.07	0.38	0.99	0.81	1.00				
PA (mg/l)	0.63	-0.04	-0.04	0.07	0.23	-0.04	0.06	0.38	0.07	0.00	-0.01	0.16	0.00	-0.18	-0.22	-0.16	1.00			
TA (mg/l)	0.29	0.36	0.36	0.00	0.19	0.36	0.06	0.28	0.21	0.21	0.27	0.15	0.33	0.15	-0.01	0.19	0.35	1.00		
CO ₃ ²⁻	0.63	-0.04	-0.04	0.07	0.23	-0.04	0.06	0.38	0.07	0.00	-0.01	0.16	0.00	-0.18	-0.22	-0.16	1.00	0.35	1.00	
HCO ₃ ⁻	0.11	0.40	0.40	-0.03	0.13	0.40	0.04	0.18	0.20	0.23	0.29	0.11	0.35	0.21	0.06	0.23	0.06	0.96	0.06	1.00



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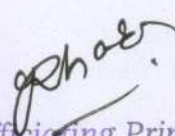
- EC, TDS and Salinity values of most of the water samples were found very high at many locations.
- Most of the water quality parameters in the selected districts were within the BIS/WHO range.
- From the data it can be said that around 20% samples may contain Fluoride content above the BIS limit.
- There was a consistent relation among the TDS, EC and Salinity values as observed from their ratio charts.
- There was a significant positive correlation among the pairs i.e. hardness-chloride content and TDS-hardness, TDS-chloride and TDS-Sulphate content.
- Nitrate, Sulphate and Phosphate values were quite below the detection limit in most of the water samples.

Results of Microbial analysis:

- **Colony Counts (CFU/mL):** 10 *E.coli*/ml -Indicates the number of colony-forming units per milliliter. a high count of total coliforms or *E. coli* suggests significant contamination. (Normal Range: 0-1 *E.Coli*/ml)
- **MPN Index:** 96 MPN/ 100ml of water -Provides a statistical estimate of microbial density. Higher MPN values indicate greater microbial contamination. ((Normal Range: 0-1.8 MPN/100ml))
- **Concentration Levels:** Can help determine if the water meets regulatory standards for safe consumption or other uses. For instance, many regulations require *E. coli* levels to be below a certain threshold (e.g., 0 CFU/100 mL for drinking water).

Problem encountered and Resources required:

- There is no major problem with this good practices and yes there is need of some special indicator bacterial strain to analyse the water
- Also required some specific chemicals for that


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