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Global Water Quality Standards: A Comparative Analysis for Sustainable Future

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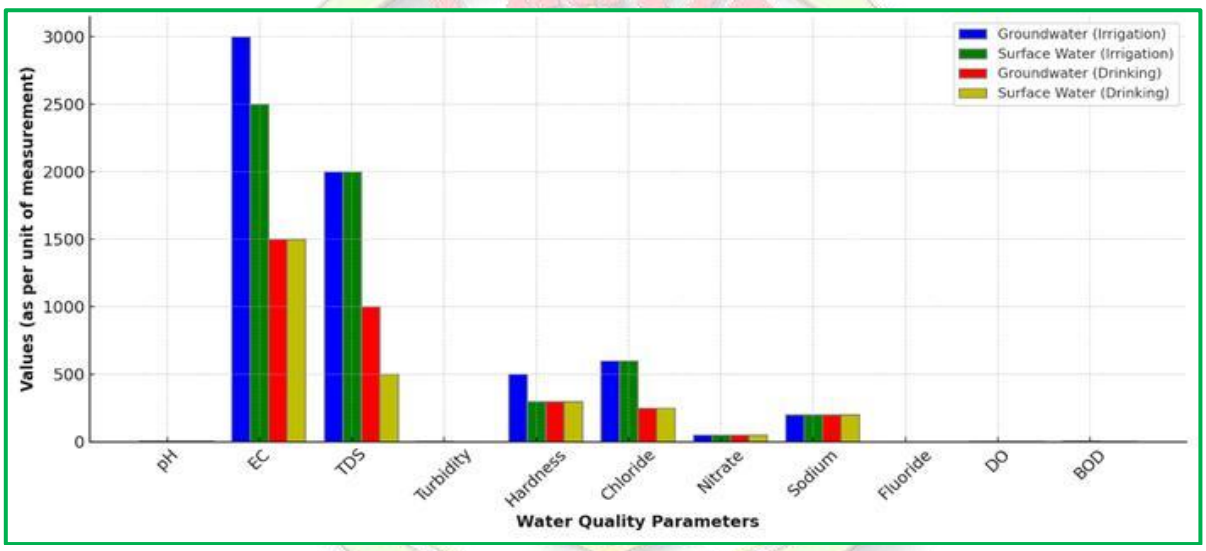
Surface and ground water quality must meet certain criteria, especially for the intended use-in this case, irrigation or drinking water. Certain parameters of pH, TDS, and nitrates are set by ISO, WHO, and EPA guidelines for acceptable levels in water. It compares these parameters of the different types of waters (surface and groundwater) for irrigation and drinking purposes, and thus understand how maintaining these appropriate levels of water quality is vital..



Comparison of Water Quality Parameters (Irrigation & Drinking)

Essential Comparability Between Irrigation and Drinking Water Standards

Salinity Control in Irrigation Water: High tolerance of Electrical Conductivity (EC) and Total Dissolved Solids (TDS) in irrigation water to control the salinity levels in the soil, therefore crop yields and health.

Crop Requirements: Dependent on the crop, there can be varying needs that need to be satisfied, including salinity or sodium sensitivity, other minerals or contaminants with regard to irrigation water standards to ensure healthy growth.

Tolerance for Hardness: Irrigation standards can be more tolerant of water hardness because it is not likely to impair plant growth but will modify the soil structure over a period of use. Hardness in drinking water will impart a different taste as well as corroding the plumbing systems.

Microbial Safety for Drinking: Though drinking water standards are rigorously stringent in controlling microbial contamination (coliform bacteria), hence exempting possible risks from

waterborne illnesses; irrigating water may be tolerant of some presence of microbes if it is not subjected to directly reaching human health.

Table: Comparison of Key Differences Between Irrigation and Drinking Water Standards

Parameter	Standard Organizations	Groundwater (Irrigation)	Surface Water (Irrigation)	Groundwater (Drinking)	Surface Water (Drinking)
pH	ISO, WHO, EPA	6.0 - 8.5	6.5 - 8.5	6.5 - 8.5	6.5 - 8.5
Electrical Conductivity (EC)	ISO, WHO, EPA	< 3000 ÂµS/cm	< 2500 ÂµS/cm	< 1500 ÂµS/cm	< 1500 ÂµS/cm
Total Dissolved Solids (TDS)	ISO, WHO, EPA	< 2000 mg/L	< 2000 mg/L	< 1000 mg/L	< 500 mg/L
Turbidity	ISO, WHO, EPA	< 5 NTU	< 5 NTU	< 1 NTU	< 1 NTU
Hardness (as CaCOâ,*f*)	ISO, WHO, EPA	< 500 mg/L	< 300 mg/L	< 300 mg/L	< 300 mg/L
Chloride	ISO, WHO, EPA	< 600 mg/L	< 600 mg/L	< 250 mg/L	< 250 mg/L
Nitrate	ISO, WHO, EPA	< 50 mg/L	< 50 mg/L	< 50 mg/L	< 50 mg/L
Sodium	ISO, WHO, EPA	< 200 mg/L	< 200 mg/L	< 200 mg/L	< 200 mg/L
Fluoride	ISO, WHO, EPA	< 1.5 mg/L	< 1.5 mg/L	< 1.5 mg/L	< 1.5 mg/L
Dissolved Oxygen (DO)	ISO, WHO, EPA	> 5 mg/L	> 5 mg/L	> 6 mg/L	> 6 mg/L
Biochemical Oxygen Demand (BOD)	ISO, WHO, EPA	< 10 mg/L	< 10 mg/L	< 5 mg/L	< 5 mg/L

Turbidity Problems: Drinking water needs to have very low turbidity (<1 NTU) for it to be clear and safe, but it may be more tolerant of high turbidity as irrigation does not adversely affect plant health.

Concentration of Dissolved Oxygen (DO): Drinking water should preserve a high concentration of dissolved oxygen to be fresh and palatable. Aquatic Irrigation water need not be overly specific about DO unless used in aquaculture.

Chemical Residue: Those pesticides and fertilizers allowed in irrigation water have more lenient standards than drinking water, which is supposed to carry no detectable chemical residue for the public.

Heavy Metals: The allowable heavy metals, including lead and mercury, and arsenic is much lower in drinking water but just a little higher in the standard set for irrigation water if they will not have potential interference to crops and soil crops in the long run.

Conclusion

There is a great need to ensure that all parameters of water quality meet these requirements for the proper living of people and agricultural productivity. There is a wide range of

differences in the quality of the given groundwater and surface water, and knowledge of such variations assists appropriately in the management of water resources. The adoption of ISO, WHO, and EPA standards ensures that waters meant for drinking are pure enough while that applied for irrigation maintains healthy crops without soil deterioration. Continuous monitoring regulation is therefore important to help maintain such standards of high quality for waters for generations to come.

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