

5. Mineral Water Vs Packaging Drinking Water - Geography

The consumption of mineral and packaged water has become a global standard for safety and health. Understanding the nuances between natural mineral water, packaged drinking water, and municipal tap water is essential for making informed dietary and lifestyle choices.

1. Background

What is Mineral Water?

Natural mineral water is defined by its origin and its untouched chemical nature. Unlike ordinary drinking water, it is characterized by its purity at the source and its specific content of mineral salts and trace elements.

Source Specificity - It must originate from a geologically stable underground strata, emerging from a natural spring or a bored well.

Natural Composition - The minerals (calcium, magnesium, potassium, etc.) are not added; they dissolve into the water naturally as rainwater seeps through layers of rock like limestone or volcanic basalt.

Zero Chemical Treatment - Under global and Indian standards, the mineral composition of "Natural Mineral Water" cannot be chemically altered or treated, preserving its original "terroir."

Key Water Classifications (Global Standards)

The U.S. FDA and international bodies categorize bottled water based on its source and treatment -

Artesian Water - Groundwater trapped under pressure between layers of rock, which naturally rises to the surface when tapped.

Spring Water - Water derived from an underground formation from which water flows naturally to the surface.

Purified Water - Water produced by distillation, deionization, or reverse osmosis (RO).

Packaged Drinking Water - Water derived from any source (tap or ground) that undergoes intensive purification (RO, UV) and may have minerals manually added back for taste.

2. Comparison of Water Types

The following table differentiates between common water types based on their purity, minerals, and primary usage.

Feature	Natural Mineral Water	Packaged Drinking Water	Municipal Tap Water	Distilled Water
Source	Underground (Spring/Well)	Tap or Groundwater	Rivers, Lakes, Borewells	Any water (boiled)
Treatment	Minimal (Filtration/UV)	Intensive (RO/Chemical)	Alum/Filtration /Chlorine	Distillation/Demineralization
Mineral Content	High (Naturally present)	Controlled (Added back)	Varies by region	None (Pure H ₂ O)
ISI Standard	IS 13428	IS 14543	IS 10500 -2012	N/A
Taste	Distinctive/Mineral-rich	Neutral/Consistent	Regional variation	"Hollow" or flat
Primary Use	Health/Premium Drinking	General Consumption	Household/Daily Use	Lab/Industrial/Medical

3. Production and Regulation of Tap Water in India

Tap water is a state subject in India, and its production is tailored to the high pathogen loads found in tropical climates.

Source & Treatment - Primarily sourced from rivers or deep borewells.

Disinfection Process - Coagulation - Alum is added to clump dirt and particles together for filtration.

Chlorination – Residual chlorine is added in excess to ensure the water remains safe even if it encounters leaks or sewage contamination during transit through aging pipes.

Regulatory Limits – Standards are set by IS 10500 –2012.

TDS (Total Dissolved Solids) – The ideal limit is 500 mg/l, but it can be extended up to 2,000 mg/l in areas with no alternative water source.

4. The Mineral Water Lifecycle – From Rock to Bottle

Formation and Sourcing

The journey of mineral water begins with environmental precipitation –

Seepage – Rain and snowmelt filter through rocks (granite, sandstone, etc.).

Dissolution – Water absorbs minerals from these rocks over decades or centuries.

Pressure – Underground pressure pushes the enriched water toward subterranean reservoirs.

Extraction – Producers drill wells or tap springs to collect this water without disturbing the ecosystem.

Production and Packaging

Bottling at Source – Mandatory to prevent the loss of natural properties.

Physical Processing – Limited to filtration (removing grit/iron) and UV disinfection.

Carbonation – Carbon dioxide levels may be adjusted to create "sparkling" water.

Packaging Materials –

Glass – Safe and inert but heavy and fragile.

PET – Convenient, but prone to leaching microplastics if exposed to heat.

Aluminium – Highly recyclable, but contains an internal plastic lining that may leach chemicals.

5. Certification and Quality Standards in India

Selling mineral water in India requires the most stringent compliance in the food industry.

Dual Licensing – A producer must hold both an FSSAI license and a BIS (Bureau of Indian Standards) certificate.

Mandatory ISI Mark – Every bottle must display the ISI Mark (IS 13428).

Label Disclosures – Labels must explicitly state the source location and the levels of specific minerals present.

Prohibition of Claims – Packagers are strictly forbidden from claiming "medicinal" or "healing" properties, regardless of mineral content.

6. Role of Minerals and Health Impact

Minerals define the "mouthfeel" and health profile of the water –

Calcium – Provides a smooth, chalky sensation; supports bone density.

Magnesium – Adds a subtle bitterness; aids muscle and nerve function.

Bicarbonates – Neutralize acidity and provide a sweet finish; aid digestion.

Sodium & Sulphates – Provide saline notes and a "crisp" finish, respectively.

Hardness vs. Softness –Hard Water – High in Calcium/Magnesium (Found in Rajasthan, Gujarat, Delhi). It creates scale in appliances and resists soap lather.

Soft Water – Low mineral content (Found in Mumbai, Kerala, Himalayan regions).

Source – <https://www.thehindu.com/sci-tech/science/what-is-mineral-water-and-how-does-it-naturally-contain-dissolved-minerals/article70784506.ece>