

Heavy Metals Contaminating Indian Rivers

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In news: A study conducted by Central Water Commission(CWC) shows that two-thirds of the water quality stations spanning India's major rivers showed contamination by one or more heavy metals

What are the key findings?

Following are the key findings of the study:

- As per the study conducted by CWC from May 2014 to April 2018, samples taken from two-thirds of the water quality stations spanning India's major rivers showed contamination by one or more heavy metals, exceeding safe limits set by the Bureau of Indian Standards.
- Samples from only one-third of water quality stations were safe.
- **More heavy metals:** The rest, or 287 (65%) of the 442 sampled, were polluted by heavy metals.
- **More Iron:** Iron emerged as the most common contaminant with 156 of the sampled sites registering levels of the metal above safe limits.
- **Arsenic:** None of the sites registered arsenic levels above the safe limit. Arsenic contamination is a major environmental issue that affects groundwater. However, the CWC exercise was restricted to surface water.
- The presence of metals in drinking water is to some extent unavoidable and certain metals, in trace amounts, required for good health. However when present above safe limits, they are associated with a range of disorders.
- **Health related problems:** Long-term exposure to the above-mentioned heavy metals may result in slowly

progressing physical, muscular, and neurological degenerative processes that mimic Alzheimer's disease, Parkinson's disease, muscular dystrophy and multiple sclerosis.

- **Other contaminants:** The other major contaminants found in the samples were lead, nickel, chromium, cadmium and copper.
 - Lead, cadmium, nickel, chromium and copper contamination were more common in non-monsoon periods while iron, lead, chromium and copper exceeded 'tolerance limits' in monsoon periods most of the time
 - **The study:** Arsenic and zinc are the two toxic metals whose concentration was always obtained within the limits throughout the study period
 - **Rivers covered:** Not all the rivers are equally sampled. Several rivers have only been sampled at a single site whereas others such as the Ganga, the Yamuna and the Godavari are sampled at multiple sites.
 - **Sources of heavy metal pollution:** The main sources of heavy metal pollution are mining, milling, plating and surface finishing industries that discharge a variety of toxic metals into the environment.

Reasons for contamination: The reasons for contamination, according to the authors of the report, were "population growth and rise in agricultural and industrial activities".

Do you know?

- Heavy metals are generally defined as metals with relatively high densities, atomic weights, or atomic numbers.
- Heavy metals are usually present in trace amounts in natural waters but many of them are toxic even at very low concentrations

- Metals such as arsenic, lead, cadmium, nickel, mercury, chromium, cobalt, zinc and selenium are highly toxic even in minor quantities.
- Heavy metals are known to be naturally occurring compounds, but anthropogenic activities introduce them in large quantities in different environmental compartments