

# Industrial effluents behind Yamuna's heavy metal woes

## HEALTH ALARM

- > Sources of toxic heavy metals in the Yamuna primarily of anthropogenic origin
- > Waste water released from industries is a major source
- > Concentration of chromium, nickel, copper, zinc, cadmium and lead were below the detection limit during the first lockdown
- > Iron and manganese come from both natural and anthropogenic sources

## IMPACT ON HEALTH

- > Can affect all body parts, including lungs, kidneys, liver, skin, muscles, reproductive system and immune system
- > Effect on humans based on nature, concentration and duration of exposure



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## ORGANS THAT MAY BE AFFECTED

**CHROMIUM** | Gastrointestinal, skin, liver, kidney, hematology

**LEAD** | Bones, reproductive, immunological, brain

**CADMIUM** | Bones, immunological, kidney, respiratory

**IRON** | Gastrointestinal, immunological, cardiovascular, liver



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**New Delhi:** The sources of toxic heavy metals in the Yamuna in Delhi region are primarily of anthropogenic origin, according to a new study conducted by The Energy Resources Institute (TERI).

The study, which is based on an analysis of Yamuna water samples collected during the first Covid-19 lockdown, says that as industries were closed during that period, the concentration of toxic heavy metals, such as chromium, nickel, copper, zinc, cadmium and lead, were seen to be below the detection limit.

However, several previous studies continuously found high levels of toxic metals in the river before the lockdown, suggesting that wastewater released from industries is the main source of heavy metals in the Yamuna. The study has recommended necessary policy action to control the heavy metal-laden industrial discharge into the river.

According to the study, a 22km-long stretch running downstream from Wazirabad to Okhla barrage contributes more than 50% of the Yamuna pollution load. In this par-

ticular segment, the river receives pollutants from several point sources (industrial discharge and municipal sewage), non-point sources (agricultural runoff) and untreated wastewater from drains. The study says the river stretch before entering Delhi collects discharge from 22 industrial units from Haryana and 42 units of Delhi.

## STUDY SAYS

**As urban sewage is likely to remain the same even during the lockdown, industrial wastewater release into the Yamuna is expected to be less or almost nil**

The study also mentions another 2012 survey that found elevated concentrations of heavy metals, including chromium, manganese, iron, nickel, copper, zinc, arsenic and lead, in Yamuna water, as well as previous research which found regular concentration on the basis of samples collected till 2018.

"Significant higher concentrations of heavy metals can be noted in all these previous studies. This reflects a

direct correlation between industrial activities and heavy metals in the Yamuna water of Delhi stretch," says the latest study.

It adds, "As urban sewage is likely to remain the same even during the lockdown, industrial wastewater release into the Yamuna is expected to be less or almost nil. Thus, this study provides preliminary evidence for the anthropogenic origin of the heavy metals causing pollution in the water of Yamuna in Delhi. However, iron and manganese can arise from natural as well as anthropogenic sources."

Dr Kanhaiya Lal, associate fellow, environment and health, TERI, and the corresponding author of the study, said, "The heavy metals are toxic and non-degradable and have serious health effects on humans. They can affect all parts of the body, including lungs, kidneys, liver, skin, muscles, reproductive and immune system, depending on the nature and concentration of heavy metals and duration of exposure."

The other authors of the study, which was published in Journal of Indian Association for Environmental Management, are Meena Sehgal and Mahima Uttreja from TERI.