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Q7

Industrial pollution of river water is a significant environmental issue in India. Discuss the various mitigation measures to deal with this problem and also the government's initiative in this regard.

UPSC Civil Services Mains 2024 · GS III · 10 marks · Environment and Conservation

Conservation, environmental pollution and degradation, environmental impact assessment.

Core demand of the question

- Discuss mitigation measures for industrial pollution of Indian rivers
- Discuss government initiatives on the same problem
- Keep law, technology and basin missions together

Revision summary

Industrial river pollution in India comes from tanneries, textiles, chemicals and similar clusters on living rivers.

Mitigation is source control, CETPs, **ZLD** where needed, online monitoring, zoning and closure under the Water Act.

Namami Gange, CPCB's grossly polluting industry list, CEPI cluster scores and **NGT basin** orders are the main public initiatives.

Sewage and industry mix, so a river mission that ignores either fails.

The binding constraint is enforcement at night, not the absence of a statute.

Introduction

Indian rivers take **factory effluent** as well as sewage. Tanneries, textiles, distilleries, paper, chemicals and electroplating have turned stretches of the **Ganga, Yamuna, Damodar, Patancheru streams and Pali** into industrial drains. Mitigation is not one machine. It is a **standard, a pipe, a plant, a court and a closure power**. The government's initiatives only work if those five stay joined.

Body**Mitigation measures**

- **The first measure is** prevention at source: cleaner processes, less water per unit of cloth or leather, and a ban on the worst chemistries. The second is **treatment: common effluent treatment plants** for clusters of small units that cannot each afford a plant, and **zero liquid discharge** where the basin is already dead. **Online continuous effluent monitoring**, linked to the pollution board, makes a midnight bypass harder. **Zoning** keeps new dirty industry off a floodplain. **Polluter-pays cess**, bank guarantees and **closure under the Water Act** are the teeth. **Environmental flows** and wetland buffers dilute what still escapes, but dilution is not a licence to dump. **Community sampling** and river-basin data close the gap between a consent

order and the actual colour of the water.

- **Peg:** CETPs for tannery and textile clusters, with **ZLD** in critically polluted industrial areas, are the standard engineering answer.
- **Peg:** The Water (Prevention and Control of Pollution) Act, 1974, and EPA, 1986, already allow consent, direction and closure.

Government initiatives

Namami Gange is the flagship basin mission: sewage plants, industrial cluster work, river-front and biodiversity, with the **National Mission for Clean Ganga** as the vehicle. **CPCB and SPCBs** set effluent standards and run the **Grossly Polluting Industries** list on the Ganga main stem. The **National Green Tribunal** has passed basin-wide orders on Yamuna and Ganga, including industrial inspection. **Critically polluted industrial clusters** were scored so that expansion could be frozen until CEPI improved. **Amritsar to Ganga is not the whole map: Yamuna Action Plans**, State river programmes, and **extended producer** logic for some wastes sit beside it. The gap is **enforcement**: a **CETP** that is switched off at night, a board that is under-staffed, and municipalities that still pour sewage, which then mixes with industry so the public cannot see who poisoned the stretch.

- **Peg:** **Namami Gange** plus the **GPI** inventory is the Ganga industrial track; NGT orders are the judicial track.
- **Peg:** Technology without a working SPCB is a plant on paper.

Flow diagram

Industrial effluent -> CETP ZLD cleaner process
CETP ZLD cleaner process -> River stretch
Water Act SPCB NGT -> Industrial effluent
Namami Gange GPI -> CETP ZLD cleaner process
Enforcement gap -> River stretch

Conclusion

Industrial river pollution is mitigated by cleaner processes, CETPs, **ZLD**, online monitoring and closure powers. Government missions and tribunals have built the kit. The river improves only where that kit is switched on every night, not only on a foundation-stone day.

Facts & figures

Water Act, 1974

Parent pollution statute: consent to discharge, sampling, and board directions, with later closure powers in practice via EPA as well.

Namami Gange

The Union's integrated Ganga programme, including industrial cluster and sewage components under NMCG.

CETP

Common effluent treatment plant for many small units that cannot each run a full treatment line.

ZLD

Zero liquid discharge, used in some critically polluted textile and tannery belts so treated water is reused, not returned to the drain.

GPI

Grossly Polluting Industries on the **Ganga basin**, inventoried for inspection and compliance.

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