

DATE: 15 OCTOBER 2026

1 Nord Stream Pipeline (Source: The Indian Express)

- **What is it?:** Nord Stream is a pair of subsea natural-gas pipelines under the Baltic Sea, built to carry Russian gas directly to Germany and the wider European market.
- **Branches**
 - **Nord Stream 1:** Vyborg in Leningrad (Russia) to Lubmin near Greifswald, Germany.
 - **Nord Stream 2:** Ust-Luga (Russia) to Lubmin (Germany).
- **Passing Region:** The Nord Stream crosses the Exclusive Economic Zones (EEZs) of several countries, including Russia, Finland, Sweden, Denmark, and Germany, and the territorial waters of Russia, Denmark, and Germany.





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2 Kigali Amendment (Source: The Indian Express)

The Kigali Amendment to the Montreal Protocol is an international agreement to gradually reduce the consumption and production of hydrofluorocarbons (HFCs). It is a legally binding agreement designed to create rights and obligations in international law.

- **Fact:** Parties adopted the Kigali Amendment on 15 October 2016 in Kigali, Rwanda, and it entered into force on 1 January 2019.
- **Targets:**
 - By 2045, the parties are projected to have reduced the production and consumption of hydrofluorocarbons (HFCs) by about 80–85% from their respective baselines.
 - By 2100, this phase-down is anticipated to stop the rise in the world average temperature by up to 0.5 °C.
- **Major Provisions**
 - **HFC Phase-down:** Countries must progressively reduce HFC production and consumption according to agreed schedules.
 - **Differentiated Responsibilities:** Developed and developing countries follow different phase-down timelines.
 - **Financial Assistance:** The Multilateral Fund under the Montreal Protocol supports eligible developing countries in transitioning to alternatives.
 - **Technology Transition:** Encourages adoption of energy-efficient, low-GWP refrigeration and cooling technologies.
 - **Monitoring and Reporting:** Parties must report HFC production and consumption and implement licensing systems.
- **Note:** India officially ratified the Kigali Amendment on September 27, 2021.

3 Chromium Pollution (Source: Down To Earth)

Chromium Pollution

Chromium pollution refers to the contamination of air, water and soil by chromium and its compounds, mainly from industrial, mining and waste sources, leading to serious environmental and health risks.



What is Chromium?

- Chromium (Cr) is a naturally occurring metal found in rocks, soil, water and living organisms.
- It exists mainly in two oxidation states:
 - Trivalent Chromium (Cr^{3+})** – less toxic, essential in small amounts for living organisms.
 - Hexavalent Chromium (Cr^{6+})** – highly toxic, carcinogenic and major environmental concern.



Major Sources



Leather tanning industry
use of chromium salts in tanning process



Industrial effluents
metal plating, stainless steel production, pigments, dyes, chemicals



Mining and smelting
release of chromium in mines and processing units



Improper waste disposal
industrial waste, fly ash, solid waste and sewage sludge

Forms in Environment

Trivalent Chromium (Cr^{3+})



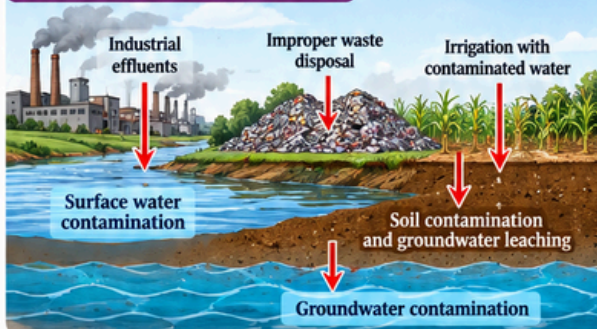
- Less mobile and less toxic
- Forms stable compounds
- Essential in trace amounts for metabolism

Hexavalent Chromium (Cr^{6+})



- Highly soluble and mobile
- More toxic and carcinogenic
- Readily enters water, soil and food chain

Pathways of Pollution



Environmental Impacts



- Water bodies**
- Toxic to aquatic life, reduces biodiversity
 - Bioaccumulation in fish
 - Contaminates drinking water sources



- Soil**
- Reduces soil fertility and microbial activity
 - Affects crop growth and yield
 - Accumulation in agricultural soils



- Plants and ecosystem**
- Inhibits seed germination and plant growth
 - Enters food chain causing ecological risks

Health Impacts on Humans



Carcinogenic
Prolonged exposure to Cr^{6+} can cause lung cancer and nasal cancer



Respiratory problems
Irritation, asthma, bronchitis



Skin problems
Dermatitis, ulcers, allergic reactions (especially in workers)



Gastrointestinal issues
Nausea, vomiting, abdominal pain (from contaminated water/food)



Kidney and liver damage
Long-term exposure can affect internal organs

Control and Mitigation Measures



Effluent treatment
using chemical reduction, precipitation, adsorption and membrane technologies



Safe waste management
proper disposal of industrial and mining waste



Cleaner production technologies
recycling of chromium and substitution with less hazardous alternatives



Monitoring and regulation
strict enforcement of discharge standards



Occupational safety
use of protective equipment and regular health check-ups



Remediation of contaminated sites
soil and groundwater clean-up technologies