Desalination Plants Harm Environment: UN

According to a **U.N. backed study,** desalination plants across the world produce **highly salty waste water** and **toxic chemicals** that are damaging the environment.

- This study was part of research into how best to secure fresh water for a rising population without harming the environment.
- Desalination plants around the world are pumping out far more **salt laden brine** than previously believed. The brine raises the level of salinity and poses a major risk to ocean life and marine ecosystems.
- Brine, water comprising **about 5% salt,** often includes toxins such as **chlorine and copper** used in desalination. By contrast, global **seawater is about 3.5% salt.**
- More than half the brine comes from **four middle eastern countries**. These are Saudi Arabia, the United Arab Emirates, Kuwait and Qatar, with **Saudi Arabia alone responsible for 22% of the effluent.**

Desalination

Desalination is the process of **removing salts from water** to produce water that meets the quality (salinity) requirements of different human uses. Seawater desalination can extend water supplies beyond what is available from the hydrological cycle, providing an “unlimited”, climate-independent and steady supply of high-quality water.

Background

- The “conventional” sources of water such as rainfall, snow-melt and river runoff captured in lakes, rivers, and aquifers are no longer sufficient to meet human demands in water-scarce areas. This is in direct conflict with **Sustainable Development Goal (SDG) 6**, aimed at ensuring the **availability of clean water for current and future generations.**
- While water demand mitigation approaches such as water conservation and improved efficiencies can somewhat close the water demand and supply gap, these approaches

must be combined with supply enhancement strategies in order to combat water scarcity.
- Among the water supply enhancement options, desalination of sea-water and highly brackish water has received the most consideration and is increasingly seen as a viable option to meet primarily domestic and municipal needs.

Impacts

- There is an **increase in the temperature** of this zone of the sea, together they **decrease the dissolved oxygen level**, which is called **hypoxia** and that impacts the aquatic life in that zone.
- Hypoxia often leads to the formation of dead zones in the oceans. These zones have quadrupled since 1950, mainly as a result of climate change. Now the **excess salt is adding** to these problems.
- Since **brine is denser than seawater,** it sinks to the seafloor and disrupts vibrant communities of life, which find themselves wanting far less salt and far more oxygen.
- Desalination requires **large amount of energy to process seawater,** which is met by burning fossil fuels **contributing to global warming.**
- Compounding the problem is the ongoing expansion of desalination as more and more countries turn to the technology in the face of climate change which is exacerbating water shortages.

Opportunities

- The discharge (brine) can also contain precious **elements like uranium, strontium as well as sodium and magnesium** which have the **potential to be mined.**
- Brine has been used for **aquaculture, with increases in fish biomass of 300%.** It has also been successfully used to cultivate the dietary supplement Spirulina, and to irrigate forage shrubs and crops.
- There is a need to convert an **environmental problem into an economic opportunity.** This is particularly important in countries producing large volumes of brine with relatively low efficiencies.

Conclusion

- Due to the relatively high economic costs, desalination is currently concentrated in high income and developed countries.
- There is a need to make desalination technologies more affordable and extend them to low income and lower middle income countries, increasing the viability of desalination for addressing SDG 6 in areas that developments have previously been limited by high economic costs.
- To do this, technological refinement for low environmental impacts and economic

costs, along with innovative financial mechanisms to support the sustainability of desalination schemes, will likely be required.