

## **2. No relief to RO companies from Supreme Court**

**Prelims Level:** Pollution & Waste Management

**Mains Level:** GS-III Conservation, Environmental Pollution and Degradation, Environmental Impact Assessment.

### **Why in News?**

- The Supreme Court has refused to stay the May 2019 order of the National Green Tribunal (NGT) that banned the use of reverse osmosis (RO) systems where drinking water supply had total dissolved solids (TDS) less than 500 mg per litre.

### **About:**

- In May, the National Green Tribunal (NGT) asked MoEFCC to frame rules for the use of RO filters and also banned the use of RO purifiers in locations where TDS was low.
- According to NGT, RO purifiers lead to the wastage of almost 70-80 percent water during the purification process.
- It had asked the RO manufacturers to ensure that they are able to recover about 75 percent of the water. Following this, the Water Quality India Association moved the SC to seek a stay on the RO ban. However, the apex court refused to give a stay.

### **What is Osmosis and Reverse Osmosis?**

- A process by which molecules of a solvent tend to pass through a semi permeable membrane from a less concentrated solution into a more concentrated one is known as Osmosis.
- A process by which a solvent passes through a porous membrane in the direction opposite to that for natural osmosis when subjected to a hydrostatic pressure greater than the osmotic pressure is known as Reverse Osmosis.

### **Challenges in RO System:**

- Deposition of brine (highly concentrated salt water) along the shores.
- Hyper salinity along the shore affects plankton, which is the main food for several of these fish species. The high pressure motors needed to draw in the seawater end up sucking in small fish and life forms, thereby crushing and killing them — again a loss of marine resource.
- Construction of the RO plants required troves of groundwater. Freshwater that was sucked out and is replaced by salt water, rendering it unfit for the residents around the desalination plants.

- On an average, it costs about ₹900 crore to build a 100 MLD-plant and, as the Chennai experience has shown, about five years for a plant to be set up.
- To remove the salt required, there has to be a source of electricity, either a power plant or a diesel or battery source. Estimates have put this at about 4 units of electricity per 1,000 litres of water. It is estimated that it cost ₹3 to produce 100 litres of potable water.
- There are concerns that desalinated the RO water may be short of vital minerals such as calcium, magnesium, zinc, sodium, potassium and carbonates.
- Most RO plants put the water through a 'post-treatment' process whereby salts are added to make TDS around 300 mg/l.

### **How Challenges can be Addressed?**

- There are few other alternative techniques to purify this water.
- Ocean Thermal Energy Conversion: It will draw power from the vapour generated as a part of the desalination process.
- This vapour will run a turbine and thereby will be independent of an external power source.
- While great in theory, there is no guarantee it will work commercially.
- For one, this ocean-based plant requires a pipe that needs to travel 50 kilometres underground in the sea before it reaches the mainland.
- Low-temperature thermal desalination (LTTD) technique works on the principle that water in the ocean 1,000 or 2,000 feet below is about 4° C to 8° C colder than surface water.
- So, salty surface water is collected in a tank and subject to high pressure (via an external power source).
- This pressured water vapourises and this is trapped in tubes or a chamber.
- Cold water plumbed from the ocean depths is passed over these tubes and the vapour condenses into fresh water and the resulting salt diverted away.