Uranium Contamination in Ground Water

What is the issue?

- Reports of widespread uranium contamination in groundwater across India demand an urgent response.
- Groundwater contamination across India must be probed and mapped, and safe sources need to be identified.

What is the scenario of uranium contamination?

- **Evidence** - A recent study, has found over 30 micrograms per litre (mcg/l) of the heavy metal in parts of north-western, southern and south-eastern India.
- Reports of uranium contamination has cropped up across India in recent years, with south Bangalore recording 2000 mcg/l of uranium in groundwater.
- Previously, regions of Andhra Pradesh and Telangana were found to have over 500 mcg/l of uranium in their aquifers.
- More recently, parts of Gujarat and Rajasthan recorded undesirable uranium levels in their waters.
- **Regulations** - Drinking such water can damage one’s kidneys, and the World Health Organization (WHO) prescribes '30 mcg/l' as an upper limit.
- But unfortunately, the residents of the regions surveyed were using wells recording far greater uranium levels as their main source of drinking water.
- Significantly, as the “Bureau of Indian Standards” does not specify a norm for uranium level, water is not tested regularly for it.
What are the health effects?

- Preliminary studies on the health effects of drinking uranium-tainted water among animals and humans have revealed that it causes kidney damage.
- Notably, this is said to be caused by the chemical effect of uranium, rather than a radiological, even though uranium is radioactive.
- Nonetheless, we need more comprehensive systematic studies to establish the chronic health effects of uranium exposure.

How does uranium enter ground water?

- The mechanism by which uranium enters groundwater is still under research.
- Two types of terrains have been identified with heavy contamination, namely:
  - Alluvial aquifers in Rajasthan and other north-western regions
  - Crystalline rocks such as granite in southern regions like Telangana.
- Some researchers have hypothesized that over-extraction of ground water exposes uranium to air, which triggers its release from the rocks.
- Further research is needed in this regard as it would help in identifying regions where safer water can be found.
- Notably, even information of how uranium accumulated with the rocks (during sedimentation), would help in estimating the regions of prevalence.