



Radioactive Materials in Recycling Chain

For Prelims: International Atomic Energy Agency (IAEA), IAEA Nuclear Security Plan, Nobel Peace Prize, United Nation General Assembly, UPSC, IAS, Civil Services Examination.

For Mains: Issues Related to Radioactive Materials, International Atomic Energy Agency.

Why in News?

The [International Atomic Energy Agency \(IAEA\)](#), has released its annual data on **illicit trafficking of nuclear and other radioactive material**.

- The data shows that **radioactive materials or contaminated devices** are entering into the **booming scraps recycling chain, posing a grave health hazard**.

What does the IAEA Data Suggest?

- The **IAEA's Nuclear Security Plan** was established to **report incidents of illicit trafficking of nuclear and other radioactive material**.
- The latest dataset shows that **incidents of unauthorised disposal of radioactive sources** slipping into scrap metal or waste recycling industries are increasing.
 - The occurrence of such incidents indicates deficiencies in the systems to **control, secure and properly dispose of radioactive material**.
- The resulting contaminated metal, if used to **manufacture household goods**, could pose a **potential health problem to unsuspecting consumers**.
 - IAEA reported **146 incidents in 2022**, which is an increase of nearly 38% over the 2021 figure.

What Measures can be Taken to Prevent Radioactive Materials from Entering the Recycling Chain?

- **Strengthen Regulatory Frameworks:** Governments need to strengthen their regulatory frameworks and enforcement mechanisms to ensure **proper handling, storage, and disposal of radioactive materials**.
 - This can include **stricter licensing requirements for facilities that handle radioactive materials**, and penalties for non-compliance.
- **Improve Monitoring and Control Mechanisms:** Governments should also invest in improving monitoring and control mechanisms to **prevent the illicit trafficking of nuclear and radioactive materials**.
 - This can include the **use of radiation detection equipment at borders and other points of entry**, and more **comprehensive tracking and reporting systems**.
- **Encourage the Use of Alternative Materials:** Governments and other stakeholders should encourage the **use of alternative materials that do not pose a risk of radioactive contamination** and promote the development of technologies to extract valuable materials from radioactive waste in a safe and sustainable manner.

What is Radioactivity?

- Radioactivity is the phenomenon of **spontaneous emission of particles or waves from the unstable nuclei of some elements**. There are three types of radioactive emissions: **Alpha, Beta and Gamma**.
 - Alpha particles are positively charged **He (Helium) atoms**, beta particles are negatively charged electrons and gamma rays are neutral electromagnetic radiations.
- Radioactive elements are **naturally found in the earth's crust**. **Uranium, thorium and actinium** are three NORM (Naturally Occurring Radioactive Materials) series that contaminate water resources.
- Radioactivity is measured in **Becquerel (SI unit) or in Curie**. The unit **Sievert measures the quantity of radiation absorbed by human tissues**.

International Atomic Energy Agency

- **About:**
 - Widely known as the world's **"Atoms for Peace and Development"** organisation within the [United Nations family](#), the IAEA is the international centre for **cooperation in the nuclear field**.
- **Establishment:**
 - The IAEA was created in 1957 in response to the deep fears and expectations generated by the **discoveries and diverse uses of nuclear technology**.
 - Headquarter: **Vienna, Austria**.
- **Objective:**
 - The Agency works with its Member States and multiple partners worldwide to promote safe, secure and peaceful use of nuclear technologies.
 - In 2005, it was awarded the [Nobel Peace Prize](#) for their work for a safe and peaceful world.
- **Functions:**
 - It is an independent international organisation that reports annually to the [United Nation General Assembly](#).
 - When necessary, the IAEA also reports to the [UN Security Council](#) in regards to instances of members' non-compliance with safeguards and security obligations.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Q. In the Indian context, what is the implication of ratifying the 'Additional Protocol' with the 'International Atomic Energy Agency (IAEA)'? (2018)

- (a) The civilian nuclear reactors come under IAEA safeguards.
- (b) The military nuclear installations come under the inspection of IAEA.
- (c) The country will have the privilege to buy uranium from the Nuclear Suppliers Group (NSG).
- (d) The country automatically becomes a member of the NSG.

Ans: (a)

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