Prelim Bits 16-06-2023 | UPSC Daily Current Affairs

Space Industry Debris Mitigation Recommendations

The World Economic Forum (WEF) and the European Space Agency (ESA) jointly released the Space Industry Debris Mitigation Recommendations to mitigate the space debris problem.

Space Debris

- It is any piece of machinery or debris left by humans in space.
- It can refer to dead satellites, bits of debris or paint flecks that have fallen off a rocket.

> *The Kessler syndrome is a scenario in which the density of objects in Low Earth Orbit (LEO) is high enough that collisions between objects could cause a cascade that increases the likelihood of further collisions*

- **Russia** has the most space debris with over 7000 rocket bodies floating in space.

WEF Guidelines

- The guidelines are not exactly rules, and are, therefore, non-binding.
- **Post-mission disposal (PMD) -** The guidelines say that spacecraft operators try to get satellites removed from low-Earth orbit within *5 years* after the end of the mission.
- In case operators are not able to maintain control of the satellite and de-orbit it, they must ensure that it does not turn into space debris.
- **Collision avoidance systems -** Missions that orbit above an altitude of *375 kilometres* should have an ability to actively manage the orbit.
- The guidelines encourage a *propulsion-based system* but other technologies could be more appropriate depending on the situation.
- **Data sharing and traffic management -** Every satellite operator should try to proactively coordinate with other operators and entities to create operational coordination agreements and space situational awareness information-sharing.
- **Financial measures -** Third-party liability insurance organizations should consider incentives for sustainable missions, and appropriate safety measures should be implemented
- **Environmental Capacity -** It encourages industry players to further study the objects in orbit—the population, evolution, and the interaction between them.
- **Long-term goals -** This includes asking governments to require by 2030 that all space missions have capabilities to remove satellites from orbit within 5 years of the end of mission.

Countries	Space Debris Mission
Europe	ClearSpace-1
INDIA	NETRA Project
Japan	Elsa-D
EU	RemoveDebris
USA	NASA Orbital Debris Program

Reference

The Indian Express | World-economic-forum-space-debris

Justice Clock

Recently, Justice Clocks have been installed across the court complexes of high courts.

- Justice Clock is a LED display message sign board system (electronic signage system).
- It is to make effective use of database created through *National Judicial Data Grid (NJDG)* and to make the information available to public.
- **Initiative of** Ministry of Law and Justice.
- **Aim** – To bring awareness to the public about justice sector, advertising the various schemes of the department and to give status of various fields to the public.
- **Contents displayed** - The clock will display the schemes of the Department of Justice and how citizens can benefit from the projects such as e-Courts, Access to Justice and Legal Aid to Poor.
- At present the following contents are being displayed
    - Live Case Status (The details of ongoing cases in respective Court rooms are displayed during Court proceedings.)
    - Case Pendency in District Courts
    - Ecourts videos
    - NJDG Public Portal and District Court Services videos
- A total of 39 Justice Clocks are functional in 25 High Courts.

Reference

PIB | Justice Clock

Sea Slaters

A new study has found that diffused light pollution in the night sky could be confusing a species of woodlouse called Sea slaters.

- Sea slaters are members of a group of crustaceans called the *Isopoda* (iso meaning “same” and pod meaning “foot”).
- It is a species of *woodlouse.*
- It is also known as the *common sea slater, or sea roach.*

- **Scientific Name** - *Ligia oceanica*.
- **Habitat** - It is semi-terrestrial and lives in *Europe and Indo-Pacific region*.
- It is found on rocky shorelines, wharf pilings, and harbor areas where it inhabits the borders of the land and sea.
- It is an herbivore and scavenger and eat dead plant and fungal matter thus acting as important "*natural recycler*".
- While sea slaters are not a threatened or vulnerable species, they play an important part in their local ecosystem.
- They search for food at night and can *change their colour* to blend in and hide themselves from predators.
- Researchers have found that diffused pollution at night can confuse these creatures, rendering their camouflage useless.

Reference

The Indian Express | Light pollution could confuse natural recycler species

Phosphorus on Enceladus

High concentrations of phosphorus have been detected by NASA's Cassini spacecraft in ice crystals spewed from the interior ocean of Saturn's moon Enceladus.

- Enceladus is a small *moon of Saturn* with an ocean of liquid water beneath its icy crust.
- It's the first time phosporous has been discovered in an ocean beyond Earth.
- Phosphorus exists in concentrations at least 100 times that of Earth's oceans, bound water-soluble forms of phosphate compounds.
- The interior ocean of Enceladus is about 1/7th the size of Earth's moon and the 6th largest among Saturn's 146 known natural satellites.
- Titan is the largest moon in Saturn and 2nd largest moon in our solar system.

Cassini Spacecraft

- It is a joint *NASA-European space agency* mission.
- Cassini-Huygens is an *unmanned spacecraft* sent to the planet Saturn in 2004.
- It is the *4th space probe* to visit Saturn (Pioneer 11, Voyager1, Voyager 2) and the *first to enter orbit*.
- Its design includes a Saturn Orbiter and a Lander called "Huygens" for the moon Titan.
- This was the first landing ever accomplished in the outer solar system.

> *According to NASA, Jupiter has 95 Moons and Saturn has 146 moons, as on May 23, 2023.*

Reference

The Indian Express | Phosphorus on Enceladus

Detox Development: Repurposing Environmentally Harmful Subsidies

A new World Bank report examines how subsidy reform can help safeguard the world's foundational natural assets.

- As per the report, subsidies for fossil fuels, agriculture, and fisheries exceed $7 trillion in explicit and implicit subsidies, which is around 8% of global GDP.
- **Inefficient subsidies on fossil fuels -** In 2021, countries shelled out $577 billion to actively lower the price of polluting fuels such as oil, gas, and coal but this amounted to incentivising the overuse of fossil fuels.
- Consequently, fossil fuel usage leads to air pollution in industrialising middle-income countries which have a high health burden.
- **Agriculture Subsidies** are targeted at farmers for buying specific inputs or growing particular crops.
- The report shows subsidies are favour to wealthier farmers, even when programs are designed to be targeted to reach the poor.
- Inefficient subsidy usage is responsible for up to 17% of all nitrogen pollution in water in the past 30 years, which has large enough health impacts on reducing labor productivity by up to 3.5%.
- **Fisheries -** The fisheries sector receives 35.4 billion per year in subsidies and contributes to overfishing.

Reference

Down to Earth | World Bank Report on Subsidies

