Mission Shakti - Space Debris

What is the issue?

- Indian PM announced that India had carried out a successful anti-satellite missile test (ASAT), Mission Shakti. Click here to know more.
- Here are the reasons why ASATs are not widely used by countries, and their implications in terms of space debris.

Why is ASAT not widely used?

- ASAT requires very advanced capabilities in both space and missile technologies that not many countries possess.
- But more than that, destroying space infrastructure like satellites is also taboo in the international community, at least till now.
- Almost every country agrees that space must not be used for wars and has spoken against weaponisation of space.
- There are also international treaties governing the use of space, mandating that, it must only be exploited for peaceful purposes.

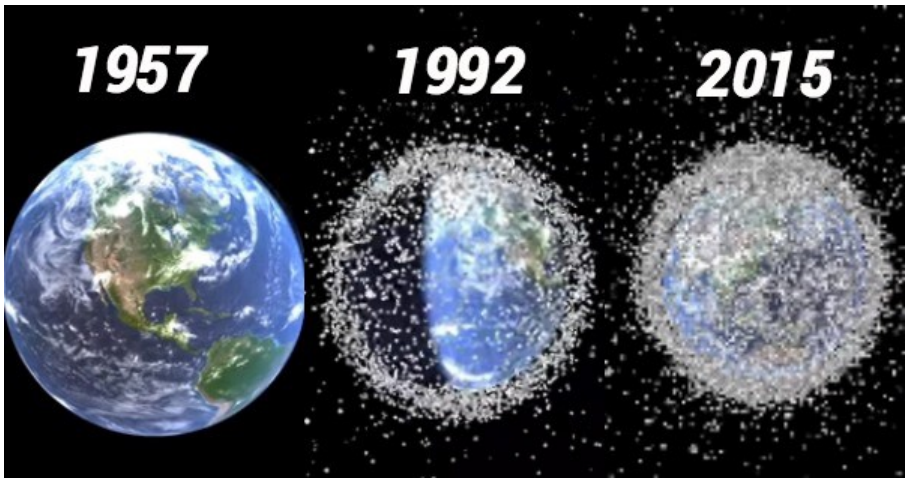
What are the international agreements in place?

- The Outer Space Treaty of 1967 prohibits countries from placing into orbit around the Earth any objects carrying nuclear weapons or other weapons of mass destruction.
- India is a signatory to the Outer Space Treaty.
- The treaty also prohibits the stationing of such weapons on celestial bodies, like the moon, or in outer space.
- It mandates that outer space, and celestial bodies like the Moon, must only be used for peaceful purposes.
- There are at least four more multilateral treaties that deal with specific concepts agreed to in the Outer Space Treaty.
- But besides these, the problem of space debris is a key reason why countries resist from destroying each other's satellites.

What is space debris?

- Anything launched into the space remains in space, almost forever, unless it is specifically brought down or it slowly disintegrates over decades or centuries.

- Satellites that are past their life and are no longer required also remain in space, orbiting aimlessly in some orbit.
- As per the recent Orbital Debris Quarterly News, published by NASA, there were 19,137 man-made objects in space that were large enough to be tracked.
- These included active and inactive satellites, rockets and their parts, and other small fragments.
- Besides these, there are millions of other smaller objects that have disintegrated from these and keep floating around in space.
- According to the European Space Agency, there were an estimated 7,50,000 objects of size one cm or above in space.
- In this context, a satellite that is destroyed by a missile disintegrates into small pieces, and adds to the space debris.



How is space debris a threat?

- Space debris is one of the principal threats to satellites as they could collide with the operational satellites and render them dysfunctional.
- E.g. China carried out its first anti-satellite missile test in 2007, destroying its Fengyun-1C weather satellite.
- This created more than 2,300 large pieces of space debris, and an estimated 1.5 lakh pieces of objects that were larger than 1 cm in size.
- Each of them could render a satellite useless on collision, and the debris damaged a functional Russian satellite.
- Debris also came close to hitting the International Space Station.
- Countries are launching more and more satellites, with each of them being a strategic or commercial asset.
- So avoiding collisions could become a challenge in the future for all.

Why is Mission Shakti safe?

- None of the international treaty or agreements technically prohibits the kind

of test that India presently carried.
- By government statement, the Indian test was done in the lower atmosphere to ensure that there was no space debris.
- So whatever debris that is generated will decay and fall back on to the earth within weeks.
- [Nevertheless, India has the technology to go deeper in the space i.e. higher orbits.]

Source: The Indian Express