Prelim Bits 15-03-2022 | Daily UPSC Current Affairs

ESA Vigil Mission

- Once known as "Lagrange," it is the upcoming **space weather mission** of European Space Agency (ESA).
- It is the first mission of its kind, set to monitor our active and unpredictable Sun and help protect us from its violent outbursts.
- The mission will give us advance warning of oncoming solar storms.
- This will have a vital role to protect Earth's infrastructure, satellites, inhabitants and space explorers from unpredictable but violent solar events like solar flares and 'Coronal Mass Ejections'.
- This mission will be launched in the mid-2020s and placed in the 5th Lagrange point orbit.

Reference

1. https://www.esa.int/Safety_Security/Space_weather/Introducing_ESA_Vigil_Earth_s_devoted_solar_defender
2. https://www.esa.int/Safety_Security/Vigil

MANPADS

The United States and NATO allies are shipping weapons into Ukraine at break-neck speed, including highly sensitive items such as Man-Portable Air-Defense Systems (MANPADS).

- Man-Portable Air-Defence Systems (MANPADS) are short-range, lightweight and portable surface-to-air missiles used to destroy aircraft or helicopters.
- [Man-Portable Anti-Tank Systems (MANPATs) work in a similar manner but are used to destroy or incapacitate military tanks.]
- MANPADS are often described as shoulder-fired anti-aircraft missiles.
- They can be shoulder-fired by individuals or small groups, or can be launched from atop a ground-vehicle, or fired from a tripod or stand, and from a helicopter or boat.
- They help shield troops from aerial attacks and are most effective in targeting low-flying aircrafts.

  The first MANPADS were introduced by the United States and Soviet Union in the 1960s.

  The most common variant of MANPADs is the U.S.-made Stinger missiles.

- **Features** - Weighing between 10 to 20 kg and not being longer than 1.8 m, MANPADS have a maximum range of 8 kilometres and can engage targets at altitudes of 4.5 km.
- Most MANPADS have passive or **'fire and forget'** guidance systems, meaning the operator is not required to guide the missile to its target, enabling them to run and relocate immediately

after firing.
- The missile stays locked-on to the targeted object, not requiring active guidance from the soldier.
- The missiles are fitted with Infrared (IR) seekers that identify and target the airborne vehicle through heat radiation being emitted by the latter.
- **Concerns** - Over time, non-state actors such as rebel and terrorist groups are known to have illicitly acquired MANPADS, using them during civil wars and other high-intensity conflicts.
- Russia is by far the biggest exporter of MANPADs, having sold over 10,000 such systems between 2010 and 2018 to various countries including Iraq, Qatar, Kazakhstan, Venezuela, and Libya.

Reference

1. https://www.thehindu.com/news/international/what-are-manpads-that-the-west-is-sending-ukraine/article65218537.ece
2. https://timesofindia.indiatimes.com/world/europe/risk-worth-taking-us-rushes-manpads-to-ukraine-despite-proliferation-concerns/articleshow/90162587.cms
3. https://www.reuters.com/world/risk-worth-taking-us-rushes-manpads-ukraine-despite-proliferation-concerns-2022-03-11/
4. https://www.armscontrol.org/factsheets/manpads

Geneva Conventions

As the evidence of casualties in the civilian population in Ukraine continues to mount due to the Russian invasion, the world will increasingly look to the Geneva Conventions.

- The Geneva Conventions of 1949 are a set of **four treaties**, formalised in 1949, and **three additional protocols**, the first two of which were formalised in 1977 and the third in 2005.
- The Geneva Conventions and their Additional Protocols codify the widely accepted ethical and legal international standards for humanitarian treatment of those impacted by any ongoing war.
- They focus of the Conventions is the **treatment of non-combatants and prisoners of war**.
- But, not the use of conventional or biological and chemical weapons, the use of which is governed respectively by the Hague Conventions and the Geneva Protocol.

Convention	**Purpose**
First Geneva Convention	It protects wounded and sick soldiers on land during war. It extends to medical and religious personnel, medical units, and medical transport.
Second Geneva Convention	It protects wounded, sick and shipwrecked military personnel at sea during war. It extends to hospital ships and medical transports by sea, with specific commentary on the treatment of and protections for their personnel.
Third Geneva Convention	It applies to prisoners of war, including a wide range of general protections such as 1. Humane treatment, maintenance and equality across prisoners, 2. Conditions of captivity, 3. Questioning and evacuation of prisoners, transit camps, food, clothing, medicines, hygiene and 4. Right to religious, intellectual, and physical activities of prisoners.
Fourth Geneva Convention	It protects civilians, including those in occupied territory.

The Fourth Geneva Convention is the most imminent convention that applies to the invasion of Ukraine by Russian military forces.

- While the Fourth Convention protects civilians, the other Conventions were concerned mainly with combatants rather than civilians.
- Along with the Additional Protocols of 1977, the Fourth Convention expounds upon
    1. The general protection of populations against certain consequences of war,
    2. The conduct of hostilities and the status and treatment of protected persons,
    3. Distinguishing between the situation of foreigners on the territory of one of the parties to the conflict and that of civilians in occupied territory.
- This convention also spells out the obligations of the occupying power vis-à-vis the civilian population and outlines detailed provisions on humanitarian relief for populations in occupied territory.
- It also contains a specific regime for the treatment of civilian internees, including three annexes on hospital and safety zones, and model regulations on humanitarian relief.
- **Signatories -** The Geneva Conventions have been ratified by 196 states, including all UN member states.
- In 2019, Russia withdrew its declaration under Article 90 of Protocol 1.
- By withdrawing this declaration, Russia has pre-emptively left itself with the option to refuse access by any international fact-finding missions to Russian entities, individuals or resources that might potentially find Russia responsible for violations of the Geneva Conventions standards.
- Further, the four conventions and first two protocols of the Geneva Conventions were ratified by the Soviet Union, not Russia.

Reference

1. https://www.thehindu.com/news/international/explained-what-are-the-geneva-conventions-guidelines-during-wartime/article65217189.ece
2. https://www.icrc.org/en/war-and-law/treaties-customary-law/geneva-conventions

Flood Plain Zoning

- Flood Plain Zoning has been recognized as an effective non-structural measure for flood management.
- It is a method of hazard mapping and land use management to assess flood risk before building on flood plains.
- Flood-plain zoning measures aim at
    1. Demarcating zones or areas likely to be affected by floods of different magnitude or frequencies and probability levels, and
    2. Specify the types of permissible developments in these zones, so that whenever floods actually occur, the damage can be minimised.
- **Advantages** - Avoiding building on high-risk flood plains, avoiding damage to property, more green space, more agriculture, increased infiltration.
- **Disadvantages** - Doesn't help areas where floodplains are already urbanised, planning issues harder to enforce in LEDCs as this is more of an MEDC solution due to technology and surveying.
- **In India**, the action for demarcation of flood plain areas and regulating the activities therein, is to be undertaken by the state governments.
- Ministry of Jal Shakti has continuously impressed upon the States the need to adopt flood plain

zoning approach.
- The states of Manipur, Rajasthan, Uttarakhand and erstwhile State of Jammu & Kashmir had enacted the flood plain zoning legislation.
- But, delineation and demarcation of flood plains is yet to be undertaken.

The Rashtriya Barh Ayog had, in 1980, estimated the total area liable to floods in the country as 40 Mha.

As per the Working Group Report on Flood Management and Region-specific Issues in 2011, the extent of maximum area affected by floods is 49.815 Mh.

Reference

1. https://pib.gov.in/PressReleasePage.aspx?PRID=1805812
2. https://alevelrivers.weebly.com/flood-management-strategies.html

Gallium nitride

Union Minister of State for Electronics & Information Technology visited the Gallium Nitride Ecosystem Enabling Centre and Incubator (GEECI) facility at the Indian Institute of Sciences (IISc), Bengaluru.

GEECI facility has been jointly set up by Ministry of Electronics and Information Technology and IISc Bengaluru aimed at establishing GaN based Development Line Foundry facility, especially for RF and power applications.

- Gallium Nitride is a binary III/V direct bandgap semiconductor.
- It is very hard and mechanically stable.
- It is well-suited for high-power transistors capable of operating at high temperatures.
- **Uses** - Since the 1990s, it has been commonly used in Light Emitting Diodes (**LED**).
- Gallium nitride gives off a blue light used for disc-reading in **Blu-ray**.
- Additionally, gallium nitride is used in semiconductor power devices, RF components, lasers, and photonics.
- In the future, we will see GaN in sensor technology.
- **Advantages** - Reduced Weight, Reduced Size, Reduced Costs and Increased Energy Efficiency.

Reference

1. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1805535
2. https://gansystems.com/gallium-nitride-semiconductor/#:~:text=Gallium%20Nitride%20is%20a%20binary,%2Dreading%20in%20Blu%2Dray.

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