

Project Bandhan

❖ Context

- **Central Institute of Cotton Research (CICR)**, state agricultural universities and a private player have launched the **technology demonstration project** to tackle **Pink Bollworm (PBW)** infestations in cotton.

❖ About the Technology

- **Mating disruption** is an innovative pheromone-based technique that interferes with the reproductive cycle of PBW.
- The Central Insecticide Board and Registration Committee (CIBRC) had approved the technology in the **integrated pest management (IPM) strategies** for controlling PBW in India for the first time in 2019-20.
- As part of this, CICR and the other players have come out with **PBKnot**.
- It is a solid metric dispenser rope which can be easily tagged to the cotton plants.
- The PBKnot charges the surrounding air with **Gossyplure**, a pheromone scent that confuses the male adults.
- The scent prevents them from finding and mating with female adults and thus reduces the number of eggs laid and controls the PBW population.

❖ About Pink Bollworm



- PBW, *Pectinophora gossypiella*, has emerged as a key pest affecting cotton over almost **12 million hectares annually** in India.

- It has a **short life cycle** and can multiply 4-5 generations in a crop cycle, thus potentially threatening cotton from an early stage.
- Though **native to India**, it is **now distributed worldwide**.
- The current methods of controlling pink bollworms primarily rely on **chemical spraying** which are proving to be **non-effective**.
- The evolution of **resistance and pest adaptation to Bt crops containing Cry1Ac and Cry2Ab** has also been observed recently.

❖ About Indian Cotton Production

- India is the **largest producer** of cotton with **23% of the world's production in 2021-22 season**. Due to its economic importance, it is termed as "**White Gold**".
- Around **67%** of cotton is grown in **rain-fed areas**.
- In India, majority of the cotton production comes from ten major cotton growing states, which are grouped into **three diverse agro-ecological zones**, as under:-
 - **Northern Zone** - Punjab, Haryana and Rajasthan.
 - **Central Zone** - Gujarat, Maharashtra and Madhya Pradesh.
 - **Southern Zone** - Telangana, Andhra Pradesh, Karnataka and Tamil nadu.

PSLV Orbital Experimental Module or 'POEM

❖ Context

- Recently, The **Indian Space Research Organization** successfully launched **PSLV-C53** which placed three Singapore satellites in orbits.
- ISRO also achieved the feat of successfully launching the **PSLV Orbital Experimental Module or 'POEM'**.

❖ POEM

- It is a platform that **will help perform in-orbit experiments using the final, and otherwise discarded, stage of ISRO's workhorse rocket**, the Polar Satellite Launch Vehicle (PSLV).
- POEM is carrying **six payloads**, including two from Indian space start-ups Digantara and Dhruva Space.

❖ PSLV

- The PSLV is a **four-stage rocket**.
- The **first three spent stages fall back into the ocean**.
- The **final stage (PS4)** after launching the satellite into orbit **ends up as space junk**. In the PSLV-C53 mission, the spent final stage **will be utilized as a "stabilized platform" to perform experiments**.

❖ Keepin POEM 'Alive and Stable' in Orbit

- According to ISRO, **POEM has a dedicated Navigation Guidance and Control (NGC) system** for attitude stabilization. It stands for controlling the orientation of any aerospace vehicle within permitted limits.
- The **NGC will act as the platform's brain** to stabilize it with specified accuracy.

- POEM will **derive its power from solar panels** mounted around the PS4 tank, and a **Li-Ion battery**.
- It will navigate using **"four sun sensors, a magnetometer, gyros & NavIC"**.
- It carries **dedicated control thrusters** using Helium gas storage. It is enabled with a telecommand feature.

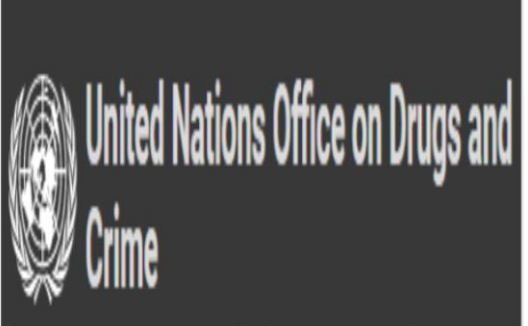
❖ Previous Attempt to Use PS4 Junk

- The Indian space agency first demonstrated the capability of using PS4 as an **orbital platform in 2019 with the PSLV-C44 mission**. It injected **Microsat-R** and **Kalamsat-V2 satellites** into their designated orbits.
- The fourth stage in that mission was kept **alive as an orbital platform for space-based experiments**.
- POEM' is a **technological upgrade** over what ISRO had initially attempted in 2019, during the launch of PSLV-C44 mission. A stabilized orbital platform is a **significant upgrade over an orbital platform:-**
 - Stabilization helps keep the payload in a correct position with respect to the Earth, sun etc.
 - This could offer several scientific advantages for the payloads that are being carried.

Face to Face Centres



World Drug Report 2022



- ❖ **Context**
 - The **United Nations Office on Drugs and Crime** released the report recently.
- ❖ **Key Highlights of the Report**
 - The **number of drug users increased 26 % globally** over the last decade to 284 million people (15-64 years).
 - Globally, 209 million people consumed cannabis, 61 million use opioids, 34 million use amphetamines, 21 million use cocaine and 20 million use ecstasy.
 - In **Africa and South and Central America**, most people were treated for **cannabis abuse** while **opium addiction** was rampant in **south-eastern Europe and central Asia**.
 - **India has the most number of opiate users in the world**.
 - It is likely to be more vulnerable in future due to intensification of trafficking in opiates originating in Afghanistan.

ABHYAS



- ❖ **Context**
 - **ABHYAS – High speed Expendable Aerial Target (HEAT)** was successfully flight-tested from the Integrated Test Range (ITR), Chandipur.
- ❖ **Key Highlights**
 - It is designed & developed by **Aeronautical Development Establishment of Defence Research and Development Organisation (DRDO)**.
 - The air vehicle was launched using twin under-slung boosters which provide the initial acceleration to the vehicle.
 - It is powered by a small **gas turbine engine** to sustain a long endurance flight at **high subsonic speed**.
 - It is used as an **aerial target for evaluation of missile systems** by armed forces.
 - The vehicle is programmed for **fully autonomous flight**.
 - During the test flight, the aircraft was examined for its manoeuvrability and performance at low altitudes.

Business Reform Action Plan (BRAP) 2020 report



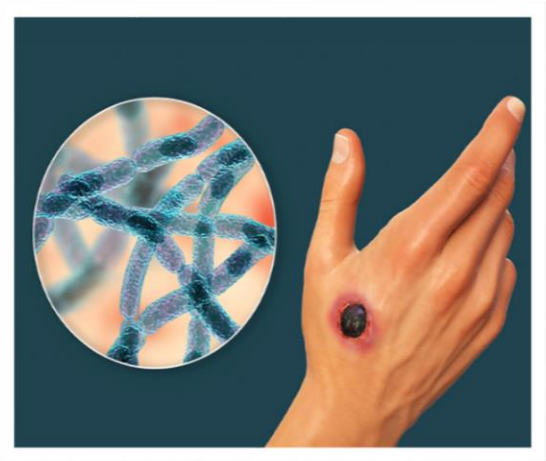
- ❖ **Context**
 - The centre released the report which ranked **States and Union Territories** on the basis of **ease-of-doing-business** parameters.
- ❖ **Key Highlights**
 - The feedback-based assessment was done by the **Department for Promotion of Industry and Internal Trade (DPIIT)**, covering 301 reform action points.
 - It is the fifth edition. The **first edition was released in 2014**.
 - **Top achievers:** scored more than 90 %: Andhra Pradesh, Gujarat, Haryana, Karnataka, Punjab, Tamil Nadu and Telangana have been adjudged the top achievers.
 - **Achievers:** scored between 80 % and 90 % : Himachal Pradesh, Madhya Pradesh, Maharashtra, Odisha, Uttarakhand and Uttar Pradesh.
 - **Aspires:** scored between 50 % and 80 %: Assam, Chhattisgarh, Goa, Jharkhand, Kerala, Rajasthan and West Bengal.
 - **Emerging Business Ecosystems:** scored less than 50 % : Delhi, Bihar, Andaman & Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Jammu and Kashmir, Manipur, Meghalaya, Nagaland, Puducherry, Tripura and all the other UTs.

Anthrax

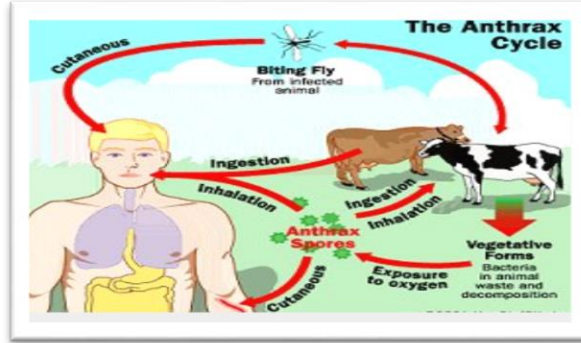
- ❖ **Context**
 - The outbreak of anthrax has been confirmed in Athirapally forest range in Thrissur, Kerala, after testing carcasses of wild boars.
- ❖ **Key Highlights**
 - Many wild boars died in the area in the past couple of days.
 - Anthrax is caused by a **spore-forming rod-shaped bacteria known as Bacillus anthracis**.

Face to Face Centres





- It occurs naturally in soil and commonly affects domestic and wild animals around the world.
- Animals become infected when they breathe in or ingest spores in contaminated soil, plants, or water.



The disease can catch humans through one of the following routes -

- Comes into contact with the domestic waste of the infected animals.
 - Eating undercooked meat from an infected animal.
 - Breathe in anthrax spores (the most deadly form of disease).
- A skin-related (**cutaneous**) anthrax infection enters the human body through skin, usually through a cut or other sore. It's the most common route of the disease and also the mildest form.
 - Common symptoms of the disease in humans are sores, fever, shortness of breath, nausea and heavy sweating.
 - **Antibiotics can cure the infection but it is fatal if untreated.**

India's External Debt



❖ Context

- Recently, Reserve Bank of India (RBI) data showed that **India's external debt rose to \$620.7 billion at end-March 2022.**
- It records an **increase of \$47.1 billion** over the year earlier period.

❖ Key Highlights

- The external debt to **GDP ratio declined to 19.9% at end-March 2022**, from 21.2% a year earlier.
- India's **long-term debt** (with original maturity of above one year) rose to \$499.1 billion (5.6% increment), recording an **increase of \$26.5 billion** over its level at end-March 2021.
- During the same period, the share of **short-term debt** in total external debt **increased to 19.6%** (Increased to \$121 billion) from 17.6%.
- Similarly, the **ratio of short-term debt to foreign exchange reserves increased to 20%.**
- **U.S. dollar-denominated debt remained the largest component** of external debt, with a share of 53.2%.
- **Net claims of non-residents on India increased by \$5.6 billion** during the fourth quarter of 2021-22 to \$359.8 billion in March 2022.

❖ About External Debt

- External debt is defined as **part of a country's debt that is borrowed from various foreign lenders** such as commercial banks, governments, or international financial institutions.
- External Debt is borrowed from foreign lenders and is **mostly paid in the currency in which the loan was made.**
- In case of non-payment of external debt, a country could get embroiled in a debt crisis.

Partnership Agreement between the MNRE and IRENA

❖ Context

- Recently, Cabinet approves **Strategic Partnership Agreement** between the **Ministry of New and Renewable Energy (MNRE), India and the International Renewable Energy Agency (IRENA).**

❖ Key Highlights

- The Agreement was **signed in January 2022.**
- **Aim:** To drive ambition, leadership and knowledge on green energy transitions based on renewable energy in India.
- **Significance:** The Agreement will **help India's energy transition efforts** and will also help the world in **combating climate change.**





- The areas of cooperation as envisaged in the Strategic Partnership Agreement will **support India in achieving its ambitious target of 500 GW of installed non-fossil fuel electricity capacity by 2030.**
- This in-turn will **promote Atmanirbhar Bharat.**

❖ **About International Renewable Energy Agency (IRENA)**

- It is an **intergovernmental organization** mandated to facilitate cooperation, advance knowledge, and promote the adoption and sustainable use of renewable energy.
- It was **founded in 2009** and its statute entered into force on 8 July 2010.
- **Headquartered** in Masdar City, Abu Dhabi.
- IRENA is an official **United Nations observer.**
- **165 states** and the European Union are members of IRENA.

RIMPAC Exercise



❖ **Context**

- Indian multi-role stealth frigate **INS Satpura** and a **P-8I long-range maritime patrol aircraft** have reached **Pearl Harbour in Hawaii** to take part in the **Rim of the Pacific (RIMPAC) exercise.**
- **RIMPAC exercise** is the **world's largest naval wargames** including the four 'Quad' countries and the nations around the **South China Sea.**

❖ **Key Highlights**

- **Aim:** The exercise spanning over six weeks of intense operations and training is aimed at enhancing interoperability and building trust among the navies of friendly foreign countries.
- **Led by the US Navy, 27 countries** are participating in the current edition of the **multi-dimensional exercise** with an eye firmly on China and ensuring **"a free and open Indo-Pacific"**.
- **India first participated in RIMPAC in 2014** when indigenously built **Shivalik class** stealth frigate **INS Sahyadri** took part in the exercise.
- **Before 2014,** the Indian Navy's presence in the wargames was only as an observer for the 2006, 2010 and 2012 editions.
- **INS Satpura:** It is an indigenously designed and built 6000-tonne guided missile stealth frigate, equipped to seek and destroy adversaries in air, surface and underwater.
- India conducts the top-notch **annual Malabar exercise** with the other **three Quad countries, the US, Japan and Australia,** apart from **several bilateral and trilateral exercises.**

Bacterial Cement Mortar Brick



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❖ **Context**

- Recently, a faculty member of **National Institute of Technology Karnataka (NITK), Surathkal** has received an **Indian Patent for producing cement mortar brick** with inclusion of **bacteria in combination.**

❖ **Key Highlights:**

- It is claimed to be **superior than the conventional bricks** in terms of strength, life of structure and to possess a **'self-healing'** property.
- This action is done by the **precipitation of lime (calcium carbonate)** by the **non-pathogenic bacteria** used in the composite, upon coming into contact with air and water through the crack.
- The precipitated lime will cover the crack, thereby improving the stability of the surface.
- The non-pathogenic **bacteria of genus Enterobacter, Enterococcus and Serratia** and its growth solution are the part of this invented composite along with **sand and cement.**
- **Significance:** This invention is not limited to this specific system but using the same technique, development of **bio cement and bio concrete is feasible.**

