

1. Keonjhar Kalachampa: Odisha farmer Jayant Kumar Jena seeks profit share from commercialisation of Keonjhar Kalachampa paddy. If accepted, it will be first benefit-sharing case in Odisha under Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA).

- **About:** Keonjhar Kalachampa, known for its tolerance to major diseases and pests under field conditions in coastal Odisha.
 - It is non-lodging (resistant to bending or falling over), responsive to fertilizers, suitable for both timely and late sowing.
 - **Yield:** Gives 7,000 kg/hectare average yield.
 - Accepted widely by farmers due to biotic stress resistance.
- **Evolution and Preservation:** Discovered in 2006–07 during seed germplasm survey by Odisha Agri Dept.
 - **Catalogued:** Among 1,070 paddy and 200 non-paddy varieties.
 - **Preservation:** Stored in **state gene bank** (climate-controlled, up to 50 years).
 - **Registration Process:** Based on **DUS testing**, 62 traits listed, seeds submitted.
- **About Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA):**
 - Promote **nAuthority:** Quasi-judicial body under Central Govt.
 - **Mandate:** Protects plant varieties, farmers' rights, and breeders' rights.
 - **Aim:** ew variety development and recognise farmer conservation efforts.



2. Kuno National Park: Recently, Two cheetahs shifted from Madhya Pradesh's Kuno National Park to the Gandhi Sagar Wildlife Sanctuary.

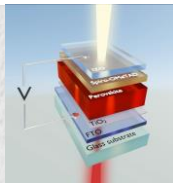
- **About Kuno National Park:** Situated in the Morena and Sheopur districts of Madhya Pradesh.
 - **Topography:** Nestled near the Vindhyan Hills.
 - **Area:** Spans a total of 750 sq.km.
 - **Name Origin:** Derived from the Kuno River, a tributary of the Chambal River.
 - **History:** Initially a wildlife sanctuary; upgraded to national park status in 2018.



- **Project Selection:** Chosen under the 'Action Plan for Introduction of Cheetah in India'.
- **Vegetation:**
 - **Landscape:** Primarily a grassland region, interspersed with rocky outcrops.
- **Flora:** Dominated by Kardhai, Salai, and Khair trees.
 - **Forest Type:** Mostly mixed forest.
- **Fauna:** Inhabited by jungle cat, Indian leopard, sloth bear, Indian wolf, striped hyena, golden jackal, Bengal fox, and dhole.
 - **Avifauna:** Hosts more than 120 bird species.
- 3. **Enzymes/Coenzymes:** A recent published paper by Chinese Academy of Sciences titled 'Gene-edited plants make the jump from farm to factory', highlighted a breakthrough in Enzymes or Coenzymes (CoQ10) Bio-fortification in rice.
 - **About:** Enzymes are proteins that catalyse reactions in a cell, making metabolism efficient.
 - Cofactors are molecules required by many enzymes for efficient functioning.
 - Coenzymes are naturally occurring organic molecules that bind to and support the activity of enzymes.
 - Coenzyme Q (ubiquinone) is a molecule with several isoprene units that act as antioxidants and provide stability against stress.
 - Ubiquinone is present in every cell membrane and is crucial for energy production.
 - CoQ exists in 10 types (CoQ1 to CoQ10), each being a lipid-soluble, and water-insoluble antioxidant molecule in the respiratory chain.
 - Coenzymes play a vital role in the mitochondrial function, the major energy producer in the cell.
 - **About CoQ9 in Plants:** Has nine isoprene units, is produced by most cereal crops.
 - Rich in wheat, rice, oats, barley, corn, rye, and millet.
 - Also found in bamboo, barley, and flowering plants such as cinnamon, avocado, and pepper.
 - **Importance of CoQ10 in Humans:** It is a part of the mitochondrial electron transport chain, generating most of the body's cellular energy.
 - Organs such as the heart, with high energy demands, contain high concentrations of CoQ10.
 - CoQ9 is rich in daily foods like rice, wheat, and maize.
 - Humans need more CoQ10 due to genetic factors, ageing, and neurological problems.

- 4. Anti-Satellite (ASAT) weapon testing/Rendezvous and Proximity Operations (RPO):** European Union Special Envoy for Space recently highlighted the threats from Anti-Satellite (ASAT) weapon testing, Rendezvous and Proximity Operations (RPOs), and cyber jamming/spoofing in space. It also highlighted India's role in developing a global framework for responsible behaviour in space.
- **About Anti-Satellite (ASAT) Weapon Testing:** Debris from ASAT tests poses a major threat to satellites. EU supports a UN ban on destructive ASAT testing.
 - India's ASAT test (March 2019) destroyed a satellite in Low Earth Orbit (~300 km) using a three-stage interceptor.
 - Several countries have tested ASATs, increasing space debris. No specific EU-India talks on ASAT yet; focus remains on cooperation.
 - **About Rendezvous and Proximity Operations (RPO):** It involves a spacecraft manoeuvring close to another space object.
 - RPOs not inherently problematic, but need regulation.
 - India-EU space dialogue planned to frame norms for responsible RPOs.
 - Unnotified RPOs by hostile actors near sensitive satellites are a security threat.
 - Aim to set international agreements on acceptable space behaviours.
 - **Other Key Points:** Cyber jamming and spoofing are threats to space-based services. Space debris causes safety challenges and risk of accidents.
 - Proposed India-EU space dialogue to address regulatory gaps and boost business environment. Upcoming EU Space Act to promote EU coordination, ensure safety and sustainability.
- 5. Carbon-Based Perovskite Solar Cells (CPSCs):** Scientists have recently developed ethanol and ethyl acetate-based solutions to dissolve other components of perovskite solar cells.
- This method allows for recycling and reuse of all components, including perovskite crystals.
 - **About Carbon-Based Perovskite Solar Cells (CPSCs):** First indigenous perovskite-powered niche product developed in India.
 - Aims to enable stable and futuristic perovskite solar cells.
 - **Issues with Perovskite Photovoltaic Cells:** Degrade on exposure to heat, moisture, light, and other environmental factors.

- Stability over long durations is a key challenge for commercial-scale deployment.
 - CPSCs help reduce stability issues and fabrication costs.
 - Humidity and thermal stress sensitivity of perovskite materials remain major barriers.
 - **Significance:** Indigenously developed CPSCs may resolve stability concerns in PSCs.
 - Can reduce fabrication costs and accelerate commercialization of perovskite-based niche products.
 - **About Perovskite:** A material with the same crystal structure as calcium titanium oxide (CaTiO_3). Discovered in 1839 in the Ural Mountains, named after Lev Perovski.
 - General formula: ABX_3 , where A and B are cations, X is an anion.
 - Compositional flexibility allows wide-ranging electrical, optical, and physical properties—from insulating to superconducting.
- 6. Exercise Desert Flag-10:** Recently, Indian Air Force (IAF) contingent reached Al Dhafra Air Base in the United Arab Emirates to participate in Exercise Desert Flag-10.
- **About:** Exercise Desert Flag-10 is a premier multinational air combat exercise hosted by the UAE Air Force.
 - **Dates:** Scheduled from 21 April to 08 May 2025.
 - **Host:** Held in the United Arab Emirates (UAE).
 - **Indian Participation:** IAF is fielding MiG-29 and Jaguar aircraft.
 - **Other Participating Nations:** Australia, Bahrain, France, Germany, Qatar, Saudi Arabia, Republic of Korea, Turkey, UAE, United Kingdom, United States
 - **Aim:** To conduct complex and diverse fighter engagements.
 - **Focus Areas:** Exchange of operational knowledge and best practices
 - Enhancing mutual understanding and interoperability
 - Strengthening military cooperation among participant nations
 - **Significance for India:** Reflects India's commitment to regional and global defence ties
 - Promotes interoperability with friendly foreign air forces



7. **Yellow Sea:** After aggressive posturing in the South China Sea, China is upping the ante in the Yellow Sea, following the building of a gigantic steel rig.

- **About Yellow Sea:** Known as Huang Hai in China and the West Sea in North & South Korea.
- **Location:** A marginal sea of the Western Pacific Ocean, lies north of the East China Sea.
- Bordered by mainland China (north & west) and North & South Korea (east).
- **Name Origin:** Named after yellowish sand particles from the Gobi Desert that color the sea surface golden yellow.
- **Area:** Covers approximately 400,000 sq. km.
- **Dimensions:** Extends about 960 km north–south, and around 700 km east–west.
- **Depth:** Relatively shallow, with an average depth of 55 to 120 meters (180 to 394 feet).
- One of the world's largest continental shelf areas submerged in water.
- **Climate:** Cold, dry winters, Wet, warm summers.
- **Major Rivers Flowing Into It:** Han, Yangtze, Datung, Yalu, Guang, and Sheyang Rivers.
- **Islands:** Numerous islands, including Jeju Island (South Korea), Shandong Peninsula islands (China), Ganghwa Island (South Korea)
- **Leading Port Cities:** Qingdao and Dalian (China), Inch'ŏn (South Korea), and Namp'o (North Korea)



8. **Sapsan (Hrim-2/Grom-2) Missile System:** Recently acknowledged by Russia's Ministry of Defence as a growing threat amid its use in the conflict.

- **About:** Sapsan Missile System developed by Ukraine as a tactical ballistic missile system.
- **Design Purpose:** Combines features of a tactical missile system and a multiple rocket launcher.
- **Range:** Can strike targets between 50 to 280 km, range extended up to 700 km, beyond the earlier known 450–500 km.
- **Launcher:** Mounted on a 10-wheeled Transporter-Erector-Launcher (TEL), carries two containerized missiles simultaneously.
- **Capabilities:** Aero-ballistic flight path allows it to evade modern air defense systems like S-300 and S-400, can launch both ballistic and cruise missiles.