

### CORAL BLEACHING

Scientists working on Australia's Great Barrier Reef have successfully trialled a new method for freezing and storing coral larvae they say could eventually help rewild reefs threatened by climate change. The Great Barrier Reef has suffered four bleaching events in the last seven years, including the first ever bleach during a La Nina phenomenon, which typically brings cooler temperatures.



#### What are Coral reefs?

- Corals are marine invertebrates or animals not possessing a spine.
- Each coral is called a polyp and thousands of such polyps live together to form a colony, which grows when polyps multiply to make copies of themselves.
- Corals share a symbiotic relationship with single-celled algae called zooxanthellae.
- The algae provides the coral with food and nutrients, which they make through photosynthesis, using the sun's light.
- In turn, the corals give the algae a home and key nutrients. The zooxanthellae also give corals their bright colour.
- Australia's Great Barrier Reef is the world's largest reef system stretching across 2,300 km.
  - It hosts 400 different types of coral, gives shelter to 1,500 species of fish and 4,000 types of mollusc.

#### Coral Bleaching:

- Coral Bleaching happens when corals experience stress in their environment due to changes in temperature, pollution or high levels of ocean acidity.
- Under stressed conditions, the zooxanthellae or food-producing algae living inside coral polyps start producing reactive oxygen species, which are not beneficial to the corals.
- So, the corals expel the colour-giving zooxanthellae from their polyps, which exposes their pale white exoskeleton, giving the corals a bleached appearance.

- This also ends the symbiotic relationship that helps the corals to survive and grow.

## What Causes Coral Bleaching?

- **Change in Ocean Temperature:** Increased Ocean temperature caused by climate change is the leading cause of coral bleaching.
- **Runoff and Pollution:** Storm generated precipitation can rapidly dilute ocean water and runoff can carry pollutants, which can bleach near shore corals.
- **Overexposure to sunlight:** When temperatures are high, high solar irradiance contributes to bleaching in shallow water corals.
- **Extremely low tides:** Exposure to the air during extremely low tides can cause bleaching in shallow corals.

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## RIGHT TO REPAIR PORTAL

Recently, the Union Minister of Consumer Affairs, Food & Public Distribution unveiled the Right to repair portal.



### About Right to Repair Portal:

- On this portal **manufacturer will share the manual of product** details with customers so that they can either repair it by themselves, or by third parties, rather than depend on the original manufacturers.
- Initially, **mobile phones, electronics, consumer durables, automobiles and farming equipment** will be covered.
- It allows consumers to repair and modify their consumer products against the manufacturer requiring them to use their services either by restricting access to tools and components or putting in place software barriers.
- From now on India will be joining a clutch of **countries like the US and the UK** that offer this facility.

- It will save consumers money and contribute to circular economy objectives by improving the life span, maintenance, re-use, upgrade, recyclability, and waste handling of appliances.
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## ORGANIC SOLAR CELLS

Recently, researchers at IIT Kanpur have developed organic solar cells under the DST-RCUK APEX project.



### What is Organic Solar Cells?

- An organic solar cell consisting of a combination of an **organic polymer and PCBM (an organic semiconductor)** developed on steel substrates can potentially convert a steel roof into an energy-producing device.

### Features:

- The devices consist of a blend of organic polymer PTB7 as a donor and PCBM as an acceptor.
- The devices were fabricated on opaque steel substrates with a **MoO<sub>3</sub>/Au/MoO<sub>3</sub> top electrode**. These electrodes offer higher optical transmission as compared to only metallic electrodes.
- The devices with multilayer electrodes showed a clear improvement in the photovoltaic performance by 1.5 times, as compared with those obtained with single-layer top metal electrodes of gold.

### What is the DST-RCUK APEX project?

- It is a jointly developed programme of the **Department of Science and Technology (Under the ministry of Science and Technology)** and the Research Councils United Kingdom (RCUK) focussing on reducing energy demand in the built environment.
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## PURSE SEINE FISHING

Recently, certain Indian coastal states have imposed a ban on purse seine fishing method.



## What is Purse Seine Fishing?

- A purse seine is made of a long wall of netting framed with floating and leadline (usually, of equal or longer length than the former) and having purse rings hanging from the lower edge of the gear, through which runs a purse line made from steel wire or rope which allow the pursing of the net.
- **Why it is banned?**
  - Because this fishing method uses a wide net to draw in not only the targeted fish but also at-risk varieties, including turtles.
  - The ban on purse seine fishing is implemented in the territorial waters of Tamil Nadu Kerala, Puducherry, Odisha, Dadra and Nagar Haveli and Daman and Diu, and the Andaman and Nicobar Islands up to 12 nautical miles.
- **Fishing is a State subject** and the management plan for marine fisheries in territorial waters is the job of the states (Under the Seventh Scheduled of the Indian constitution).

## Advantages of this method

- Purse-seine fishing in open water is generally considered to be an efficient form of fishing.
- It has no contact with the seabed and can have low levels of by catch.
- It can also be used to catch fish congregating around fish aggregating devices
- It is used in the open ocean to target dense schools of single-species pelagic (midwater) fish like tuna and mackerel.

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## ONE-RANK-ONE-PENSION SCHEME

### Why in News?

- The Union Cabinet recently approved pension revision for pensioners from the armed forces and their families under the One Rank One Pension (OROP) scheme with effect from July 2019.

### What is One Rank One Pension Scheme?

- In simple terms, OROP implies that uniform pension be paid to the Armed Forces personnel retiring in the same rank with the same length of service, regardless of their date of retirement.
- Earlier, ex-servicemen used to get pensions as per the Pay Commission's recommendations of the time when they had retired.
  - A Pay Commission examines and reviews the existing pay structure & recommends changes in the salary, allowances, and other facilities for civil employees as well as for the armed forces.
- Under OROP, future enhancements in the rates of pension would be automatically passed on to the past pensioners.
  - This implies bridging the gap between the rate of pension of current and past pensioners at periodic intervals i.e. every 5 years.
- Ex-servicemen drawing pensions will benefit from the OROP scheme, especially those who retired before **2006**.
  - Because at present, pensioners who retired before 2006 draw less pension than their counterparts and even their juniors.
- The scheme covers all three services — **Air Force, Navy and Army**.

### **How much does Ministry of Defence spend on Pensions?**

- During the OROP protests of 2013-15, it was argued repeatedly that meeting the demand would be financially unsustainable.
- Because soldiers retire early and remain eligible for pension for much longer than other employees. Soldiers usually retire at age 35.
- Currently, the approximate Defence pensioners are 33 lakhs.
  - The actual expenditure of the Defence Ministry on pensions was Rs 1.18 lakh crore in 2019-2020, Rs 1.28 lakh crore in 2020-2021.
- The Defence Ministry's pension-to-budget ratio is the highest among all ministries, and **pensions are more than one-fifth of the total defence budget**.

### **News Summary:**



- The Union Cabinet recently approved a pending pension revision for pensioners from the armed forces and their families under the One Rank One Pension (OROP) scheme, which has been delayed since July 2019.
- With this, more than 25.13 lakh people, including over 4.52 lakh new beneficiaries, armed forces pensioners and family pensioners will benefit.
- The Supreme Court had earlier this year directed the government to quickly carry out the OROP re-fixation exercise upon the expiry of the five-year time-frame in July 2019, as was promised when the scheme was implemented with effect from July 2014.

### Annual Expenditure:

- The estimated annual expenditure for the implementation of the revision has been calculated as approximately Rs. 8,450 crore based on 31% Dearness Relief (DR).
- Arrears from July 1, 2019 to December 31, 2021 have been calculated as over Rs. 19,316 crore based on DR at 17% for the period from July 1, 2019 to June 30, 2021 and at 31% for the period from July 1, 2021 to December, 2022.

### PATRIOT SYSTEM

U.S.A recently announced that it would send its most advanced ground-based defence battery (Patriot system ) to Kyiv.



#### About Patriot system:

- The Patriot is one of the most sought-after defence systems and has been deployed in **18 countries, including the U.S.**
- **History:**
  - Initially developed as a system to intercept high-flying aircraft by **Raytheon Technologies, the Patriot was modified in the 1980s** to focus on other threats such as ballistic missiles.
  - The programme's roots can be traced back to the 1960s when the Pentagon was looking to replace the **HAWK and Nike-Hercules air defence systems.**
  - Currently, Patriot batteries can defend against ballistic missiles, cruise missiles, drones, jets and “other threats”, but it doesn't offer protection against low-flying small drones.

- A mobile Patriot system includes a control centre, a radar station to detect threats, missile launchers to take out those threats and other support vehicles.
  - **It can launch different types of interceptor missiles:** The older PAC-1 and PAC-2 interceptors used a blast-fragmentation warhead, while the newer PAC-3 missile has a more advanced hit-to-kill technology.
  - The Patriot system's radar has a range of over **150 km** and it can track over **50 potential targets at the same time.**
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## CHRISTMAS

Christmas, marking the birth of Jesus Christ, was celebrated across the country and around the world on December 25.



### About Christmas:

- **Christmas** is an annual festival, commemorating the birth of Jesus Christ, observed primarily on December 25 in the Gregorian calendar around the world.
  - It is believed that Joseph and Mary gave birth to Jesus Christ, considered to be the son of God, on **December 25 in Bethlehem.**
  - **Jesus of Nazareth** was a spiritual leader whose teachings formed the foundation of Christianity.
  - Although the Bible does not mention a specific date for his birth, **Emperor Constantine — the first Christian Roman emperor** — designated December 25 as Christmas, which became a day to commemorate Christ's birth.
  - The **United States declared December 25 as a federal holiday in 1870** and it has been a widely-recognised holiday around the world ever since.
  - **Celebrations:** Christians, especially Catholics, arrive at churches for Midnight mass, which is followed by greeting friends and family. The places of worship are decorated with Poinsettia flowers and candles for the Christmas Eve Midnight Mass service.
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## AVIAN FLU

As many as 7,000 birds are being culled in Kerala's Kottayam district following an outbreak of bird flu that has now spread to more parts of the district.



### What is Avian influenza?

- Avian influenza or bird flu is a highly contagious viral disease caused by Influenza Type A viruses which generally affects poultry birds such as chickens and turkeys.

- There are many strains of the virus – some of them are mild and may merely cause a low egg production or other mild symptoms among chickens, while others are severe and lethal.
- Wild aquatic birds such as ducks and geese are the natural reservoir of Influenza A viruses and the central players in the ecology of these viruses.

### History of bird flu among humans:

- It was in 1997 when humans are first known to have contracted bird flu following an outbreak in a live bird market of Hong Kong. It was the H5N1 strain of the virus.
- Subsequently, several other strains of the virus such as H5N2 and H9N2 spread from animals to humans, thus becoming a global public health concern.

### Does it spread easily to humans?

- No, it does not. Generally, people coming in close contact with infected alive or dead birds have contracted the H5N1 bird flu, and it does not usually spread from person to person.
- There is also no evidence, that the disease can be spread to people through properly prepared and cooked poultry food.
- The virus is sensitive to heat, and dies in cooking temperatures.

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## DOPING IN INDIA (GYMNAST DIPA SERVING 2-YEAR BAN FOR ANTI-DOPING VIOLATION)



## Why in news?

- As per one of the India's leading newspaper report, Indian gymnastics' poster girl Dipa Karmakar is under suspension since the second half of 2021 for her failure to honour the whereabouts as mandated by the world anti-doping agency (WADA).
- Dipa had changed the face of gymnastics in India after her ground-breaking fourth-place finish in the women's vault final at the Rio Olympics 2016
- According to this report, she is currently serving a two-year ban for this violation.

## World Anti-Doping Agency (WADA)

- WADA was established in 1999 as an international independent agency to lead a collaborative worldwide movement for doping-free sport.
- It was promoted by the International Olympic Committee.
- Its primary role is to develop, harmonize and coordinate anti-doping rules and policies across all sports and countries.
- Its key activities include:
  - scientific and social science research;
  - education; intelligence & investigations;
  - development of anti-doping capacity; and
  - monitoring of compliance with the World Anti-Doping Program.

## What is whereabouts clause as mandated by WADA?

- Some athletes, usually those who are part of a Registered Testing Pool (RTP), are required to provide whereabouts information.
- This information is used by Anti-Doping Organizations (such as NADA, WADA etc.) to locate athletes for effective out of competition doping control.
- If an athlete in the RTP commits three whereabouts failures (which can be a combination of filing failure and/ or missed tests) in a 12-month period, it will constitute an anti-doping rule violation.

- In this case, he/she will be sanctioned for a period of ineligibility of 12 to 24 months (first offence) or more for subsequent offences.

## **Doping in India**

### **What is doping?**

- Doping refers to the use of banned substances in competitive sports with a primary goal to enhance performance.
  - Performance enhancing drugs (PEDs) is another term for drugs used by athletes to improve their athletic performance.
- This can be achieved in broadly four ways – by increasing muscle mass, getting an artificial spike in energy ahead of an event, cutting down on recovery time and masking the effect of other drugs.

### **Doping in India: Where does India Stand?**

- In 2022, 62 Indian athletes have been caught doping or in possession of banned substances, according to the Athletics Integrity Unit (AIU) of World Athletics.
  - Only Russia has recorded more doping violations than India with 87 athletes receiving punishment.
- Ahead of the 2022 Commonwealth Games, five members of the Indian athletic contingent had failed their dope tests.
- As many as 152 doping violations were reported in the nation in 2019 – only behind Russia (167) and Italy (157).

### **Why do so many Indian athletes dope?**

- A major reason is the athlete wanting to register a big performance on the basis of which they can get jobs or incentives.
- The increasing number of privately sponsored, prize-money marathons & cross country runs in India also are a source of doping temptation for athletes.
  - There is rarely any stringent dope testing at private competitions, giving athletes a free run.
- Corrupt coaches are also one of the reasons.

- The Maharashtra Athletics Association recently banned coach Mickey Menezes after it was proved that he was responsible for giving an athlete injections that contained a banned substance.

## **What are the existing regulatory frameworks in India?**

### **• Legislation**

- In August 2022, Parliament passed the **National Anti-Doping Bill, 2022**.
- The legislation seeks to prohibit athletes, support personnel and other people from engaging in doping in sport.
- The bill aims at strengthening anti-doping activities in sports and offer a statutory framework for the functioning of the National Anti-Doping Agency (NADA).

### **• Institution: National Anti-Doping Agency (NADA)**

- NADA was set up as registered society in November 2005 with a mandate for Dope free sports in India.
  - It has now been made a statutory body under National Anti-Doping Act, 2022.
- NADA holds regular testing in two different ways.
  - The first one is called the in-competition testing, wherein athletes are tested for banned substances during a competition.
  - To prevent the practice of doping during an off-season, NADA also organises out-of-competition testing.

### **Conclusion**

- India needs to work on a two-pronged strategy of testing as many athletes as it can and educating athletes.
- Also, it should focus on launching and interactive awareness campaign and an integrity campaign to make athletes feel responsible.