

- **Draft amendment was notified** by Food Safety and Standards Authority of India (FSSAI) under **Food Safety and Standards Act 2006**.
- Now **provisions of draft related to limits of micronutrients** in vitamin and mineral premix for **manufacturing of fortified rice kernels (FRKs)** have been operationalised (refer to the table).
- ⊖ This will **strengthen the national fortification programme**.

- **Fortification** is addition of **key vitamins and minerals** to staple foods such as rice, wheat, oil, milk and salt to **improve their nutritional content**.

- ⊖ **Rice fortification** refers to **adding FRK-containing FSSAI-prescribed micronutrients** (Iron, Folic Acid, Vitamin B12) to **normal Rice** (Custom Milled Rice) in the ratio of **1:100**.
- ⊖ **coating, extrusion and dusting** are **key technologies** for rice fortification.
- ⊖ **In India, extrusion technology** is employed, where **milled rice is pulverized** and mixed with a **premix containing vitamins and minerals**.



- **Benefits:** Fortification is a cost-effective method for **combating malnutrition**.

- **Key initiatives**

- ⊖ **Distribution of fortified rice under**
  - ◆ **Saksham Anganwadi and Poshan 2.0**
  - ◆ **Centrally sponsored pilot scheme** on “Fortification of Rice & its Distribution under Public Distribution System.
- ⊖ ‘+F’ logo by the FSSAI to **identify fortified foods**.

- **Key issues:** Fortified rice could be **harmful to people suffering from thalassemia and sickle cell anaemia**.

Micronutrient	Composition (per 100g of Vitamin and mineral premix)
Iron	8-20g/100g
Vitamin B9 (folic acid)	45-55mg/100g
Vitamin B12 (Cynocobalamine)	0.45-0.55mg/100g

## India-bound cargo ship hijacked by Houthi rebels in Red Sea

- **Saudi-led coalition** (an alliance of nine countries from West Asia and North Africa, led by Saudi Arabia ) termed this as **an act of armed group of “piracy”**

- The ship called **Galaxy Leader** is **British-owned** and **Japanese-operated** and was heading from **Turkey** towards **Pipavav in Gujarat**.

- ⊖ The hijacking occurred approx. **150 km off the coast of Yemen’s port city of Hodeida**, near the coast of Eritrea.

- **Red Sea** is, a **narrow strip of water** extending southeastward from the **Suez Canal** to the **Bab el-Mandeb Strait**, which connects with the **Gulf of Aden** and then with the **Arabian Sea**.

- **Importance of Red Sea trade Route:**

- ⊖ It is a **crucial route for international trade and energy shipments**, around **93-100%**, of Arab countries’ total exports pass through it.
- ⊖ Approx. **10%** of seaborne cargo sails through the **Red Sea** including most of the **Asian trade with Europe**.
- ⊖ Both the **US and China** have Naval bases in Djibouti which points towards the **geostrategic importance** of this region.

- **Challenges of Piracy**

- ⊖ Piracy can **deter trade** along key global shipping chokepoints and **disrupt critical supply chains**.
- ⊖ Strong nexus with **local mafia groups, illegal trafficking, or even terrorism**.
- ⊖ **Higher costs** arise as ships divert around piracy areas, requiring extra fuel, and **increased shipping insurance premiums**, etc.
- ⊖ Poses a **significant risk** to **sailors, the shipping industry**, and the coastal states that border the piracy-prone zone.

### About Houthi rebels

- **Houthis are a rebel group** locked in a civil war with the Yemeni government for almost a decade.
- ⊖ They are named after the **Houthi tribe**.
- They have been in power in northern Yemen, including the official capital Sanaa,
- Houthis, reported to be backed by Iran, also support **Hamas and Hezbollah**, involved in cross-border conflicts with Israel



## Station (ISS)

➤ AWE is a pioneering NASA experiment designed to explore the interplay between terrestrial and space weather.

➤ It will examine airglow (colourful bands of light in Earth's atmosphere) to determine what combination of forces drives space weather in the upper atmosphere.

➤ It will also measure Atmospheric Gravity Waves (AGWs) at mesopause (an atmospheric layer that begins some 87 km in altitude).

⊖ AGWs form as buoyancy lifts air upward, and gravity brings it back down.

◆ The upward movement encourages cloud formation, while the downward movement promotes clear skies.

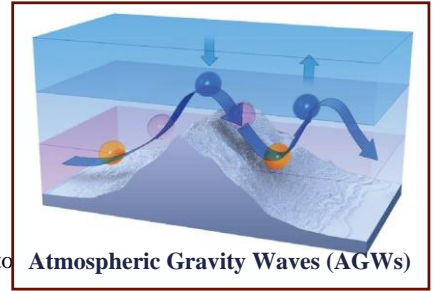
⊖ These waves result from various processes like airflow over mountains, convection (e.g., thunderstorms), and frontal systems.

⊖ They serve to connect different parts of the atmosphere, such as a surface storm causing changes in the ionosphere.

➤ Space Weather describes the variations in the space environment between the sun and Earth.

⊖ Sun is the primary source of space weather with the greatest disturbances usually caused by solar flares and subsequent geomagnetic storms.

⊖ Space weather can affect power grids, radio or satellite-based communication, operations of navigation (GPS).



**Significance of studying AGWs:** A better understanding of how gravity waves in the upper atmosphere interact with the jet stream, polar vortex and other phenomena could be key to improved weather predictions and climate models.

## China Sets Up Near-Space Command for Hypersonic Weapons Force

Near space is a region above and adjacent to the national airspace, it extends from 18 km above sea level up to 160 km above sea level.

⊖ The recent establishment of Near-Space Command and the incident of U.S. shooting down Chinese spy balloon earlier this year underscore growing belief that space may be next battleground.

➤ At present, Near Space region is a “no man’s land.”

➤ In this region air is too thin to support flight by most operational military aircraft, and yet gravity is too strong for a satellite to sustain itself in orbit.

⊖ Hence, very few aircraft fly there.

➤ Significance of Near Space:

⊖ Systems in this region can operate for weeks or months as opposed to Unmanned Air Vehicles, whose missions last 24-40 hours.

⊖ Satellites in this region are less costly than those in geostationary orbits.

⊖ System in Near Space could function as a surrogate satellite, offering advantages of:

◆ shorter transmission distances, better communications, reconnaissance, and surveillance.

⊖ Deployed equipment has small radar and thermal cross-sections making them relatively invulnerable to most traditional tracking and targeting methods.

➤ Limitations:

⊖ Controlling and maintaining near-space equipment is challenging due to the turbulent lower atmosphere.

⊖ Militarisation of this region poses significant diplomatic challenges.

➤ Hypersonic weapons fly at speeds of at least Mach 5 and are highly maneuverable and able to change course during flight.

## International Cricket Council (ICC) bans transgender players from international women's cricket

➤ The ICC has barred cricketers who experienced male puberty from international women's games, regardless of surgery or gender reassignment treatment.

⊖ ICC is the global governing body for cricket, headquartered in Dubai, UAE.

➤ Gender reassignment surgery, sometimes called sex reassignment surgery, is performed to transition individuals with gender dysphoria to their desired gender.

➤ ICC's new policy is based on the following principles (in order of priority) i.e.,

⊖ protection of the integrity of the women's game, safety, fairness, and inclusion.

➤ Debate around allowing transgenders in sports:

⊖ It centers around the balance of inclusion, sporting fairness, and safety in women's sports.

⊖ Physiological differences established during puberty can create significant performance advantages.

➤ Rules governing transgender persons in sports vary by organization, For example;

⊖ As per World Athletics (WA), Differences in sex development (DSD) athletes must keep their Testosterone below 2.5 nmol/L for 24 months to participate in the female category across events.

◆ DSD is a condition when an individual's physical sex traits don't match typical male or female development.

◆ Testosterone boosts athletic performance by increasing muscle mass, strength, and hemoglobin levels.

⊖ World governing bodies for cycling (UCI) and swimming (FINA) and World Rugby barred trans women from competing in women's events.

⊖ International Olympic Committee, placing responsibility on individual federations to determine eligibility criteria in their sport for transgender people.

- The meeting was co-chaired by **India's Defence Minister & External Affairs Minister** along with their **Australian counterparts**.
- Meeting highlighted the significance of a **strong India-Australia defence partnership for Indo-Pacific** and called for enhancing collaboration in **information exchange, defence research, etc.**
- **Strategic Convergence between India-Australia**
  - ⊕ Both democracies of Indo-Pacific have **pluralistic societies and market economies**.
  - ⊕ Hold a shared vision for Indo-Pacific that calls for a **free, open, inclusive and resilient rules-based order in the region**.
    - ◆ **Australia-India Indo-Pacific Oceans Initiative Partnership (AIPOIP)** helps shape maritime cooperation in Indo-Pacific.
    - ◆ **Supply Chain Resilience Initiative** by Australia, India, and Japan was launched for diversification of supply chain in the region.
  - ⊕ Shared interests in **balancing China's growing assertiveness**.
  - ⊕ Both are **members of the Quad**, along with Japan and US.
  - ⊕ Bilateral strategic partnership was elevated to **Comprehensive Strategic Partnership in 2020**.
- **Key defence cooperation**
  - ⊕ **Military Logistics Support Agreement** facilitates sophisticated logistic cooperation.
  - ⊕ **Defence Science & Technology Implementing Arrangement** facilitates interaction between **defence research organizations** in two countries.
  - ⊕ **Information Fusion Centre - Indian Ocean Region (IFC-IOR) liaison officer** to enhance maritime situational awareness.
  - ⊕ **Joint Military Exercises:** AUSINDEX, Malabar, AUSTRALIND, PITCH BLACK.
  - ⊕ Other areas of cooperation include **cyber security, ocean-born trade security, etc.**

## Also in News

### India Australia RISE Accelerator program

Atal Innovation Mission (NITI Aayog) and **Australia's national science agency (CSIRO) launched Rapid Innovation and Startup Expansion (RISE) accelerator program.**

- It will **support Australian and Indian circular economy startups and small-to-mid-sized enterprises (SMEs)**.
  - ⊕ A **circular economy** entails markets that give **incentives to reusing products**, rather than scrapping them and then extracting new resources.
- **Program will be delivered virtually with opportunities to travel** between both countries.
- Participating startups may also be eligible for up to **Rs. 40,00,000 in non-equity grants**.

### Ghol or Black spotted Crocker

- Gujarat declared **Ghol** species as the **state fish** at the Global Fisheries Conference India 2023.
- Ghol fish is widely distributed in **Indo-Pacific from Persian Gulf to Pacific Ocean**.
  - ⊕ Its **swim bladders are highly priced** because of their medicinal and commercial values.
  - ⊕ It is **exported to countries of south-east Asia** (Hong Kong, Singapore and Malaysia).
  - ⊕ **Usage:**
    - ◆ To prepare **isinglass** (a form of **collagen used mainly for the clarification of wine and beer**).
    - ◆ **Traditional medicine** (believed to prevent bleeding in patients with urinary problems).
    - ◆ **Cosmetics**.

### Lancet Countdown on Health and Climate Change report 2023

- **Key highlights**
  - ⊕ **Global potential loss of income** from the reduction in labour capacity due to extreme heat was **\$863 billion in 2022**.
    - ◆ It affected low and **medium Human Development Index countries** the most (particularly agricultural sector), **exacerbating global inequities**
  - ⊕ Climate change is **exacerbating food insecurity** by undermining crop yields, threatening food security of populations dependent on marine resources, etc.
- **Recommendation:**
  - ⊕ **Health-centred approach** to address climate crisis, Just, equitable, and rapid **phase-out of fossil fuels, etc.**

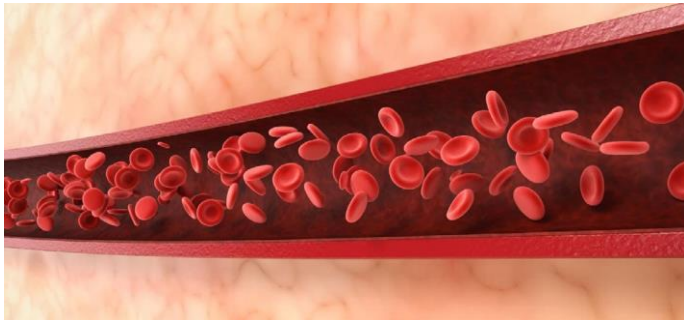
### Gambusia (mosquitofish)

- A new study has **revealed that two species of mosquitofish, Gambusia affinis and Gambusia holbrooki, have invaded various ecosystems across India.**
- **About Gambusia:**
  - ⊕ The species has been widely introduced worldwide as a form of biological mosquito control; it feeds on mosquito larvae.
  - ⊕ **Native:** to the U.S
  - ⊕ **Habitat:** shallow waters and penetrate dense vegetation growth where larvae and pupae hide.
  - ⊕ It is among the **prominent invasive alien species**.
  - ⊕ **In 1928**, Gambusia was first introduced in India during British rule.



## Haemoglobin in epidermis

- Study shows the presence of haemoglobin in the epidermis.
- About Epidermis:**
  - It is the **outermost layer of the skin**, forming a protective barrier against the external environment.
  - It is made up of **five sublayers** that work together to continually rebuild the **surface of the skin**.
  - Various cells in the epidermis:** Keratinocytes, Melanocytes, Langerhans cells, and Merkel cells.
- Haemoglobin** is a protein found in red blood cells, It has been identified in **keratinocytes of the upper epidermis**.
  - It **binds gases and exhibits** antioxidant properties, potentially contributing to barrier function.



## Langlands Program

- Recently, a report claimed that the **Langlands Program** can be likened to **building bridges**.
- Langlands Program**
  - The program attempts to find connections between **number theory** and **representation theory**.
  - It was set in **motion in 1967** by **Dr. Robert Langlands** at Princeton University.
  - In 2018**, **Dr. Langlands** was awarded the **Abel Prize** for the Langlands program.
    - Abel Prize is one of the highest honors for mathematicians which was established by the Norwegian Parliament in 2002.



## Jupiter Icy Moons Explorer (JUICE Mission)

- European Space Agency's (ESA) JUICE probe will use **double gravity assist**, for the first time, from Earth and Moon to propel itself towards Jupiter.
- Double Gravity assist** is a technique by which a spacecraft, with the help of the gravitational field of two celestial bodies, gets a speed boost.
- About JUICE:**
  - The **spacecraft was launched earlier** this year, to study Jupiter and its three icy and potentially ocean-bearing moons – **Ganymede, Callisto, and Europa**.
  - Objectives:** find out whether there could be places where the necessary conditions (water, biological essential elements, energy, and stability) to sustain life are present.
  - Period:** It has **embarked on an eight-year cruise** and will reach in 2031.
- Other Missions to Jupiter:** Galileo, Juno, Europa Clipper, etc.



## Ionosphere

- Gamma-ray burst (GRB) in faraway galaxy disturbed Earth's **Ionosphere**.
  - GRBs are **short-lived bursts of gamma-ray light** (most energetic form of light).
  - They can last from **a few milliseconds to several minutes**
  - They shine hundreds of times **brighter than a typical supernova**.
- Ionosphere, stretching **50 to 400 miles above Earth's surface**, forms a **boundary between Earth's lower atmosphere and vacuum of space**.
  - It contains **electrically charged gases called plasma**.
  - Satellites are deployed in this layer** including International Space Station
- It is **important for communications** as it reflects and modifies radio waves used for communication and navigation.

## Places in news



## Suriname (Capital: Paramaribo)

- An illegal gold mine collapsed in Suriname.
- Political Features:**
  - Located on the **northern coast of South America and is not landlocked** (opens into Atlantic Ocean).
- Bordering nations:** **French Guiana** (east), **Brazil** (south), and **Guyana** (west).
- Geographical Features:**
  - Vegetation:** Majorly Tropical rainforest.
  - Major rivers:** Marowijne, Corantijn (Courantyne), Coppename, Suriname, etc.
  - Highest Point:** Juliana Top
  - Minerals:** One of the **top producers of Bauxite** in the world.

