

GE F414 FIGHTER JET ENGINE

The American multinational corporation General Electric (GE) recently announced it had signed an agreement with India's state-owned Hindustan Aeronautics to jointly make GE F414 Fighter Jet Engines in India.



About GE F414 Fighter Jet Engine:

- It is a **high-performance, two-spool, axial-flow turbofan engine** that is used to power a variety of military aircraft, including the F/A-18E/F Super Hornet, the JAS 39 Gripen, and the Tejas Mark II.
- It is a **derivative of the GE F404 engine**, which was developed in the 1970s.
- It has been used by **U.S. Navy aircraft for more than 30 years**.
- The F414 powers or is on order to power jets in the **S., Sweden, Australia, Kuwait, Brazil, South Korea, India and Indonesia**.

Features:

- It combines the proven reliability, maintainability, and operability of its successful F404 predecessor with advanced technologies to **provide up to 35 percent more thrust**.
 - It's simple, **modular design is reliable and easy to maintain**.
 - It is the **first fighter engine to use a Full Authority Digital Electronic Control (FADEC)**. FADEC provides precise control of the engine's performance, which improves fuel efficiency and reduces emissions.
 - Is the **first fighter engine to use an integrated electronic engine instrumentation (IEE) system**. IEE provides real-time data on the engine's performance, which helps pilots to make informed decisions about engine operation.
 - Its wide chord, **high-pressure compressor (HPC) provides greater efficiency and lower emissions** than previous generation engines.
 - The engine's **low-pressure turbine (LPT) is designed for high efficiency and durability**.
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WHITE-RUMPED VULTURE

To revive the vulture population in the state of Madhya Pradesh, 20 white-rumped vultures were recently brought to Vulture Conservation Centre in Kerwa from Pinjore in Haryana.



About White-Rumped Vulture:

- It is a **medium-sized Old-World vulture**.
- **Scientific name: Gyps bengalensis**
- It is also known as **Indian White-backed Vulture** or **Oriental White-backed Vulture**.
- **Distribution: Pakistan, India, Bangladesh, Nepal, Bhutan, Myanmar (Burma), Thailand, Laos, Cambodia, and southern Vietnam.**
- **Habitat:** Found mostly in **plains and less frequently in hilly** It can also be seen in **villages and cities** near to cultivation.
- **Population:**
 - In the 1980s, the global population was estimated at several million individuals, and it was thought to be "the most abundant large bird of prey in the world".
 - **As of 2021, the global population was estimated at less than 6,000 mature individuals.**
- **Features:**
 - It is a typical, **medium-sized vulture**, with an **unfeathered head and neck**, very **broad wings**, and **short tail feathers**.
 - Adults are **75 to 85 cm tall**, their **wing span is 180 to 210 cm**, and their **weight ranges from 3.5 to 7.5 kg**.
 - The **sexes are approximately equal** in size.
 - **Adults are darker** than juveniles, with **blackish plumage**, a **white neck-ruff**, and a **white patch of feathers on the lower back** and upper tail, from which their common name is derived.
 - There is a **pale grey patch on the upper surface of the wings**, visible when the wings are folded. The **undersides of the wings are a dark slate to brownish colour**.
- **Conservation Status:**
 - **IUCN: Critically Endangered**
 - **Wildlife Protection Act 1972: Schedule-1**

EGYPT



About Egypt:

- **Location:** Egypt is a **transcontinental country** situated in **northeastern Africa and the Sinai Peninsula in Western Asia (Middle East)**.
 - **Capital:** **Cairo**
 - **Boundaries:**
 - The country borders the **Mediterranean Sea to the north** and the **Gulf of Suez and the Red Sea to the east**.
 - It is bordered by **Libya** in the west, the **Palestinian territory (Gaza Strip)** and **Israel** in the northeast, and **Sudan** in the south.
 - It shares **maritime borders with Cyprus, Turkey and Greece** in the Mediterranean Sea, and with **Jordan and Saudi Arabia** in the Red Sea.
 - **Independence:** Modern Egypt became **independent in 1922**.
 - **Population:** With **12 million** inhabitants (2021), Egypt is the **most populous country in the Arab world**.
 - **Language:** Spoken language is **Modern Standard Arabic**; the **colloquial language is the Egyptian-Arabic dialect (Masri)**.
 - **Religion:** **Islam** is the dominant religion in Egypt with an estimated **85-90% of the population is Sunni Muslim**.
 - **Major rivers:** The famous River Nile is the **only river that flows in Egypt throughout the year**. Around 98% of the country's population resides in the Nile River Valley.
- Suez Canal:**
- It is a **30 km (120 miles)-long artificial sea-level waterway located in Egypt**.
 - It **connects the Mediterranean Sea with the Gulf of Suez**, a northern branch of the Red Sea.
 - It provides the **shortest maritime route between Europe and the lands lying around the Indian and western Pacific oceans**.

PM MODI ARRIVES IN EGYPT FOR TWO-DAY STATE VISIT

Why in news?

- PM Modi began his maiden state visit to Egypt by holding discussions with the "**India Unit**" in the Egyptian Cabinet.
- This India Unit was set up earlier this year following the State Visit of President of Egypt, Abdel Fattah El-Sisi, to India as Chief Guest for Republic Day 2023.
- The India Unit is headed by the Prime Minister of Egypt Mustafa Madbouly, and comprises a number of Ministers and senior officials.
- This is the **first bilateral visit by an Indian Prime Minister to the country in 26 years.**

India – Egypt Bilateral Relation: in brief

- India and Egypt enjoy warm and friendly relations marked by civilizational, cultural and economic linkages and deep-rooted people-to-people ties.
- In 2023, India and Egypt are celebrating 75 years of establishment of diplomatic relations this year.
- President of Egypt, Abdel Fattah El-Sisi, was the **Chief Guest at India's Republic Day on 26 January 2023.**
- This was for the **first time** that President of the Arab Republic of Egypt has been invited as Chief Guest on our Republic Day.
- During this visit, **both sides decided to elevate the relationship to Strategic Partnership** covering political, security, defence, energy and economic areas.
- Egypt has also been invited as a 'Guest Country' during India's Presidency of G-20 in 2022-23.

Trade relation

- Bilateral trade between India and Egypt achieved a record high of USD 7.26 billion in FY 2021-22.
- The trade was fairly balanced, with USD 3.74 billion Indian exports to Egypt and USD 3.52 billion imports from Egypt to India.

- During this period (FY21-22), India was the **6th largest export destination** and **6th most significant source of imports** as well.
- **During April 2022-January 2023 period of FY 2022-23**, the bilateral trade has reached nearly USD 4.4 billion, with USD 2.9 billion worth exports from India and USD 1.5 billion worth imports from Egypt to India.
- More than 50 Indian companies have invested around USD 3.15 billion in diverse sectors of Egyptian economy, including chemicals, energy, textile, garment, agri-business, retail, etc.

Defence cooperation

- **Desert Warrior** exercise was conducted as the first-ever joint tactical exercise by the air force of the two countries.
- The more recent exercise between the special forces is another indication of the growing willingness to work together.
- The Egyptians have also shown some interest in India's Tejas fighter jets and Dhruv light attack helicopters.
- A military contingent from the Egyptian Army participated in this year's Republic Day parade.

Cooperation during Covid-19 & Russia – Ukraine war

- When India was hit hard by the second wave of COVID-19, Egypt responded by dispatching three plane loads of medical supplies and providing 300,000 doses of Remdesivir in May 2021.
- India reciprocated a year later when Egypt, the world's largest importer of wheat, was facing a dire situation following the abrupt halt in wheat shipments from Ukraine following the war.
 - In May last year, India — which had put a ban on sale of wheat — allowed export of 61,000 tonnes to Egypt.

Development cooperation

- **The grants-in-aid projects include:**
 - Pan Africa Tele-medicine and Tele-education project in Alexandria University, Solar electrification project in Agaween village and Vocational Training Centre for textile technology in Shoubra, Cairo, which have been completed.

- **Technical cooperation and assistance**

- Since 2000, over 1300 Egyptian officials have benefited from ITEC (Indian Technical and Economic Cooperation) and other programs like ICCR (Indian Council for Cultural Relations) and IAFS (India Africa Forum Summit)

Cultural relation

- The Maulana Azad Centre for Indian Culture (MACIC) has been promoting cultural cooperation between the two countries.
- The iconic Cairo Tower (which is the tallest tower in North Africa) was illuminated with Indian National Flag in the evening of 15th August 2021.

News Summary:

- Prime Minister Narendra Modi arrived in Egypt's capital Cairo for the first state visit on the second leg of his two-nation tour.

Key highlights

- The Prime Minister began his visit with discussions with Egyptian Prime Minister Madbouly and top Cabinet ministers to deepen trade relations and further strengthen the strategic partnership.
- He also met the members of the Indian diaspora and the **Bohra community**.
 - His meeting with the Bohra community members comes ahead of his visit to Cairo's historic Al-Hakim Mosque, restored with the help of India's Dawoodi Bohra community.
 - The Bohra community in India originated from the Fatima dynasty and they have renovated the mosque from the 1970s onwards.
- He will visit the **Heliopolis War Cemetery** to pay respects to the Indian troops who gave their lives in the ultimate act of valour for Egypt during World War-1.
 - This memorial was built by the Commonwealth.
 - It is dedicated to the 3,799 Indian troops who lost their lives in different First World War conflicts in Egypt.

WHAT ARE AURORAS?

Recently, an international team of researchers revealed global observations of auroras associated with carbon dioxide using satellites.



About Auroras:

- **How is it formed?** The sun is ejecting charged particles from its corona, creating solar wind. When that wind slams into Earth's ionosphere, the aurora is born.
- In the Northern Hemisphere, the phenomenon is called the northern lights (aurora borealis), while in the Southern Hemisphere, it's called the southern lights (aurora australis).
- The hemispheric asymmetry of the aurora is due in part to **the sun's magnetic field interfering with Earth's magnetic field.**
- The usually observed green and red auroras **happen between 100 kilometres and 250 kilometres above the surface of the planet** due to an excited state of atomic oxygen.

What is Carbon Dioxide Aurora?

- When charged particles crash into the planet's atmosphere, they interact with many different atoms and molecules. Carbon dioxide is one of them.
- While the gas is known for acting as a greenhouse gas due to its presence in the lowest part of the atmosphere, trace parts of carbon dioxide also exist in the atmosphere at the edge of space.
- When **carbon dioxide molecules** about 90 kilometres above Earth become **excited during an aurora, they emit infrared radiation.**
- This **leads to more infrared radiation** than is typically observed in the planet's atmosphere.

WHAT IS LAB-GROWN MEAT AND WHAT DID THE U.S. RECENTLY APPROVE?

Why in News?

- Two U.S. companies, Good Meat and Upside Foods, have received the U.S. Food and Drug Administration (FDA) approval to make and sell their cell-cultivated chicken.
- The first country to approve the sale of alternative meat was Singapore in 2020.

What is Cultivated Meat?

- To make cell-cultivated meat, these two companies isolate the cells that make up this meat (the meat that we consume).
- They then put the isolated cells in a setting where they have all the resources they need to grow and make more copies of themselves.
- These resources are typically nutrients, fats, carbohydrates, amino acids, the right temperature, etc.
- The ‘setting’ in which this process transpires is often a bioreactor (also known as a ‘**cultivator**’).
- This cultivator is a sensor-fit device – like a container – that has been designed to support a particular biological environment.
 - Because of the techniques involved, producing meat in this way is also called **cellular agriculture**.
- Once these cells have become sufficiently large in number, they resemble a mass of minced meat.
- They are collected and then processed, with additives to improve their texture and/or appearance, and are destined for various recipes.

What is the Need to Create Cell-Cultivated Meat?

- The proponents of cell-cultivated meat have advanced the following arguments in favour of developing lab-grown meat –
 - Emissions, Land Use, Prevention of Animal Slaughter, Food Security, and Customisation.
- The FAO has estimated that global **livestock is responsible for 14.5% of all anthropogenic greenhouse-gas emissions**.
 - Of this, the production of beef as a commodity accounted for 41%, whereas chicken meat and eggs accounted for 8%.
 - Similarly, the 2021 report estimated that **lab-cultivated meat would use 63% less land in the case of chicken and 72% in the case of pork**.

- Climate scientists have also asked people – especially in richer countries – to reduce their meat consumption, but carnivorous diets remain popular, in turn **maintaining lab-grown meat as a promising alternative**.
- Its proponents have also advanced such meat as a way to meet the world’s nutritional security needs.
- Finally, some experts have said that **lab-grown meat can be customised to be healthier than their animal counterpart**, such as being designed to contain less fat, thus contributing to public health.

Challenges Involved with Cell-Cultivated Meat:

- **Consumer Acceptance –**
 - Perfectly substituting animal meat with alternative meat requires the latter to match the former’s taste, texture, and appearance, and cost.
- **Cost –**
 - The cost of cell-cultivated meat is expected to remain high in the near future.
- **Resources –**
 - For the cellular cultivation process, researchers require –
 - high quality cells to begin with;
 - a suitable growth-medium in which the cells can be cultured,
 - other resources required to maintain the quality of the final product.
- **Criticism –**
 - A new study discovered that if growing cells for cultured meat requires a very specialized and purified liquid for their growth, similar to what the pharmaceutical industry uses, then the environmental impact of producing cultured meat in the near future could be much worse than the average production of beef by several times.