

News Analysis (07 Dec, 2020)

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Rohingyas at Isolated Bangladesh Island

Why in News

Recently, authorities in **Bangladesh** sent the first group of more than **1,500 Rohingya refugees** to an isolated **Bhasan Char island** in the Bay of Bengal.



Key Points

- **Background:**

- The **Rohingya** people are stateless, **Indo-Aryan ethnic group** who reside in **Rakhine State, Myanmar**.
- There were an estimated **1 million Rohingya living in Myanmar before the 2016–17 crisis**. An estimated **625,000 refugees from Rakhine, Myanmar, had crossed the border into Bangladesh since August 2017**. The majority are Muslim while a minority are Hindu.
- They are described by **the United Nations (UN)** as **one of the most persecuted minorities in the world**.
- The Rohingya population is **denied citizenship under the 1982 Myanmar nationality law**. They have denied the Rohingya the possibility of acquiring a nationality. Although **Rohingya history in the region can be traced back to the 8th century**, Myanmar law does not recognize the ethnic minority as one of the eight national indigenous races.
- The flow of Rohingya from Myanmar intensified in 2017 and the **coast near the Bangladeshi city of Cox's Bazar** was taken over by refugee settlements.
- In **June 2015**, the Bangladesh government **suggested** resettling **Rohingya refugees** on the **Bhasan Char island** under its **Ashrayan Project**.

- **Recent development:**

The Bangladesh government is moving these refugees to an isolated island known as **Bhasan Char** which is located **21 miles (34 kilometers) from the mainland**.

Bhasan Char:

- **Bhasan Char (Floating Island)** also known as **Char Piya or Thengar Char Island**, is an island in **Hatiya, Bangladesh**. It surfaced only **20 years ago and was never inhabited**.
- It was formed with **Himalayan silt from the mouth of river Meghna in 2006 spanning 40 square kilometres**.
- The island, which was once regularly **submerged by monsoon rains, now has flood protection embankments, houses, hospitals and mosques** built at a cost of more than 112 million dollars by the **Bangladesh navy**.

It is **underwater from June to September** because of the **monsoon**.

- **Concern:**

- As **Bhasan Char** falls in an **ecologically fragile** area prone to **floods, erosion and cyclones**, it is **not considered safe for human settlements**.
- **The UN** and various other human rights agencies are against this relocation as they believe that **Rohingya refugees must be able to make a free and informed decision** about relocating to the island based upon relevant, accurate and updated information.
- Earlier this year, **Amnesty International** released a **damning report** on the conditions faced by **Rohingyas** already living on the island.

The report contained allegations of cramped and unhygienic living conditions, limited food and healthcare facilities, a lack of phones, as well as cases of sexual harassment by both the Navy and local labourers engaging in extortion.

- **India's Stand:**

- India maintains that Rohingyas are a **threat to its national security and have links with international terror groups**.
- India has so far **refused to exert any pressure on Myanmar** for taking the Rohingyas back and giving them recognition as the citizens of Myanmar.

- **International Provisions to Protect the Rights of Rohingyas:**
 - **International Covenant on Civil and Political Rights (ICCPR):** Even though the refugees are foreigners in the country of asylum, by virtue of **Article 2 of the ICCPR, 1966**, they could enjoy the **same fundamental rights and freedoms as nationals**.
The right to equality before the law, equal protection of the law and non-discrimination which form a cornerstone of international human rights laws call for banning discrimination against refugees based on their status as such.
 - **The 1951 Refugee Convention :** The core principle of the convention is **non-refoulement**, which asserts that a **refugee should not be returned to a country where they face serious threats to their life or freedom**.

Way Forward

- While **pressing for eventual repatriation**, Bangladesh and external partners should move past short-term planning and **work together to build safe housing, improve refugees' educational and livelihood opportunities, and support refugee-hosting communities**. Bangladesh should also roll back its counterproductive security measures and plans for **relocations to Bhasan Char**.
- It is not too late for **Myanmar** to change course and **reorient itself to transform into a democracy that embraces human rights for all**, by **addressing issues of discrimination, implementing victim-centered justice mechanisms, rewriting laws and holding those who have violated human rights accountable**.

Source:BS

Covid-19 and Extreme Poverty: UNDP

Why in News

A new study from the **United Nations Development Programme (UNDP)** has found that an **additional 207 million people could be pushed into extreme poverty by 2030** due to the severe long-term impact of the **coronavirus pandemic**, bringing the total number of the world's extremely poor to more than a billion.

- The study is part of a long-standing partnership between the **UNDP** and the **Pardee Center for International Futures** at the University of Denver (USA).
- The study assesses the impact of **different Covid19 recovery scenarios** on the **Sustainable Development Goals (SDGs)**, evaluating the multidimensional effects of the pandemic over the next decade.

Key Points

- **Findings:**

- Under a ‘**Covid Baseline**’ scenario (based on current mortality rates and the most recent growth projections by the **International Monetary Fund** - IMF), **44 million people could be pushed into extreme poverty by 2030** as a result of the pandemic.
The World Bank defines “extreme poverty” as **living on less than 1.90 USD per person per day**.
- Under a ‘**High Damage**’ scenario, where the recovery is protracted, **Covid 19** is likely to push an additional **207 million people** into extreme poverty by 2030.
 - It could increase the **female poverty headcount by an additional 102 million**.
 - The ‘High Damage’ scenario anticipates that 80% of the Covid-19 induced economic crisis would persist in 10 years’ time due to **loss in productivity, preventing a full recovery to the growth trajectory** seen before the pandemic.

- **Suggestions:**

- A focused set of **Sustainable Development Goals (SDGs) investments over the next decade** in social protection/welfare programmes, governance, digitalisation, and a green economy could not only **prevent the rise of extreme poverty** but actually exceed the development trajectory the world was on before the pandemic.
This ambitious, SDGs Push scenario would lift an additional **146 million people out of extreme poverty, narrow the gender poverty gap, and reduce the female poverty headcount** by 74 million.
- The concerted SDG interventions combine **behavioural changes through both governments and citizens**, which are as follows:
 - Improvement in **effectiveness and efficiency** in governance.
 - Changes in **consumption patterns** of food, energy and water.
 - Global **collaboration** for climate action.
 - Additional **investments** in Covid-19 recovery.
 - Need for improved **broadband access and technology** innovation.

Source:IE

Recovery from Coal Mining in Meghalaya’s Moolamyliang

Why in News

Moolamyliang, a village in **Meghalaya’s East Jaintia Hills district**, is making progress in becoming a greener place amid abandoned pits from the **rat-hole mining**.

Key Points

- **Background:**

- The **Jaintia Coal Miners and Dealers’ Association** claims there are around 60,000 coal mines across 360 villages in East Jaintia Hills district.
- Moolamyliang used to be one such village until the **National Green Tribunal (NGT) banned** hazardous rat-hole coal mining in Meghalaya in **April 2014** and set a time limit for transporting the coal already mined till that time.
- Though the NGT **ban did not stop illegal mining** in the district, it **helped Moolamyliang reform**.

- **Coal Mining in Northeast:**

- In the northeast, **coal mining** is part of a larger trend which is the **decimation of natural resources**.
 - For example, there is large-scale **deforestation going on in the Garo and Khasi Hills** of Meghalaya, besides **limestone mining** in the **Jaintia Hills**.
 - Assam, which has lost most of its once extensive forest cover, sees **poaching in the Dima Hasao region**, **coal mining** in Upper Assam, and **sand/stone mining** from river beds.
- There are three notable **peculiarities of coal mining in the Jaintia Hills** (and elsewhere in Meghalaya).
 - Being a tribal state where the **6th Schedule applies**, **all land is privately owned**, and hence coal mining is done by private parties. The schedule **does not explicitly refer to mining**.
 - The **sizable coal deposits** in the state, mostly in the Jaintia Hills, **occur in horizontal seams only** a few feet high that run through the hills which is why **rat-hole mining is practised instead of open cast mining**.
 - **Most of the labour** (including children) comes from Nepal, the **poorer areas** of Assam, and Bangladesh. In Meghalaya, the non-tribal is a second-class citizen, as is the poor tribal, which explains the **general lack of concern even within the State about the trapped miners**.
- **Rat-hole Mining:**

It is a term used for a **hazardous and arduous mining technique** where miners crawl into winding underground tunnels that are just 4-5 feet in diameter to extract coal from the deep seams with a pickaxe.
- **Open Cast Mining:**

It is a **surface mining technique** of extracting rock or minerals from the earth by their removal from an open-air pit, sometimes known as a **borrow**.

- **Concerns:**

- **Ecological Issues:** Unsustainable mining in hilly areas **contaminates the farmlands and turns the streams acidic**, leading to the **loss of biodiversity and local heritage**.
- **Health Issues:** The prevalence of mining in an area **causes various diseases** like **fibrosis**, pneumoconiosis and **silicosis** in workers as well as locals.
- **Child Labour and Trafficking:** Majority of the workers involved in 'rat-hole' mining are children. They are suited for this job because of their small anatomy that fits small mine tunnels. Rat-hole mining has **encouraged child trafficking** apart from **engaging with immigrants** from many states.
- **Corruption: Police officials often collaborate with mine owners** in states where the open cast mining and rat hole mining are the norms.

- **Measures:**

- The administration tried to make coke factories and cement plants in the vicinity contribute to **earth rejuvenation programmes** in the area under their **Corporate Social Responsibility** (CSR).
- Among the projects being pursued is **low-cost rainwater harvesting** for **recharging the area** that has become dry because of coal mining.
- Making Moolamyliang a **base camp for tourists to explore caves, canyons and waterfalls** in parts of East Jaintia Hills that have escaped the impact of mining, will **boost tourism and bring in revenue**.
- Since the 6th Schedule does not explicitly refer to mining, **environmental activists are calling for the coal trade to come under central mining and environmental laws**.

Government Initiatives Related to Mining

- In **April 2018**, the Ministry of Coal launched the **Unlocking Transparency by Third Party Assessment of Mined Coal (UTTAM) Application** for coal quality monitoring.
- **National Mineral Policy (NMP)** was approved in 2019, which emphasises on themes such as sustainable mining, boosting exploration, encouraging the use of state-of-the-art technology and skill development.
- In **September 2019**, **100% FDI under the automatic approval route was allowed** for the sale of coal and coal mining activities including associated processing infrastructure.
- In **January 2020**, the Parliament passed the **Mineral Laws (Amendment) Bill, 2020**.
 - It amends the **Mines and Minerals (Development and Regulation) Act, 1957** and the **Coal Mines (Special Provisions) Act, 2015**.
 - The **1957 Act** regulates the mining sector in India and specifies the requirement for obtaining and granting mining leases for mining operations.
 - The **2015 Act** provides for allocation of coal mines and vesting of the right, title and interest in and over the land and mine infrastructure together with mining leases to successful bidders with a view to ensure continuity in coal mining operations and production of coal.
 - The Bill **permits commercial coal mining for local and global firms** without imposing any end-user restrictions, also it extends the validity of clearances for mining leases expiring in 2020.

Source: TH

Right to Vote for NRIs

Why in News

Recently, the **Election Commission of India** (ECI) has informed the Ministry of Law and Justice that it is “**technically and administratively ready**” to extend the **Electronically Transmitted Postal Ballot System** (ETPBS) to **Non Resident Indian** (NRI) voters for elections next year in Assam, West Bengal, Kerala, Tamil Nadu and Puducherry.

Key Points

- **Background:**

- The ECI started to look for possible options after receiving **several requests from MPs, industrialists, ministers and also writ petitions by NRIs** in the **Supreme Court (SC)** in 2013 and 2014.
- After the **2014 Lok Sabha elections**, a **12-member committee** was set up to **study mainly three options** of:
 - Voting by post.
 - Voting at an Indian mission abroad.
 - Online voting.
- The committee ruled out online polling as it felt this could compromise “**secrecy of voting**” and also shot down the proposal to vote at Indian missions abroad as they **do not have adequate resources**.
- In **2015**, the panel finally recommended that NRIs should be given the “**additional alternative options of e-postal ballot and proxy voting**”, apart from voting in person.
 - Under proxy voting, a registered elector can delegate his **voting power to a representative**.
 - At present, postal ballots are **allowed** for certain categories of voters (**Service Voters**) living in India, which include:
 - Members of the Armed Forces.
 - Members of the Armed Police Force of a State, serving outside that State.
 - Persons employed under Government of India on post outside India.
- In **2017**, the Union Cabinet **passed the proposal on proxy voting rights** for NRIs and brought a Bill amending the **Representation of the People Act 1950**.
- However, the bill lapsed in Rajya Sabha due to **dissolution of the 16th Lok Sabha** and the proposal has not been revived yet.
 - The **ECI pushed only for postal voting rights** for NRIs instead of the proxy voting.
 - To extend the postal voting facility to overseas voters, the government only needs to **amend the Conduct of Election Rules 1961. It does not require Parliament’s nod**.

- **Current Voting Process for NRIs:**

- Voting rights for NRIs were introduced only in **2011**, through an **amendment to the Representation of the People Act 1950**.
- An NRI can vote in the constituency in **his/her place of residence**, as mentioned in the passport, is located.
- He/She can **only vote in person** and will have to **produce her passport in original at the polling station for establishing identity**.

- **Current Strength of NRI Voters:**

- According to a **United Nations** report of 2015, India’s diaspora population is the **largest in the world at 16 million people**.
- However, registration of NRI voters has been **very low** with a little over one lakh overseas Indians registered as voters in India.
- In the **2019 Lok Sabha elections**, roughly **25,000** of them flew to India to vote.

- **Process of Voting by Postal Ballots:**

- Any NRI interested in voting through the postal ballot will have to **inform the Returning Officer (RO) not later than five days after the notification of the election.**

The RO of a parliamentary or assembly constituency is **responsible for the conduct of elections in the parliamentary or assembly constituency.**

- On receiving such information, the **RO will dispatch the ballot paper electronically.**
- The NRI voters will **download the ballot paper, mark their preference** on the printout and send it back along **with a declaration attested by an officer appointed by the diplomatic or consular representative of India** in the country where the NRI is resident.
- However, it is not clear right now, if the voter will return the **ballot paper herself through ordinary post or drop it off at the Indian Embassy**, which may then segregate the envelopes constituency-wise and send them to the **Chief Electoral Officer** of the state concerned for forwarding to the RO.

- **Political Stand:**

- The committee had **consulted national political parties and the Ministry of External Affairs (MEA)** on the options being considered for NRIs to cast their vote abroad.
- Among parties, **only the NCP has expressed complete support** and according to the **BSP, BJP and CPI**, postal ballots were not a viable option due to time constraint. The **Congress was not in favour** of sending the postal ballot paper electronically.
- The MEA expressed **strong reservations over attesting the declaration** as the **process might be difficult in non-democratic countries.**

Non Resident Indian

- According to India's **Foreign Exchange Management Act 1999 (FEMA)**, NRI is an Indian citizen or Foreign National of Indian Origin residing outside India for **purposes of employment, carrying on business or vocation** in circumstances as would indicate an intention to stay outside India for an indefinite period.
- Visiting NRIs whose total income (which is defined as taxable income) in India is up to **Rs. 15 lakh during the financial year** will continue to remain NRIs **if the stay does not exceed 181 days.**

The **Union Budget 2020** proposed to **reduce this period to 120 days** for all NRIs.

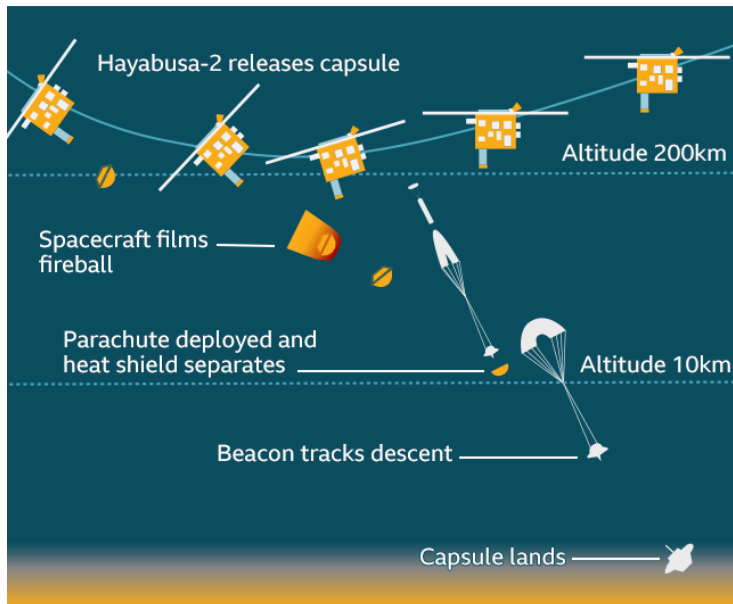
Source:IE

Dust Samples from Hayabusa 2

Why in News

Recently, **Japan Aerospace Exploration Agency (JAXA)** has received a capsule from the **unmanned Hayabusa 2**, carrying the **first extensive samples of dust** from the **asteroid Ryugu.**

Hayabusa-2 capsule to return to Earth



Key Points

- Hayabusa 2 was launched from **Japan's Tanegashima space centre in 2014** and took **four years to reach** the asteroid Ryugu.
 - The mission builds on the **original Hayabusa mission** that was launched in **2003** and successfully linked up with **asteroid Itokawa in 2005**.
It returned samples to Earth in **2010** marking the **first time when sample materials** from an asteroid were brought back to Earth.
 - Hayabusa is the Japanese term used for the **peregrine falcon**, which is the **fastest bird during its hunting dive** (200 mile per hour).
- The space probe **orbited above the asteroid for a few months to map its surface** before landing. Then it used **small explosives to blast a crater, collected the resulting debris** and headed back to Earth in November 2019.
- The craft's mission **seeks to answer some fundamental questions** about the **origins of the Solar system** and **where molecules like water came from**.
- **Significance:**
 - Asteroids and **comets** are **primitive bodies** that can be considered to be the **building blocks of the early Solar system** and they hold a **record of the birth and initial evolution**.
 - **Larger planets** like Earth went through a **more complex evolution over which the pristine materials were melted and altered significantly**. Due to this change, the materials found on large planets **do not hold information into their early stages of formation**.
 - Asteroids and **comets** retain a record of when, where and in what conditions they were formed. Exploration of these primitive bodies is **essential in gaining insight into the formation of the Solar system**.
Gases trapped in the rock samples could **reveal more about the chemical mixture** from the planets formed.
 - Significantly, among all the **reasons that will eventually cause the extinction of life on Earth**, an **asteroid hit** is widely acknowledged as one of the likeliest.

Asteroids

- Asteroids are also known as **minor planets** and are made up of **metals and rocks**.
- They **orbit the Sun** and have **shorter and elliptical orbits**.
- Most asteroids are **irregularly shaped**, though a **few are nearly spherical**.
- Many asteroids are known to have a **small companion moon** (some have two moons).
- There are also **binary (double) asteroids**, in which two rocky bodies of roughly equal size orbit each other, as well as **triple asteroid systems**.
- **Classification of Asteroids:**
 - **Main Asteroid Belt:** The majority of known asteroids orbit within the asteroid belt which is a torus-shaped region in the Solar system, located roughly **between the orbits of the planets Mars and Jupiter**.
 - **Trojans:** These asteroids **share an orbit with a larger planet**, but do not collide with it because they gather around two special places in the orbit (called the **L4 and L5 Lagrangian points**). There, the gravitational pull from the sun and the planet are balanced.
 - Lagrange Points:** These are positions in space where the **gravitational forces of a two body system** like the Sun and the Earth produce **enhanced regions of attraction and repulsion**. These can be used by spacecraft to reduce fuel consumption needed to remain in position.
 - **Near-Earth Asteroids:** These objects have orbits that **pass close by that of Earth**. Asteroids that actually cross Earth's orbital path are known as **Earth-crossers**.

Source: IE

Hampi Stone Chariot

Why in News

The **Archaeological Survey of India (ASI)** has taken steps to protect the **stone chariot** inside **Vittala Temple complex** at the **UNESCO World Heritage site of Hampi**.

ASI, under the **Ministry of Culture**, is the premier organization for the archaeological research and protection of the cultural heritage of the nation.



Key Points

- **Hampi Chariot:**

- It is **among three famous stone chariots in India**, the other two being in **Konark (Odisha)** and **Mahabalipuram (Tamil Nadu)**.
- It was **built in the 16th century** by the orders of **King Krishnadevaraya**, a Vijayanagara ruler.

Vijayanagara rulers reigned from **14th to 17th century CE**.

- It is a **shrine dedicated to Garuda**, the official vehicle of Lord Vishnu.

- **Vittala Temple:**

- It was built in the **15th century** during the rule of **Devaraya II**, one of the rulers of the **Vijayanagara Empire**.

- It is **dedicated to Vittala** and is also called **Vijaya Vittala Temple**.

Vittala is said to be **an incarnation of Lord Vishnu**.

- **Dravidian style** adorns the built of the complex, which is further enhanced with elaborate carvings.

- **Hampi:**

- It comprises mainly the **remnants of the Capital City of Vijayanagara Empire**. It is located in the **Tungabhadra basin** in central **Karnataka**.
- It was **founded by Harihara and Bukka in 1336**.
- Classified as a **World Heritage Site** by UNESCO (1986), it is also the **“World’s Largest Open-air Museum”**.
- **Famous places** include Krishna temple complex, Narasimha, Ganesa, Hemakuta group of temples, Achyutaraya temple complex, Vitthala temple complex, Pattabhirama temple complex, Lotus Mahal complex, etc.
- The **Battle of Talikota** (1565 CE) led to a massive destruction of its physical fabric.
Battle of Talikota, **confrontation in the Deccan region** of southern India between the forces of the **Hindu King of Vijayanagar** and the **four allied Muslim sultans** of Bijapur, Bidar, Ahmadnagar, and Golconda.

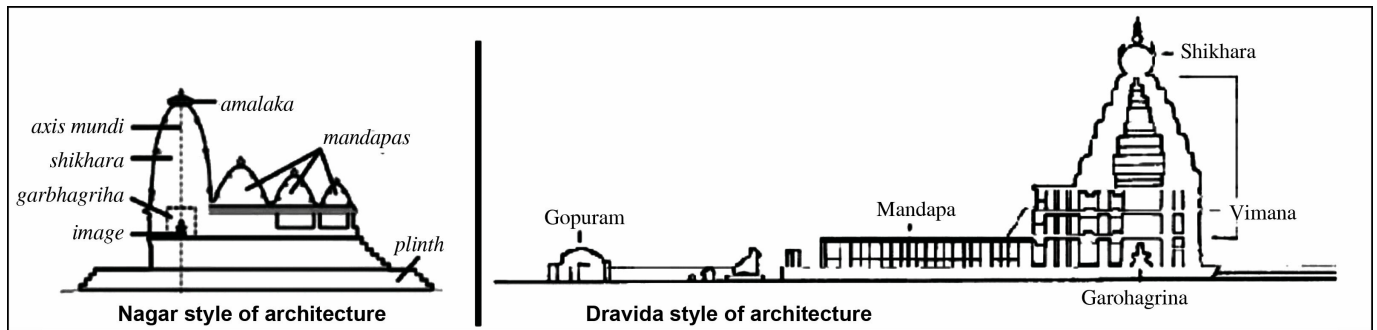
Vijayanagara Empire

- Vijayanagara or “city of victory” was the name of both a city and an empire.
- The empire **was founded in the fourteenth century (1336 AD)** by **Harihara and Bukka** of the **Sangama dynasty**.
- It **stretched** from the river Krishna in the north to the extreme south of the peninsula.
- Vijayanagar Empire was ruled by **four important dynasties** and they are:
 - Sangama
 - Saluva
 - Tuluva
 - Aravidu
- **Krishnadevaraya** (ruled 1509-29) of the **Tuluva dynasty** was the most famous ruler of Vijayanagar. His rule was characterised by expansion and consolidation.
 - He is credited with building some fine temples and adding impressive **gopurams** to many important south Indian temples. He also founded a suburban township near Vijayanagar called **Nagalapuram** after his mother.
 - He composed a work on statecraft in Telugu known as the **Amuktamalyada**.
- **Dravidian architecture** survives in the rest of Southern India spread through the patronage of the Vijayanagara rulers.
- Vijayanagara architecture **is also known** for its adoption of elements of **Indo Islamic Architecture** in secular buildings like the Queen’s Bath and the Elephant Stables, representing a highly evolved multi-religious and multi-ethnic society.

Dravidian Architecture

- **Two broad orders** of temples in the country are known - **Nagara in the north** and **Dravida in the south**. At times, the **Vesara style of temples** as an independent style created through the selective mixing of the Nagara and Dravida orders is mentioned by some scholars.
- **Features of Nagara and Dravida Orders of Temples:**
 - Unlike the nagara temple, the dravida temple is **enclosed within a compound wall**. The front wall has an entrance gateway in its centre, which is known as a **gopuram**.
 - The shape of the main temple tower known as **vimana** in Tamil Nadu is like a stepped pyramid that rises up geometrically **rather than the curving shikhara of North India**.

In the South Indian temple, the word ‘shikhara’ is used only for the crowning element at the top of the temple which is usually shaped like a small stupika or an octagonal cupola - this is equivalent to the **amlak and kalasha of North Indian temples**.
 - Whereas at the entrance to the **North Indian temple’s garbhagriha**, it would be usual to find images such as mithunas and the river goddesses, Ganga and Yamuna, in the **south** one will generally find sculptures of fierce **dvarapalas or the door-keepers** guarding the temple. It is common to find **a large water reservoir, or a temple tank**, enclosed within the complex.
- **Examples:**
 - **Nagara Style:** Kandariya Mahadeva Temple (Khajuraho), Madhya Pradesh
 - **Dravidian Style:** Brihadeshwara Temple and Mahabalipuram Temple, Tamil Nadu



Source: TH

Robotic Surgery

Why in News

Recently, **Insurance Regulatory and Development Authority of India (IRDAI)** has standardised health policies across all health insurers to even cover **robotic and bariatric surgeries**.

- **Bariatric surgery** is an operation that helps **lose weight** by making changes to the **digestive system**.
- Recently, India became the **first country to perform a telerobotic coronary surgery** on humans.

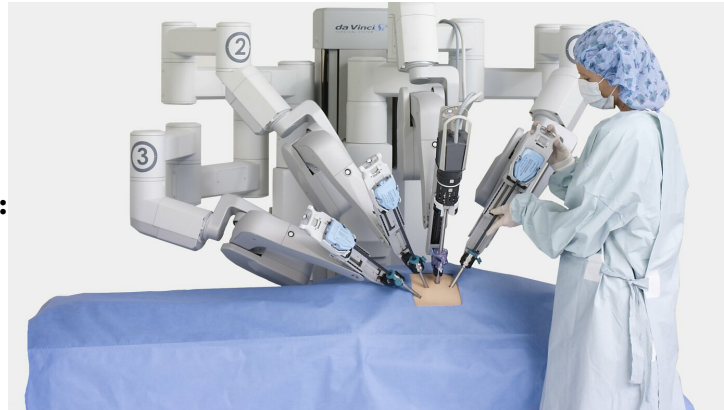
Key Points

- **Robotics:** It is the intersection of **science, engineering and technology** that produces machines, called **robots**, to **substitute for (or replicate) human actions**.

Application of Robotics:

- **Industrial Sector:** Industrial robots are electronically controlled, both programmable and reprogrammable to carry out certain tasks with high precision and accuracy.
- **Aerospace:** Another application of robots is in aerospace for outer space exploration. **Aerospace robots or unmanned robotic spacecraft** play a key role in outer space probes.
- **Outer Space: Robotic arms** that are under the control of a human being are employed to unload the docking cove of outer-space shuttles to launch satellites or to build a space station.
- **Exploration:** Robots can **enter the environments that are injurious to human beings**. An illustration is observing the atmosphere within a volcano or investigating our deep marine life.
- **Healthcare Delivery:** A highly possible advancement in healthcare is using robots in **Robotic Surgery**. Due to technological advancement, this is possible even if the patient is located in remote areas. This possibility defies distance.

- **Robotic Surgery:**



- **Robotic or Robot-assisted surgery** integrates advanced **computer technology with the experience of the skilled surgeons**. This technology provides the surgeon with a **10x magnified, high-definition, 3D-image** of the body's intricate anatomy.
- The surgeon **uses controls in the console to manipulate special surgical instruments** that are smaller, as well as more flexible and manoeuvrable than the human hand. The **robot replicates the surgeon's hand movements**, while **minimizing hand tremors**.
- **Benefits of Robotic Surgery:**
 - **Easy Procedures:** Makes the performance of complicated procedures much easier.
 - **Increases Flexibility, Precision and Control:** It allows doctors to perform different types of complex procedures with more **precision, flexibility, and control than possible with conventional techniques**.
 - **Reduces Trauma:** It reduces the trauma caused to the patient by allowing surgery to be performed through **small ports or 'keyholes' rather than via large incisions**.
 - **Simplifies Surgeries:** The instruments can access hard-to-reach areas of a patient's body more easily through **smaller incisions** compared with traditional open and laparoscopic surgeries.
 - **Reduces Recovery Time:** It helps in **shorter recovery times, with fewer complications and a shorter hospital stay**.
 - **Other Advantages:** Less pain and blood loss, and smaller, less noticeable scars.
- **Reasons for High Demand of Robotic Surgery:** Factors which are pushing the demand of robotic surgery are:
 - Advancements in technology.
 - Rising incidence of chronic diseases.
 - High incidence of medical errors.
 - Demand for faster recovery and reduction in pain.
 - Increase in awareness about the benefits of robot-assisted surgery.
- **Reasons for Slow Growth of the Sector:**
 - **High cost of installation:** Instruments are not only expensive but also incur a large **recurring cost due to the disposable nature** of instruments and ancillaries.
 - **Monopoly:** There exist only a **few companies that manufacture the equipment** for robotics surgery. the monopoly of few companies makes it difficult to expand robotics surgery in the Indian healthcare system.
 - **Untrained Resource:** Another challenge is the **unavailability of trained surgeons** for conducting robotic surgeries.

- **Robotic Surgery in India:**

- **Quality:** India is the **most preferred destination** for getting **high-quality treatment across the globe**, and is dotted with various **multi-speciality hospitals and patient-care centres**.
- **Infrastructure:** The hospitals are well equipped with advanced, highly sophisticated and **world-class infrastructure** facilities using state-of-the-art technologies for the treatment of various critical illnesses.
- **Cost:** India is very **affordable** unlike in the U.S., U.K., and Canada. Overall, the cost of such procedures in India is **pocket-friendly**, that too, **without compromising on the quality of services and infrastructure**.

Way Forward

- Government should establish **fellowship programmes and offer structured training to surgical teams**. With the increase in the number of robotic surgeries, there will be an acute need for training of doctors for carrying out such surgical processes. In India, training and certifying of surgeons remains a challenge.
- It should also **promote collaboration between hospitals and insurance companies** to come up with innovative ways to tackle the high cost of robotic surgeries.

Source:TH

China's Artificial Sun

Why in News

China successfully powered up its “**artificial sun**” **nuclear fusion reactor** for the first time recently, marking a great advance in the country’s **nuclear power research capabilities**. The nuclear reactor is expected to provide clean energy.

Key Points

- The **HL-2M Tokamak reactor** is China’s **largest and most advanced nuclear fusion** experimental research device, and scientists hope that the device can potentially unlock a powerful clean energy source.
HL-2M Tokamak device is used in it to replicate the **nuclear fusion process that occurs naturally in the sun**.
- It uses a **powerful magnetic field** to fuse **hot plasma** and can reach temperatures of over **150 million degrees Celsius**, approximately **ten times hotter than the core of the sun**.
- Located in **Sichuan province**, the reactor is often called an “**artificial sun**” **on account of the enormous heat and power it produces**.

- **Other Similar Experiment:**

- **International Thermonuclear Experimental Reactor**

- International Thermonuclear Experimental Reactor (ITER) is a collaboration of **35 nations launched in 1985.**
 - It is located in **France.**
 - **Aim:**
 - It aims to build the world's largest tokamak to prove the feasibility of fusion as a large-scale and carbon-free source of energy.
 - The tokamak is an **experimental machine designed to harness the energy of fusion.** Inside a tokamak, the energy produced through the **fusion of atoms** is absorbed as heat in the walls of the vessel. Like a conventional power plant, a fusion power plant **uses this heat to produce steam and then electricity by way of turbines and generators.**

Nuclear Reactions

- **Description:**

A nuclear reaction is the process in which two nuclei, or a nucleus and an external subatomic particle, collide to produce one or more new nuclides. Thus, a nuclear reaction must cause a transformation of at least one nuclide to another.

- **Types:**

- **Nuclear Fission:**

- The nucleus of an atom splits into **two daughter nuclei.**
 - This decay can be natural spontaneous **splitting by radioactive decay**, or can actually be simulated in a lab by achieving necessary conditions (**bombarding with neutrons, alpha particles, etc.**).
 - The resulting fragments tend to have a combined mass which is less than the original. The **missing mass is usually converted into nuclear energy.**
 - Currently **all commercial nuclear reactors are based on nuclear fission.**

- **Nuclear Fusion:**

- Nuclear Fusion is defined as the **combining of two lighter nuclei** into a heavier one.
 - Such nuclear fusion reactions are the **source of energy in the Sun** and other stars.
 - It takes considerable **energy to force the nuclei to fuse.** The conditions needed for this process are extreme millions of degrees of temperature and millions of pascals of pressure.
 - The hydrogen bomb is based on a **thermonuclear fusion** reaction. However, a nuclear bomb based on the fission of uranium or plutonium is placed at the core of the hydrogen bomb to provide initial energy.

Source:TH

Jupiter Saturn Great Conjunction

Why in News

In a rare celestial event, Jupiter and Saturn will be seen very close to each other (conjunction) on 21st December 2020, appearing like one bright star.

Key Points

- **Conjunction:** If two celestial bodies visually appear close to each other from Earth, it is called a conjunction.
- **Great Conjunction:** Astronomers use the term great conjunction to **describe meetings of the two biggest worlds** in the solar system, **Jupiter and Saturn**.
 - It happens **about every 20 years**.
 - The conjunction is the **result of the orbital paths of Jupiter and Saturn coming into line**, as viewed from Earth.
 - **Jupiter** orbits the sun about every **12 years**, and **Saturn** about every **29 years**.
 - The conjunction will be on **21st December, 2020**, also the date of the **December solstice**.
 - It **will be the closest alignment** of Saturn and Jupiter **since 1623**, in terms of distance. The **next time** the planets will be this close is **2080**.
 - They will **appear to be close** together, however, they will be **more than 400 million miles apart**.
- **Jupiter:**
 - Fifth in line from the Sun, Jupiter is, by far, the **largest planet in the solar system** – more than twice as massive as all the other planets combined.
 - Jupiter, Saturn, Uranus and Neptune are called **Jovian or Gas Giant Planets**.
 - These have thick atmosphere, **mostly of helium and hydrogen**.
 - Jupiter's iconic **Great Red Spot** is a giant storm bigger than Earth that has raged for hundreds of years.
 - Jupiter **rotates once about every 10 hours** (a Jovian day), but takes about **12 Earth years** to complete **one orbit of the Sun** (a Jovian year).
 - Jupiter has **more than 75 moons**.
 - The planet Jupiter's **four largest moons are called the Galilean satellites** after Italian astronomer Galileo Galilei, who first observed them in 1610.
 - These large moons, named **Io, Europa, Ganymede, and Callisto**, are each distinctive worlds.
 - In 1979, the **Voyager mission** discovered Jupiter's faint **ring system**.
 - **Nine spacecraft** have visited Jupiter. Seven flew by and two have orbited the gas giant. **Juno**, the most recent, arrived at Jupiter in 2016.
- **Saturn:**
 - Saturn is the **sixth planet from the Sun** and the **second largest** planet in the solar system.
 - Saturn takes about **10.7 hours to rotate** on its axis once - a Saturn "day" - and **29 Earth years to orbit** the sun.
 - Saturn has **53 known moons** with **an additional 29 moons** awaiting confirmation of their discovery - that is a total of **82 moons**. It has the **giant moon 'Titan'**.
 - Saturn has the **most spectacular ring system**, with seven rings and several gaps and divisions between them.
 - **Few missions** have visited Saturn: **Pioneer 11** and **Voyagers 1 and 2** flew by; But **Cassini** orbited Saturn 294 times from 2004 to 2017.

