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India's Stand on Nuclear Weapons

Why in News

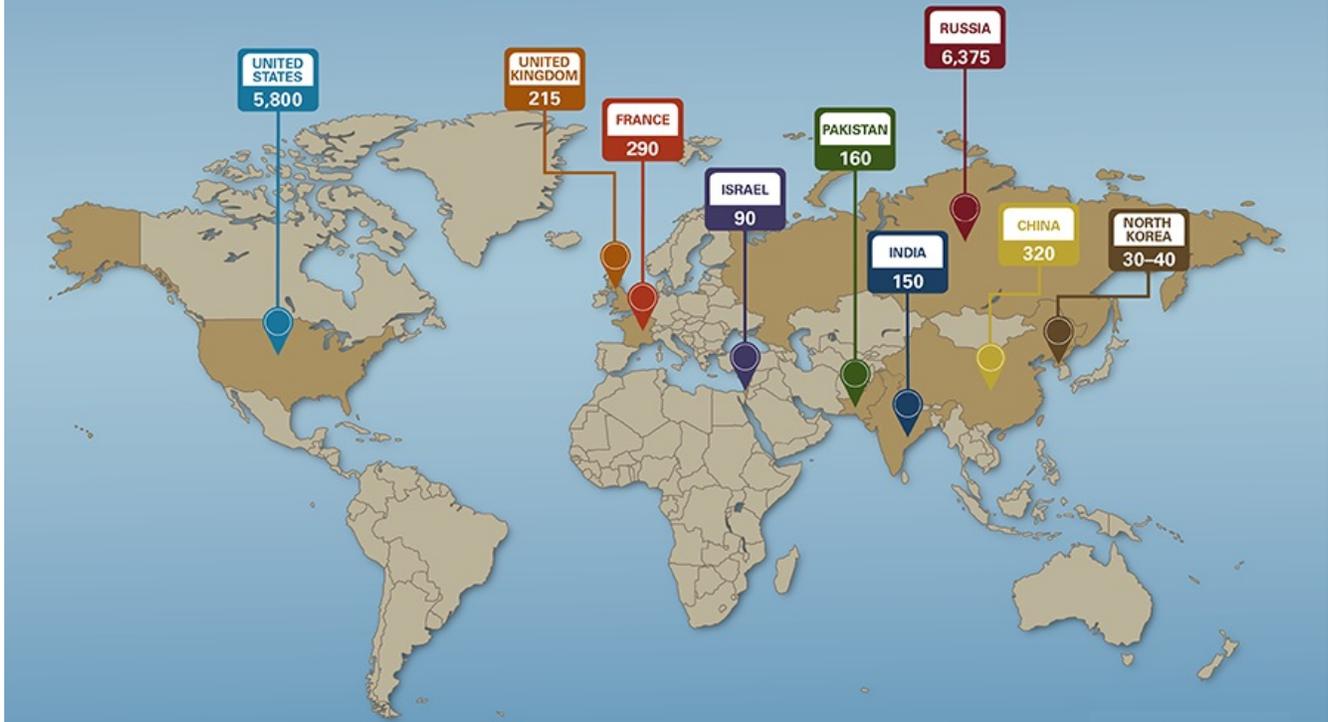
In the recent **High-level Meeting to Commemorate and Promote the International Day for the Total Elimination of Nuclear Weapons** (26th September 2020), India reiterated that nuclear weapons should be abolished in a step-by-step non-discriminatory process.

Key Points

- India remains committed to the **policy of No First Use** (NFU) **against nuclear weapon states** and **non-use against non-nuclear-weapon states**.
- The recent stand indicates that India has **not revised its key principles regarding the NFU principle**.
 - In 2019, the Defence Minister hinted at a possibility of changing the principle by declaring that '**circumstances**' will **determine the "No First Use" stance**.
- India is a key partner in **global efforts towards disarmament and strengthening the non-proliferation order**.
- India believes that nuclear disarmament can be **achieved through a step-by-step process** underwritten by a **universal commitment** and an **agreed multilateral framework** after meaningful dialogues among all States possessing nuclear weapons, for building trust and confidence.

2020 ESTIMATED GLOBAL NUCLEAR WARHEAD INVENTORIES

The world's nuclear-armed states possess a combined total of nearly 13,500 nuclear warheads; more than 90% belong to Russia and the United States. Approximately 9,500 warheads are in military service, with the rest awaiting dismantlement.



- The **Conference on Disarmament (CD)** remains the “**world’s single multilateral disarmament negotiating forum**” and India supports holding of negotiations on a **Comprehensive Nuclear Weapons Convention** at the CD.
- India also remains committed to negotiations regarding a **Fissile Material Cut-off Treaty (FMCT)** in the CD.
 - FMCT is a **proposed international agreement that prohibits the production of two main components of nuclear weapons: highly-enriched Uranium and Plutonium.**
 - The consultations under the treaty laid down the most appropriate arrangement to negotiate a treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices.
- **Global Efforts:**

The **Treaty on the Non-Proliferation of Nuclear Weapons (NPT)**, the **Comprehensive Nuclear-Test-Ban Treaty (CTBT)** and the **New START Treaty** (between the USA and the Russian Federation) are few of the most important global efforts towards nuclear disarmament.

India has not signed NPT and CTBT.

International Day for the Total Elimination of Nuclear Weapons

- In **2013**, the **UN General Assembly** (UNGA) declared **26th September** to be the International Day for the Total Elimination of Nuclear Weapons (**Nuclear Abolition Day**).
- **Objective:** Total elimination of nuclear weapons through enhancing public awareness and education about the threat posed to humanity by nuclear weapons and the necessity for their total elimination.
- Achieving **global nuclear disarmament is one of the oldest goals** of the United Nations.
- The UNGA resolution establishing the day, also **calls for progress on a nuclear weapons convention**, a global treaty involving the nuclear-armed states in the prohibition and elimination of nuclear weapons under strict and effective international control.

Source: TH

USA Aircraft Refuelling at A&N Islands

Why in News

Recently, a **USA Navy P-8A long range Maritime Patrol Aircraft (MPA)** landed at **Port Blair** in the Andaman and Nicobar (A&N) Islands for refuelling **under the bilateral logistics support agreement**.

This is the first time the USA got access to A&N under the **Logistics Exchange Memorandum of Agreement (LEMOA)**.

Key Points

- **LEMOA:**
 - It allows both countries to **have access to each other's designated military facilities** for refueling and replenishment.
 - Signed by India in **2016**.

- **Other foundational military communication agreements with the USA:**
 - **General Security of Military Information Agreement:**
 - GSOMIA allows **militaries to share the intelligence** gathered by them.
 - Signed by India in **2002**.
 - An extension to the GSOMIA, the **Industrial Security Annex (ISA)**, was signed at the 2+2 dialogue in **2019**.
 - ISA provides a framework for exchange and protection of classified military information **between the USA and Indian defence industries**.
 - **Communications and Information Security Memorandum of Agreement:**
 - Valid for 10 years, COMCASA aims to provide a legal framework for the **transfer of highly sensitive communication security equipment from the USA to India** that will streamline and facilitate interoperability between their armed forces.
 - Signed by India in 2018.
- **BECA:** The USA is looking forward to India signing the **Basic Exchange and Cooperation Agreement for Geo-Spatial cooperation (BECA)**, at the next India-USA 2+2 ministerial dialogue likely to be held in October, 2020.

BECA will **allow India to use the geospatial maps of the USA** to get pinpoint military accuracy of automated hardware systems and weapons such as cruise and ballistic missiles.
- **Strategic Significance of A&N Islands:**
 - It is **close to the Strait of Malacca** and global sea lanes of communication.
 - A&NI has become an important element of **India's "Act East Policy"** of engaging with countries in the region east of India.
 - The Andaman and Nicobar chain of islands could be used as a **basis for Indian maritime power projection into the Indo-Pacific** and even beyond into the south-west Pacific.
 - The A&NI could be used for India's **Third Fleet** (other two are the Western and Eastern Fleets) **and the trans-shipment hub** at Car Nicobar, could potentially be a strategic game-changer, rivalling the ports of Singapore or Colombo.
 - Changing nature of warfare has led to the expansion of scope of a **Tri-Command Service**.

As Andaman and Nicobar is the first Tri-Command structure in India, development of military infrastructure at A&NI is a key requirement in India's security strategy.

- **Increased Maritime Interactions with Quad Countries:**
 - **Quadrilateral Security Dialogue (Quad)** is the **informal strategic** dialogue between **India, USA, Japan and Australia** with a shared objective to ensure and support a “**free, open and prosperous**” **Indo-Pacific region**.
 - There has been a sharp increase in India’s **maritime interactions with the Quad countries** on a bilateral basis centred around information sharing for improved **Maritime Domain Awareness (MDA)** in the **Indian Ocean Region** and **Indo-Pacific**.

MDA is defined by the **International Maritime Organization** as the effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of a country.
 - India has **logistics agreements** with all three Quad countries — **Australia, Japan and the USA**. India has also signed **maritime information sharing agreements** with Australia and Japan and a similar agreement is in the works with the USA .

Way Forward

- The increase in India’s maritime interactions with the Quad countries will **strengthen India’s position in the Indian Ocean Region and Indo-Pacific**.
- **Strategic balancing** is the key to move forward in relationships with powerful countries like the USA.
- India and the USA must now strive to complete **the unfinished agreements** and set the course for a **Comprehensive Strategic Global Partnership**.

Source: TH

2nd Meeting of the Apex Council for Krishna and Godavari River Water Dispute

Why in News

The Centre will determine the jurisdictions of the **Krishna and Godavari river management boards (KRMB and GRMB)**, **Union Jal Shakti Ministry (MoJS)** announced at the **Apex Council Meeting**.

Key Points

- **Apex Council:**
 - It has been constituted by the Central Government under the provisions of **Andhra Pradesh Reorganisation Act (APRA), 2014**.
 - It supervises the functioning of the Godavari River Management Board and Krishna River Management Board.
 - **KRMB & GRMB** are autonomous bodies established as per **APRA-2014** under the administrative control of MoJS to manage and regulate the Waters of Krishna and Godavari Basin respectively in the states of Andhra Pradesh and Telangana.
 - It **comprises the Union Jal Shakti Minister and the Chief Ministers of** Telangana and Andhra Pradesh.
- **Apex Council Meeting:**
 - It was the **second** meeting since **2016**.
 - **Aim:** To resolve the conflict between the two States over executing irrigation projects and sharing water from the Krishna and Godavari rivers.
 - **Highlights of issues discussed:**
 - **Jurisdiction** of the KRMB and GRMB. Even after six years of their formation, their jurisdiction is still not notified because both the states have differing opinions on this issue.
 - Submission of **Detailed Project Reports (DPR)** of new projects in river basins by the two governments for appraisal and sanction by the **Apex Council**.
 - As per the APRA-2014, both KRMB and GRMB should technically appraise and clear them.
 - Establishing a **mechanism** to determine the share of Andhra Pradesh and Telangana in the Krishna and Godavari waters.
 - **Shifting the headquarters** of the Krishna River Management Board to Andhra Pradesh as mandated by APRA-2014.
- **Decisions:**
 - The Centre will go ahead with notifying the jurisdiction of both KRMB & GRMB because as per the **APRA- 2014**, no consensus is needed.
 - Both States agreed to submit the DPRs of all the projects.
 - With regards to sharing of river waters, the Telangana Chief Minister agreed to withdraw the case filed in Supreme Court, to allow the Centre to refer water sharing issues to the **Krishna Godavari tribunal**.

Godavari River

- **Source:** Godavari river rises from Trimbakeshwar near Nasik in Maharashtra and flows for a length of about 1465 km before outfalling into the Bay of Bengal.

- **Drainage Basin:** The Godavari basin extends over states of Maharashtra, Telangana, Andhra Pradesh, Chhattisgarh and Odisha in addition to smaller parts in Madhya Pradesh, Karnataka and Union territory of Puducherry.
- **Tributaries:** Pravara, Purna, Manjra, Penganga, Wardha, Wainganga, Pranhita (combined flow of Wainganga, Penganga, Wardha), Indravati, Maner and the Sabri.

Krishna River

- **Source:** It originates near Mahabaleshwar (Satara) in Maharashtra. It is the second biggest river in peninsular India after the Godavari River.
- **Drainage:** It runs from four states Maharashtra (303 km), North Karnataka (480 km) and the rest of its 1300 km journey in Telangana and Andhra Pradesh before it empties into the Bay of Bengal.
- **Tributaries:** Tungabhadra, Mallaprabha, Koyna, Bhima, Ghataprabha, Yerla, Warna, Dindi, Musi and Dudhganga.

Inter-State River Water Disputes

- **Article 262** of the Constitution provides for the adjudication of **inter-state water disputes**.
 - Under this, Parliament may by law provide for the adjudication of any dispute or complaint with respect to the use, distribution and control of waters of any inter-state river and river valley.
 - Parliament may also provide that neither the Supreme Court nor any other court is to exercise jurisdiction in respect of any such dispute or complaint.
- The Parliament has enacted the two laws, the **River Boards Act (1956)** and the **Inter-State Water Disputes Act (1956)**.
 - The **River Boards Act** provides for the **establishment of river boards** by the Central government for the regulation and development of inter-state river and river valleys.
 - A River Board is established on the request of state governments concerned to advise them.
 - The **Inter-State Water Disputes Act** empowers the Central government to set up an ad hoc tribunal for the adjudication of a dispute between two or more states in relation to the waters of an inter-state river or river valley.
 - The decision of the tribunal is final and binding on the parties to the dispute.
 - Neither the Supreme Court nor any other court is to have jurisdiction in respect of any water dispute which may be referred to such a tribunal under this Act.

Source: PIB

Session on Precision Agriculture

Why in News

Recently, a session on “**Sensors and Sensing for Precision Agriculture**” was organised by the **Indian Council of Agricultural Research-Indian Agricultural Research Institute** (ICAR-IARI).

Precision Agriculture

- Precision agriculture (PA) is an **approach where inputs are utilised in precise amounts to get increased average yields**, compared to traditional cultivation techniques such as **agroforestry, intercropping**, crop rotation, etc.
- Sustainable PA is this century’s most valuable innovation in farm management that is based on using **Information and Communication Technologies (ICTs)**.
- It is **based on sustainable agriculture and healthy food production** and it consists of profitability and increasing production, economic efficiency and the reduction of side effects on the environment.
- **Benefits:**
 - Increases agriculture productivity.
 - Prevents soil degradation.
 - Reduces chemical application in crop production.
 - Efficient use of water resources.
 - Disseminates modern farm practices to improve the quality, quantity and reduced cost of production.
 - Changes the socio-economic status of farmers.
- **Challenges:**

Research suggests **educational and economic challenges** as the two most important in the application of precision agriculture.

 - Among the **variables that contribute to educational challenges**, lack of local experts, funds, knowledgeable research and extension personnel have more of an impact compared to others.
 - PA and initial costs have more of an impact among the **economic challenges** compared to the other issues.

Key Points

- **Discussions at the Session:** Recent **advances in the field of sensors, remote sensing, deep learning, artificial intelligence and Internet of Things (IoT) for monitoring and quantification** of soil, plant and environment to enhance farm productivity with increased input use efficiency and environmental **sustainability**.

- **Part of VAIBHAV Summit:** The session is a part of the **Vaishwik Bhartiya Vaigyanik (VAIBHAV) Summit 2020.**

VAIBHAV is a **Government of India initiative** to bring together the thought process, practices, research and development (R&D) culture of overseas and Indian scientists/academicians.

- **Research Gaps Identified:**

- **Development of indigenous low-cost sensors** with integrated platforms, robotics, IoT for high throughput field phenotyping and soil and crop health monitoring and management.

Phenotyping is the process of determining, analysing or predicting all or part of an organism's phenotype (observable physical properties of an organism).

- **Big data analytics and modelling** for sensor-based early detection of stresses, discrimination in the agriculture sector.
- **Standardized protocols for Unmanned Aerial Vehicle (UAV)** based imaging using different sensors, inter sensor calibration and data analytics for near real-time crop condition monitoring and management.
- **Development of affordable scale neutral precision agricultural technologies** suitable to the ecosystem of Indian agriculture.

Scale neutrality means, if other things remain the same, one small plot of land gives the same proportion of output as a large land holding.

Way Forward

- Keeping in view the research gaps, a specific objective-driven collaboration needs to be proposed.
- More R&D in the field and on the concept is needed. For that, collaborations with global universities can be done for further excelling in education and research and capacity building.

Source: PIB

NCERT Books in Indian Sign Language

Why in News

The **Indian Sign Language Research and Training Centre (ISLRTC)** and the **National Council of Educational Research and Training (NCERT)** signed a memorandum of understanding (MoU) to make NCERT textbooks accessible to hearing-impaired students in sign language.

Key Points

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- **About the MoU:** NCERT textbooks, teachers' handbooks and other materials for Class I-XII of all subjects in Hindi and English medium would be converted into Indian Sign Language (ISL) in digital format.
 - **Significance:**
 - It is a step towards fulfilling needs of **Rights of Persons with Disabilities (RPWD) Act, 2016** and **New Education Policy, 2020**.
 - Signing of this MoU is based on the United Nations Children's Fund - **UNICEF's** initiative "**Accessible Digital Textbooks for All**".
 - So far, hearing impaired children used to study only through verbal or written medium now they can study through **Indian Sign Language which is the same all over the country**.
 - In the **childhood days**, cognitive skills of children are developed and it is very necessary to **provide them educational material as per their learning needs**.

It will not only enhance their vocabulary but also enhance their capabilities to understand concepts.
 - **Indian Sign Language (ISL):**
 - Broadly, it's a **set of hand and facial gestures** used to communicate, most often by the hearing and speech impaired.
 - It has its own grammar, syntax and regional "dialects", essentially different gestures for the same word or sentiment.
 - The **main difference from spoken languages** lies in form: Sign languages are visual, spoken ones are auditory.

Sign language is recognized **as an official language** in many countries across the world like the USA.

Hearing Impairment in India

- **Statistics:**
 - According to the **World Health Organization (WHO)** in 2018, the prevalence of hearing impairment (HI) in India is around **6.3%** (63 million people suffering from significant auditory loss).

The estimated prevalence of **adult-onset deafness** in India is 7.6% and childhood-onset deafness is 2%.
 - The larger percentage of Indian population also suffers from milder degrees of hearing loss and unilateral (one sided) hearing loss.
 - **Nearly 50% of deafness can be prevented** if primary health-care approach is adopted for otological care (care of ear and its diseases) across the world.

- **Initiative for Prevention:**

- **National Program for Prevention and Control of Deafness (NPPCD):**

- It was launched in 2006 in an effort to tackle the high incidence of deafness in the country, in view of the preventable nature of this disability.

- **Funding Pattern:**

- **60:40** for all states except for the North Eastern and Himalayan States (90:10).
 - In case of Union Territories, Central funding is 100% for all UTs except the UTs with legislature, where this ratio is 60:40.

- **Objectives** of the Program:

- To prevent the avoidable hearing loss on account of disease or injury.
 - Early identification, diagnosis and treatment of ear problems responsible for hearing loss and deafness.
 - To medically rehabilitate persons of all age groups, suffering with deafness.
 - To develop institutional capacity for ear care services by providing support for equipment and material and training personnel.

- **Other initiatives:**

- **Accessibility of news and educational videos** with the incorporation of sign language/or written text subtitles and transcripts.
 - **Rights of Persons with Disabilities (RPWD) Act, 2016:** Includes provisions for hearing impaired people.
 - **New Education Policy, 2020: Universalization of education** (including disabled) from preschool to secondary level with **100%** Gross Enrolment Ratio (GER) in school education by **2030**.

Indian Sign Language Research and Training Centre

- **ISLRTC** is an **autonomous** national institute of Department of Empowerment of Persons with Disabilities (DEPwD), **Ministry of Social Justice and Empowerment**.
- It was established in **2015**.
- It is dedicated to the task of developing man-power for popularizing the use of Indian Sign Language, teaching and conducting research in Indian Sign Language.

NCERT:

- It is an **autonomous** organization under the **Ministry of Education (MoE)** which is responsible for:
 - Ensuring qualitative improvement in school education by **undertaking and promoting research** in areas related to school education.
 - Prepare and publish model textbooks, supplementary material.
 - Develop and disseminate innovative educational techniques and practices.
- Act as a **nodal agency** for achieving the goals of **Universalization of Elementary Education**.

Source: PIB

National Startup Awards 2020

Why in News

The **results of the first edition of National Startup Awards (2020)** were recently released by the **Ministry of Commerce & Industry**.

The **Startup India Showcase and Blockchain-based Certificate Verification System** were also launched during the event.

Key Points

- **About the Startup Awards:**
 - **Designed by:** Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry.
 - **Aim:** To **recognize and reward outstanding Startups and ecosystem enablers** that are building innovative products or solutions and scalable enterprises, with high potential of **employment generation or wealth creation**, demonstrating measurable **social impact**.
 - **12 Sectors:** The Awards invited applications across 12 sectors, which are Agriculture, Education, Enterprise Technology, Energy, Finance, Food, Health, **Industry 4.0**, Space, Security, Tourism and Urban Services.
 - Apart from these, startups were selected from those which create impact in **rural** areas, are **women-led** and founded in **academic campuses** (3 special categories).
 - **Prize:** The **winning startup founders** will get a cash prize of Rs. 5 lakh and an opportunity to present their solutions to relevant public authorities and corporates. **Incubators and accelerators** will get Rs. 15 lakh as the winning amount.
 - A **total of 38 startups were awarded**, one in each of the 35 categories and 3 special categories in the 12 sectors.

- **Startup India Showcase:**

- It is part of the **Startup India** portal intended to be an online discovery platform for the most promising startups of the country.

The Government of India has initiated the Startup India Scheme in 2016.

- The **startups showcased here shall be handpicked by experts** and will span across different sectors like **FinTech**, EdTech, Social Impact among others.
- The showcase will **help industry, investors and public authorities find and connect with startups** for potential partnerships, investments and public procurement respectively.

- **Blockchain-based Certificate Verification System:**

- It will enable instant verification and access to certificates of recognitions issued by DPIIT.
- This feature introduces an added layer of **security to the startup certificates**.
- It can be accessed by Government Departments, procurement entities, investors, and other third parties to verify status of recognized startups for accessing different opportunities.

- **Other Related News:**

- Recently, DPIIT also released the results of the 2nd edition of **Ranking of States on Support to Startup Ecosystem** in which Gujarat performed best among all States.
- DPIIT has also released the **Ease of Doing Business Rankings of the States-2019** in which Andhra Pradesh topped.
- Recently, the Parliamentary Standing Committee on Finance tabled a **report related to startups** in Parliament.

Way forward

- The awards will generate excitement and enthusiasm among the young entrepreneurs in taking their innovative ideas to the higher levels and propel the startups to expand and serve new geographies and large numbers of people.
- This will help in generation of employment and achieving the goal of **Atmanirbhat Bharat** (Self Reliant India).

Source :PIB

Nobel Prize for Physics 2020

Why in News

The **Nobel Prize in Physics** for the year 2020 was awarded to three astrophysicists

Roger Penrose from the UK, Reinhard Genzel from Germany, and Andrea Ghez from the USA.

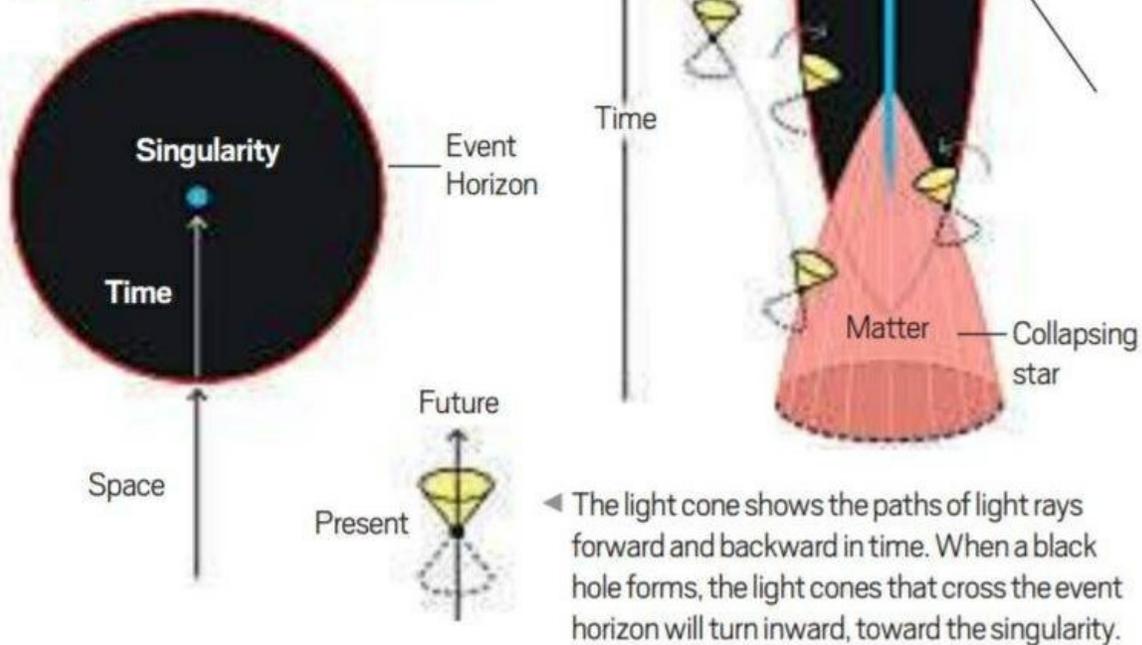
Key Points

- Roger Penrose received **half of this year's prize** for the discovery that a **black hole** formation is a **robust prediction of the general theory of relativity**.
 - Black holes were one of the first and most extreme predictions of Einstein's General Theory of Relativity which came in 1915.
 - The theory explains gravity, as objects try to follow a straight line through a universe whose geometry is warped by matter and energy. As a result, planets, as well as light beams, follow curving paths.
 - Dr Penrose proved that if too much mass accumulated in too small a place, **collapse into a black hole was inevitable**. At the boundary of a black hole, called the event horizon, one would have to go faster than the speed of light to escape it, which is impossible. At the centre of a black hole, where the density became infinite, the laws of physics, would no longer apply.
- **Genzel and Ghez received the second half** of the prize for the **discovery of a supermassive black hole at the centre of the Milkyway galaxy**, now known to be the **Sagittarius A***.
 - It has a mass four million times that of the Sun and is confined to an area roughly the size of our Solar System.
 - In 2019, scientists got the **first optical image of a black hole** which is at the centre of the Messier 87 galaxy.
 - Sagittarius A* is the second black hole whose photographs have been captured by the **Event Horizon Telescope project**. It is yet to be released.
- Dr. Ghez is only the **fourth woman to win the Nobel Prize in Physics**, following Marie Curie in 1903, Maria Goeppert Mayer in 1963 and Donna Strickland in 2018.
- **Other News:** Americans Harvey J Alter and Charles M Rice, and British scientist Michael Houghton were awarded the **Nobel Prize for Medicine or Physiology, 2020** for the discovery of the Hepatitis C Virus.

BLACK HOLES & SINGULARITY

CROSS SECTION OF A BLACK HOLE

When a massive star collapses under its own gravity, it forms a black hole that captures everything passing its event horizon. Not even light can escape. At the event horizon, time replaces space and points only forward. The flow of time carries everything towards a singularity inside black hole, where time ends.



Source: TH

Temporary Shelters for Migratory Birds: Sambhar Lake

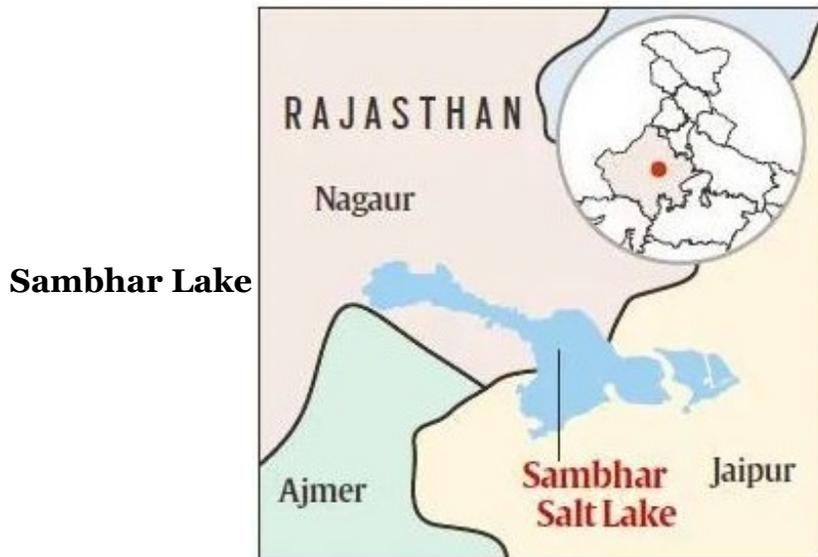
Why in News

Recently, the **Rajasthan government** has decided to **build temporary shelters for migratory birds** near the **Sambhar Lake** (near Jaipur) before 2020's winter season.

Key Points

- Every year, a large number of birds **from the cold northern regions of Central Asia** come to Sambhar Lake.
- In **2019**, **more than 20,000 migratory birds** died due to **avian botulism** in the lake.

- Rajasthan High Court **took suo motu cognisance** of the mass death and asked the expert committee to carry out an **investigation** and make recommendations.
- The Court has constituted a **seven-member expert committee to study the impact of salt-forming and identify any illegal salt mining** in the lake.
- It has suggested the state government seek **the centre's support for more funds** for creating an infrastructure for the **safety and security of birds**.



- It is **India's largest inland saline water body** located near **Jaipur in Rajasthan**.
- It is surrounded on all sides by the **Aravali hills**.
- It is the **source of most of Rajasthan's salt production**.
- Sambhar has been designated as a **Ramsar site** (recognised wetland of international importance) because the **wetland** is a **key wintering area for tens of thousands of flamingos and other migratory birds**.

Avian Botulism

- It is a **neuro-muscular illness** caused by **Botulinum** (natural toxin) that is produced by bacteria, ***Clostridium botulinum***.
 - The bacteria is commonly found in the **soil, rivers, and seawater**. It affects both **humans and animals**.
 - The bacteria also **need anaerobic** (absence of oxygen) **conditions and do not grow in acidic conditions**.
- The illness **affects the nervous system of birds**, leading to **paralysis** in their legs and wings.
- The outbreaks of avian botulism **tend to occur when average temperatures are above 21 degrees celsius, and during droughts**.

Source: TH

