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International Thermonuclear Experimental Reactor (ITER) Assembly

Why in News

Recently, the International Thermonuclear Experimental Reactor (ITER) celebrated the start of **Assembly of the ITER Tokamak at Saint-Paul-Lez-Durance, France.**

Key Points

- **Significance of the Event:**

- The Celebration was hosted **virtually** by the French President and **all ITER member** countries **participated** either in person, or electronically through remote mode.
- India also participated in the celebrations and considered the **global participation of scientists** to project as a perfect illustration of the age-old Indian belief - **Vasudhaiva Kutumbakam.**

Vasudhaiva Kutumbakam is a Sanskrit phrase which means **‘The World is One Family’.**

- **India's Contribution:**

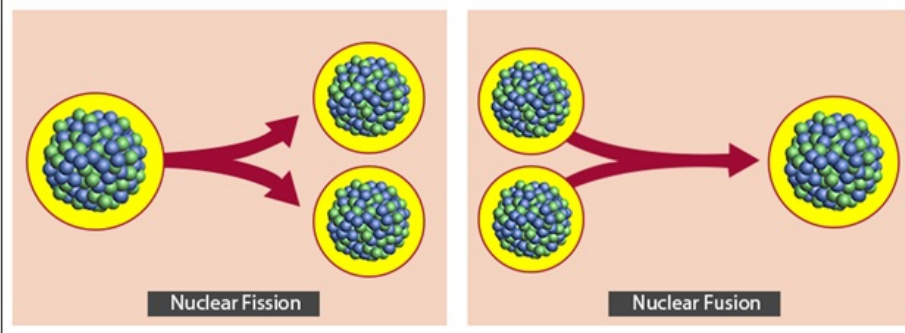
- India also mentioned about its fair share in terms of its in-kind contributions, viz., the cryostat, cryogenic and cryo-distribution systems, auxiliary heating devices, multi megawatt power supplies, etc.
- ITER cryostat is manufactured by **India (Larsen and Tourbo)**. Cryostat is a chamber that can maintain **very low temperatures**.
 - It is the largest stainless steel high-vacuum pressure chamber ever built (16,000 m³) providing the high vacuum, ultra cool environment for the ITER vacuum vessel and the superconducting magnets.
 - The target for the **first plasma is 2025**. At extreme temperatures, electrons are separated from nuclei and a gas becomes a plasma—**an ionized state of matter similar to a gas**.
- **European Union (EU)** is responsible for the **largest portion of construction costs** (45.6%); the remainder is **shared equally** by China, Japan, South Korea, Russia, USA including **India (9.1% each)**.

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.

Difference Between Nuclear Fission and Nuclear Fusion



- **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.

International Thermonuclear Experimental Reactor

- **Establishment:**

- 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.

- **Applicable Principle:**

The project is based on **fusion** which is also an **energy source** for the **Sun and stars**.

Every fusion reaction in the Sun, in which two hydrogen atoms fuse into one helium atom, releases two **neutrinos**.

- **Significance:**

ITER will be the **first fusion device** to maintain **fusion for long periods** of time and also **to test the integrated technologies**, materials, and physics regimes necessary for the commercial production of fusion-based electricity.

- **Participation:**

- The ITER members include **China, the European Union, India, Japan, South Korea, Russia and the United States**.
- According to the **ITER Agreement (2006)**, the above mentioned seven members will share the cost of project construction, operation and decommissioning.
- They also share the experimental results and any intellectual property generated by the fabrication, construction and operation phases.

Source:PIB

CHRI Report on Slavery

Why in News

Recently, the **Commonwealth Human Rights Initiative (CHRI)** and **Walk Free** (an international anti-slavery organisation) released a **report on slavery** on the occasion of **World Day Against Trafficking in Persons (30th July)**.

Key Points

- **The Report:**
 - It **assessed the progress made by Commonwealth countries** on the promises made in 2018 **to end modern slavery by 2030** and achieve the **Sustainable Development Goal (Target 8.7) of ending forced labour, human trafficking and child labour.**
 - Commonwealth countries **accounts for about 40% of people living in conditions of modern slavery in the world.**
 - It is estimated that 1 in every 150 people in the Commonwealth countries live in conditions of modern slavery.
 - It found that Commonwealth countries have made little progress **towards their commitment to eradicate modern slavery** and have been **lacking in actions** to eradicate the modern slavery **by 2030.**
 - One-third of the Commonwealth countries had criminalised forced marriage, while 23 had not criminalised commercial sexual exploitation of children.
 - All Commonwealth countries report gaps in victim assistance programs.
- **India Specific Outcome:**
 - **India had fared the worst in terms of coordination. It has no national coordinating body or National Action Plan** in place to deal with modern day slavery.
 - India accounted for **one-third of all child brides** in the world.
 - India, like all other Commonwealth countries in Asia, had not ratified the **International Labour Organisation's 2011 Domestic Workers Convention** or the 2014 **Forced Labour Protocol.**
 - The 2014 Forced Labour Protocol obligates state parties to provide protection and appropriate remedies, including compensation, to victims of forced labour and to sanction the perpetrators of forced labour.
 - It also obligates state parties to develop a national policy and plan of action for the effective and sustained suppression of forced or compulsory labour.

Steps Taken by India

- **Constitutional Provisions:**

- **Article 21** deals with the Right to Life and Personal Liberty.
- **Article 23** of the Constitution **prohibits** forced labour.
- **Article 24 prohibits** the employment of children (below the age of fourteen years) in factories, etc.
- **Article 39** directs the State to secure the health and strength of workers, men and women, and to see the tender age of children are not abused and that citizens are not forced by economic necessity to enter avocations unsuited to their age or strength.
- **Article 42** directs the State to make provision for securing just and humane conditions of work and for maternity relief.

- **Legal Provision:**

- Various sections in **Indian Penal Code (IPC)** such as **366A, 366B, 370 and 374.**

Section 370 and 370A of Indian Penal Code (IPC) provide for comprehensive measures to counter the menace of human trafficking including trafficking of children for exploitation in any form including physical exploitation or any form of sexual exploitation, slavery, servitude, or the forced removal of organs.

- The **Juvenile Justice Act, 2015** and the **Information Technology (IT) Act, 2000** and also the **Immoral Traffic Act, Prevention of Child Labour Act 1956**, the **Bonded Labour (Abolition) Act 1976**, among others aims to eradicate various forms of slavery.

- **Other Initiatives:**

- India has **ratified the United Nations Convention on Transnational Organised Crime (UNTOC)** which among others has a Protocol to Prevent, Suppress and Punish Trafficking in Persons, especially Women and Children.
- India has **ratified the South Asian Association for Regional Cooperation (SAARC) Convention on Preventing and Combating Trafficking** in Women and Children for Prostitution.
- **A Memorandum of Understanding (MoU) between India and Bangladesh** has been signed on bilateral Cooperation for Prevention of Human Trafficking in Women and Children, Rescue, Recovery, Repatriation and Re-integration of Victims of Trafficking was signed in June, 2015.
- **Anti-Trafficking Nodal Cell** was set up in the Ministry of Home Affairs (MHA) in 2006 to act as a focal point for communicating various decisions and follow up on action taken by the State Governments to combat the crime of Human Trafficking.
- **Judicial Conferences:** In order to train and sensitize the trial court judicial officers, Judicial conferences on human trafficking are held at the High court level. The aim is to **sensitize the judicial officers** about the various issues concerning human trafficking and to ensure speedy court process.
- To enhance the capacity building of law enforcement agencies and generate awareness among them, various **Training of Trainers (TOT) workshops on ‘Combating Trafficking in Human Beings’ for Police officers** and for Prosecutors at Regional level, State level and District level have been organized by the government throughout the country.
- Ministry of Home Affairs under a Comprehensive Scheme **‘Strengthening Law Enforcement Response in India against Trafficking in Persons’** through Training and Capacity Building, has released fund for **establishment of Anti Human Trafficking Units** for 270 districts of the country.
 - The primary role of an **Anti Human Trafficking Unit (AHTU)** is law enforcement and liaising with other concerned agencies for care & rehabilitation of victims.
 - MHA conducts coordination meetings with the Nodal Officers of Anti Human Trafficking Units nominated in all States/UTs periodically.

Modern Slavery

Modern slavery refers to **situations of exploitation** that a person cannot escape because of threats, violence, coercion, and abuse of power or deception. They may be held in debt bondage on fishing boats, against their will as domestic servants or trapped in brothels.

Commonwealth Human Rights Initiative (CHRI)

- It is an independent, non-partisan, **international non-governmental organisation, headquartered in New Delhi**, working for the practical realisation of human rights across the Commonwealth.
- The Commonwealth is a **voluntary association of 54 independent and equal sovereign states**.
 - It is **one of the world's oldest political associations of states**. Its roots go back to the British Empire when some countries were ruled directly or indirectly by Britain. Some of these countries became self-governing while retaining Britain's monarch as Head of State. They formed the British Commonwealth of Nations.
 - **In 1949, the Commonwealth came into being**. Since then, independent countries from Africa, the Americas, Asia, Europe and the Pacific have joined the Commonwealth.
 - Membership is **based on free and equal voluntary cooperation**. **Rwanda and Mozambique** - have no historical ties to the British Empire.

Source: TH

Dispute Panels Against India: WTO

Why in News

Recently, the **Dispute Settlement Body** (DSB) of the **World Trade Organisation** (WTO) has set up **two dispute settlement panels** targeting import duties imposed by India on a number of **Information and Communication Technology (ICT) products** including mobile phones.

- It was done on the **request of Japan and Taiwan**, taking up the number of panels constituted to examine the same tariff-related issue to three.
- In **June 2020**, the **European Union** (EU) had a panel established against India on the same issue.

Key Points

- The panels would determine whether **India's customs duties on imports of certain ICT products infringe the WTO's norms or not**.

- The panels have been set up to decide on **20% customs duty levied by India** on mobile phones and some other ICT products.
 - India decided to levy **10% customs duty** on these products for the first time in July 2017 which was **increased to 15% in the same year**.
 - These custom duties were **further increased to 20%** despite opposition from a number of WTO members.
 - The EU, USA, China, Singapore, Taiwan, Canada, Japan and Thailand initiated consultations with India on the matter claiming that the move substantially affects them.
- The **goods covered in the complaint** include telephones for cellular networks or for other wireless networks; base stations; machines for the reception, conversion and transmission or regeneration of voice, images or other data, etc.
- **Complainants' Arguments:**
 - Japan and Taiwan said that their **failed consultations with India prompted** them to submit the requests for panels.
 - Japan, Taiwan and the EU have argued that **these products fall within the scope of the relevant tariff lines** for which India has set the **bound rate of 0% for its WTO schedule of commitments**.
 - Bound Rates** are the **legally bound commitments on customs duty rates**, which **act as ceilings** on the tariffs that member governments can set.
 - Once a rate of duty is bound, it may not be raised without compensating** the affected parties
 - They held that India is applying tariffs on ITC goods falling under five **tariff lines** in excess of the 0% bound rate and that for some products, the applied tariff rate was **as high as 20% some times**.
 - Tariff Line** refers to the classification codes of goods, applied by individual countries, that are longer than the 6-digit level of the **Harmonized System (HS)**.
 - HS is a **system of code numbers for identifying products**. The codes are **standard up to six digits**. Beyond that countries can introduce national distinctions for tariffs and many other purposes.

- **India's Stand:**

- India managed to **block Japan's first request** for a panel on the grounds that the complaint **undermined India's sovereignty**.
- India also **rejected the EU's suggestion of agreeing to one consolidated panel** combining complaints from all three of them and saving time and resources.
- India argued that all **three complainants are seeking to get the country to take on commitments under the Information Technology Agreement-II (ITA-II) which it never agreed to.**

Information Technology Agreement

- It is a **plurilateral agreement** enforced by the WTO and concluded by **29 participants** in the **Ministerial Declaration on Trade in Information Technology Products at Singapore in 1996**.
- It entered into force on **1st July 1997**.
- It seeks to **accelerate and deepen the reduction of trade barriers** for the critically important ICT industry.
- Currently, the number of participants has grown to 82, representing about 97% of world trade in IT products.
- **India is a signatory.**

Information Technology Agreement-II

- Few developed countries **proposed to broaden the scope and coverage of the ITA**.
- At the **Nairobi Ministerial Conference in December 2015**, over 50 members concluded the **expansion of the Agreement**, which now covers an additional 201 products valued at over USD 1.3 trillion per year.
- Its **aim** was to **increase the coverage of IT products** on which customs duty would be bound at zero, **addressing non-tariff measures and expanding the number of signatory countries** to include countries such as Argentina, Brazil and South Africa.
- **India has decided not to participate** in this for the time being because India's experience with the ITA-I has been most discouraging, which almost wiped out the IT industry from India.

The **real gainer** from that agreement has been **China which raised its global market share from 2% to 14% between 2000-2011**. China is a **significant exporter of ICT goods**.

Source: BL

AIM-iCREST: NITI Aayog

Why in News

Recently, the **Atal Innovation Mission (AIM)** has launched an incubator capabilities enhancement program '**AIM-iCREST**'.

Atal Innovation Mission (AIM) is a **flagship initiative set up by the NITI Aayog** to promote a culture of innovation and entrepreneurship in the country.

Key Points

- AIM-iCREST is an **Incubator Capabilities Enhancement program for a Robust Ecosystem** focused on **creating high performing Startups**.
- It has been designed to act as a **growth support for AIM's Atal and Established Incubators** across the country.

For the same, AIM has joined hands with Bill & Melinda Gates Foundation and Wadhvani Foundation - organizations that can lend credible support and expertise in the entrepreneurship and innovation space.

- The **AIM's incubators are set to be upscaled and provided requisite support** to foster the incubation enterprise economy, that will help them to significantly enhance their performance.
 - This will be complemented by **providing training to entrepreneurs**, through technology driven processes and platforms.
 - The focus will be on **supporting start-up entrepreneurs in knowledge creation and dissemination** as well as in developing robust and active networks.

- **AIM's Atal and Established Incubators:**
 - **Business incubators** are institutions that **support entrepreneurs in developing their businesses**, especially in initial stages.

Incubation is usually done by institutions which have experience in the business and technology world.
 - **Atal Incubation Centres:**

AIM intends to support the establishment of new incubation centres called **Atal Incubation Centres (AICs)** that would nurture innovative start-ups in their pursuit to become scalable and sustainable business enterprises.
 - **Established Incubation Centres:**
 - In recent years, academia, industry, investors, small and big entrepreneurs, government organizations, and non-governmental organizations have taken an initiative to set up incubation centres across the country.
 - AIM envisages to **upgrade these Established Incubation Centres (EICs) to world-class standards.**

Atal Innovation Mission

- AIM is Government of India's flagship initiative to promote a culture of innovation and entrepreneurship in the country.
- It's **objective** is to develop new programmes and policies for fostering innovation in different sectors of the economy, provide platform and collaboration opportunities for different stakeholders, create awareness and create an umbrella structure to oversee the innovation ecosystem of the country.
- **Major Initiatives:**
 - **Atal Tinkering Labs:** Creating problem solving mindset across **schools in India.**
 - **Atal Incubation Centers:** Fostering world class startups and adding a new dimension to the incubator model.
 - **Atal New India Challenges:** Fostering product innovations and aligning them to the needs of various sectors/ministries.
 - **Mentor India Campaign:** A national mentor network in collaboration with the public sector, corporates and institutions, to support all the initiatives of the mission.
 - **Atal Community Innovation Center:** To stimulate community centric innovation and ideas in the **unserved /underserved regions of the country** including Tier 2 and Tier 3 cities.
 - **Atal Research and Innovation for Small Enterprises (ARISE):** To stimulate innovation and research in the MSME industry.



Source: PIB

Hiroshima Black Rain

Why in News

Recently, a **district court of Hiroshima (Japan)** has recognised 84 survivors of the post-nuclear explosion “black rain” as the atomic bomb survivors enabling them to avail benefits like free medical care.

Key Points

- **Nuclear Explosion:**
 - In **1945**, the **USA dropped the atomic bombs on Hiroshima and Nagasaki on 6th and 9th August respectively**, which marked the end of **World War II**.
2020 marks the 75th anniversary of the incident.
 - The explosion and resultant firestorms are believed to have killed around 80,000 people in Hiroshima and around 40,000 people in Nagasaki.
 - Thousands more died in the following years due to the exposure to radiation from the blast and also from the black rain that fell in the aftermath of the explosions.

- **Black Rain:**

- The **debris and soot from the destroyed buildings in Hiroshima** (estimated 69% of the buildings was destroyed) **mixed with the radioactive fallout** from the bomb, rose high into the atmosphere in the form of a mushroom cloud.
- This **material combined with the vapour** in the atmosphere and **came down as dark drops of liquid** that have been called black rain.
- Survivors describe it as consisting of **large, greasy drops that are much heavier than normal raindrops.**
- **Nagasaki witnessed less black rain** despite the fact that the nuclear bomb dropped on it was more powerful than Hiroshima's.
 - It killed fewer people and its effects were confined to a smaller area because of **Nagasaki's geographical position between hills.**
 - The blast **did not produce firestorms** and the **material contributing to black rain was less.**

- **Effects:**

- Black rain is full of **highly radioactive material** and exposure to it can result in serious illnesses.
- A study conducted in 1945 showed that black rain had come down **as far as 29 km** away from **ground zero.**
 - In relation to nuclear explosions and other large bombs, **ground zero is the point on the Earth's surface closest to a detonation.**
 - In the case of an explosion above the ground, ground zero is the **point on the ground directly below the nuclear detonation** and is sometimes called the **hypocenter.**
- The rain **contaminated everything it came in contact with.** **Dead fish** were reported floating in water bodies and **severely ill cattle** were seen lying in the fields.
- Black rain caused **Acute Radiation Symptoms (ARS)** in many who were exposed to it.

These symptoms include **nausea, diarrhoea, fever, sore throat and loss of hair.**
- Over time, many people who were exposed to black rain have **developed cancer** as well.

- **Addition to Survivors:**
 - In **1976, Japan used a 1945 study to demarcate the area within which people could claim to have been affected** by black rain and be recognised as survivors of the nuclear blast.
 - It allowed people living in the area during the time of the black rain to **avail free medical care and other benefits** if they showed symptoms related to radiation exposure.
 - However, later studies have shown that **black rain could have come down on an area nearly four times the size of the one demarcated** by the government.
 - It was also argued that **people who moved to the area later, could also be affected** by the radioactive contamination caused by the rain.
- **Effects of the Ruling:**
 - The Hiroshima District Court ruling **recognises the plaintiffs as Hibakusha (Japanese term for the survivors of the nuclear blasts).**
 - It gives **hope to many others** because the decision **may pave the way for the government to reconsider the limits** it has set on who can be considered a survivor of the atomic bomb.

Source: IE

Tourism in Uttarakhand's Border Villages

Why in News

Recently, the Central government has decided to **boost tourism in Uttarakhand villages that border China.**

Uttarakhand **shares a 350-km border** with China.

Key Points

- In the backdrop of the **Galwan Valley standoff**, the Centre is planning to build a **second line of defence** in border villages of Uttarakhand by relaxing tourism-related activities.
- The Central government wants to make India's border villages safe, for which it has mooted the concept of **tribal tourism.**
- The first step in the direction will be to free some parts of Uttarakhand from the **Inner Line Permit (ILP) system.**

- Once the ILP system is lifted, the state tourism department would **encourage houses in the villages to be developed as homestays** which will directly help the village economy.

Visitors in border villages would also get to taste **tribal cuisine**.

- The Uttarakhand government has also announced steps to improve critical infrastructure, promote tourism and civilian settlements in the border areas of the state.

Benefits:

- It will **ensure safety and surveillance of border villages** and troops will get additional support.
- It will **boost the economy** of bordering villages **and provide employment**.
- It will also **stop outward migration**.

Most of the border villages see outward migration owing to a lack of livelihood opportunities.

Source: IE

PLpro: Covid-19

Why in News

According to a new study on **Covid-19**, pharmacological **inhibition of PLpro blocks virus replication** and also **strengthens immune response** in humans.

Key Points

- Usually, when a virus attacks human cells, the **infected body cells release messenger substances known as ‘type 1 interferons’** which **attract the killer cells** in human bodies. These killer cells **kill the infected cells and save humans** from getting sick.
- When the **novel coronavirus (SARS-CoV-2)** enters a human cell, it hijacks the cell mechanism and **fights back by letting the human cell produce PLpro**.
 - **PLpro is a protein** which **suppresses the development of type 1 interferons**. Due to which, **killer cells are not informed** about the infection.
 - Hence, **PL pro plays a crucial role in the replication** of the virus.

- **Significance of the Research:**
 - Researchers can now monitor these processes in a cell culture (artificial environment).
 - By **blocking PLpro, virus production can be controlled.**
 - In the **absence** of the PLpro, **type 1 interferons will be released** informing the killer cells and thus, **strengthening the innate immune response** of the human cells.

Source: IE

AJO-Neo : Device to Measure Neonatal Bilirubin Level

Why in News

Recently, researchers from the S.N. Bose National Centre For Basic Sciences (SNBNCBS), Kolkata have developed a device called “**AJO-Neo ” to measure neonatal bilirubin level.**

SNBNCBS is an **autonomous research Institute** under the **Department of Science and Technology (DST)**, Government of India.

Key Points

- **Description:**
 - AJO-Neo is a **non-contact and non-invasive spectrometry-based technique** for measurement of neonatal bilirubin level **without limitations** of other available bilirubin meters.
 - Bilirubin is a **yellowish substance** in the blood. It forms after **red blood cells break down**, and it travels through liver, gallbladder, and digestive tract before being excreted.
 - It is a necessary process in the **body's clearance of waste products** that arise from the destruction of aged or abnormal red blood cells.
- **Significance:**
 - The screening of bilirubin level in new-borns is necessary to **reduce incidents of a type of brain damage called kernicterus** that can result from high levels of bilirubin in a baby's blood.
 - Kernicterus leads to **Neuro-psychiatry problems** in neonates.

- **Advantages:**

- It is reliable in measuring bilirubin levels in **preterm, and term neonates** irrespective of gestational or postnatal age, sex, risk factors, feeding behavior or skin color.
- The device delivers an **instantaneous report (about 10 seconds)** to a concerned doctor.

The **conventional “blood test”** method takes **more than 4 hours** to generate the report.

Source: PIB

Subhash Chandra Bose Aapda Prabandhan Puraskar

Why in News

The Government of India has invited nominations for the ‘**Subhash Chandra Bose Aapda Prabandhan Puraskar**’.

Applications for the year 2021 would be accepted till 31st August 2020.

Key Points

- **Field Recognised:** The Government of India instituted **Subhash Chandra Bose Aapda Prabandhan Puraskaar** to recognise the excellent work done by the individuals and institutions in the field of **disaster management**.
- **Administered By:** **National Disaster Management Authority** (NDMA - created by the Ministry of Home Affairs under the Disaster Management Act, 2005).
- **Award:**
 - The **awards are announced on the birth anniversary of Netaji Subhash Chandra Bose on 23rd January every year.**
 - In addition to a certificate, these awards carry a **cash award of Rs. 51 lakhs for an Institution** and **Rs. 5 lakhs for an Individual.**

The Institution has to utilize the cash prize for Disaster Management related activities only.
- **Eligibility:**
 - **Only Indian nationals and Indian institutions** can apply for the award.
 - The nominated individual or institution should have **worked in any area of disaster management** like Prevention, Mitigation, Preparedness, Rescue, Response, Relief, Rehabilitation, Research, Innovation or early warning in India.

Source: PIB

