

# My Notes....

## NATIONAL

### SDG GENDER INDEX

A new index to measure global gender equality, launched on 3 June 2019, ranks India at 95th among 129 countries. The **SDG Gender Index** comes close on the heels of the **gender gap index** of the World Economic Forum where **India was ranked 108th**.

#### How the ranking works

- The **SDG Gender Index** has been developed by **Equal Measures 2030**, a joint effort of regional and global organisations including African Women's Development and Communication Network, Asian-Pacific Resource and Research Centre for Women, Bill and Melinda Gates Foundation, and International Women's Health Coalition.
- It accounts for **14 out of 17 SDGs (sustainable development goals)** that cover aspects such as poverty, health, education, literacy, political representation and equality at the workplace.
- A score of 100 reflects the achievement of gender equality in relation to the targets set for each indicator.
- It means, for example, that **100% of girls** complete secondary education, or that there is around 50-50 parity for women and men in Parliament. A score of 50 signifies that a country is about halfway to meeting a goal.
- The ranking found that the world is far from achieving gender equality with 1.4 billion girls and women living in countries that get a "very poor" grade. **The global average score of the 129 countries** — which represent 95% of the world's girls and women — is **65.7 out of 100 ("poor" in the index)**.
- Altogether, **2.8 billion girls and women live in countries that get either a "very poor"** (59 and below) or "poor" score (60-69) on gender equality.

#### Key findings for India

- India's highest goal scores** are on **health (79.9), hunger & nutrition (76.2), and energy (71.8)**. Its lowest goal scores are on partnerships (18.3, in the bottom 10 countries worldwide), industry, infrastructure and innovation (38.1), and climate (43.4).
- On indicators that define such goals, **India scored 95.3 on the percentage of female students** enrolled in primary education who are overage.
- Some of India's lowest scores on indicators include the proportion of seats held by women in national parliaments (score 23.6; women made up 11.8% of Parliament in 2018). **On seats held by women in the Supreme Court (4%), India has a score of 18.2.**
- On gender-based violence, indicators include proportion of women aged 20-24 years who were married or in a union before age 18 (27.3%), women who agreed that a husband/partner is justified in beating his wife/partner under certain circumstances (47.0%), and women aged 15+ who reported that they "feel safe walking alone at night in the city or area where she lives" (69.1%).

## INDIA IN GPI 2019

India's rank has slipped five places to **141 among 163 countries** on the **Global Peace Index (GPI) 2019**, while **Iceland remains the most peaceful country** and **Afghanistan the least peaceful nation**, says a report. Australian think tank **Institute for Economics & Peace** ranks countries according to their level of peacefulness based on **three thematic domains** -- the level of societal safety and security, the extent of ongoing domestic and international conflict and the degree of militarisation.

### What

1. **Iceland remains the most peaceful country in the world**, a position it has held since 2008. It is joined at the top of the Global Peace Index (GPI) by New Zealand, Austria, Portugal, and Denmark.

2. **Afghanistan is now the least peaceful country in the world, replacing Syria**, which is now the second least peaceful. South Sudan, Yemen, and Iraq comprise the remaining five least peaceful countries.

3. In South Asia, Bhutan topped the index with 15th rank, followed by Sri Lanka 72, Nepal 76 and Bangladesh 101. The neighbouring country Pakistan has been ranked 153rd on the index.

RANK	COUNTRY	SCORE	CHANGE
141	India	2.605	↓ 4
142	Palestine	2.608	↓ 2
143	Colombia	2.661	↑ 2
144	Venezuela	2.671	↓ 2
145	Mali	2.710	↑ 2
146	Israel	2.735	↑ 1
147	Lebanon	2.800	↓ 26
148	Nigeria	2.898	↔
149	North Korea	2.921	↑ 1
150	Ukraine	2.950	↑ 2
151	Sudan	2.995	↑ 3
152	Turkey	3.015	↓ 3
153	Pakistan	3.072	↓ 2
154	Russia	3.093	↓ 1
155	Dem. Rep. of the Congo	3.218	↔
156	Libya	3.285	↑ 1
157	Central African Rep	3.296	↓ 1
158	Somalia	3.300	↑ 1
159	Iraq	3.369	↑ 1
160	Yemen	3.412	↓ 2
161	South Sudan	3.526	↔
162	Syria	3.566	↑ 1
163	Afghanistan	3.574	↓ 1

4. India together with Philippines, Japan, Bangladesh, Myanmar, China, Indonesia, Vietnam and Pakistan are the nine countries with the highest risk of multiple climate hazards. The country has the 7th highest overall natural hazard score, the report's findings said.
5. India, the US, China, Saudi Arabia, and Russia are the top five countries with the largest total military expenditure.
6. According to the report, South Asia's score for every indicator in ongoing conflict is less peaceful than the global average, with four out of six deteriorating last year. Only deaths from internal conflict improved, with fewer fatalities in Pakistan, Afghanistan and India than the year prior.
7. The score for internal conflicts fought had the highest rating at five in both India and Pakistan. China, Bangladesh, and India, score in the bottom half of the GPI and have significant exposure to climate hazards, with 393 million people in high climate hazard areas, the report observed.
8. The global peacefulness improved for the **first time in five years**, as per the index findings, the world remains less peaceful than a decade ago.

9. This year's report includes new research on the possible effects of climate change on peace. Since 2008 global peacefulness has deteriorated by 3.78 per cent, the report revealed.
10. The **GPI was founded by Steve Killelea**, an Australian technology entrepreneur and philanthropist.
11. **The report covers 99.7 per cent of the world's population** and uses 23 qualitative and quantitative indicators from highly respected sources to compile the index.

## NITI AAYOG MEET

In **his first meeting since getting re-elected, Prime Minister Narendra Modi** will discuss issues such as drought situation, farm distress, rain-water harvesting and preparedness for Kharif crops with **NITI Aayog's Governing Council** on 15 June 2019. **The meeting is the fifth, since the first meeting was held on 8 February 2015.**

### What

1. The **fifth meeting also includes special invitees** namely the National Security Adviser, Minister of Consumer Affairs, Food and Public Distribution, Minister of Jal Shakti and the Minister of Animal Husbandry, Dairying and Fisheries, the government statement added.
 

**The meeting would include a 5-point agenda**

  1. **Rain-water harvesting**
  2. **Drought situation and relief measures**
  3. **Aspirational districts programme – achievements and challenges**
  4. **Transforming agriculture:** need for structural reforms with special emphasis On: **agriculture produce marketing committee (APMC) Act** and **Essential Commodities Act (ECA)**
  5. Security related issues with **specific focus on LWE districts.**
2. Meanwhile, the government mandated the NITI Aayog with boosting **cooperative federalism** through structured support initiatives and mechanisms with the States.
3. **In the last meeting on June 17, 2018**, the members had deliberated upon measures taken to double farmers' income and the progress of the government's flagship schemes.

## UNMANNED SCRAMJET DEMONSTRATION AIRCRAFT

**India successfully conducted** the maiden flight test of indigenously developed **unmanned scramjet demonstration aircraft for hypersonic speed flight** from a base off Odisha coast on 12 June 2019. The aircraft forms an important component of the country's ambitious programme for development of a **hypersonic cruise missile system.**

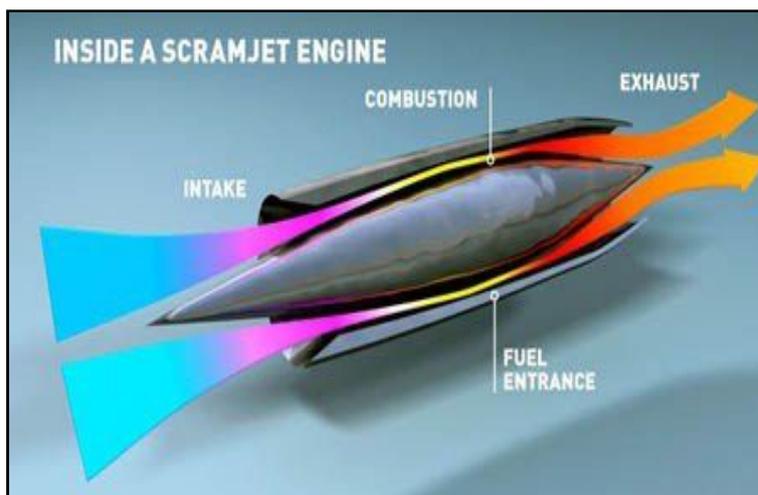
### What

1. **The trial was carried out by the Defence Research and Development Organisation** from **Dr Abdul Kalam Island** in the Bay of Bengal at about 11.25 am.
2. The new technology was tested. Data generated by radars showed that the trial was a success.
3. Developed under a special project, **HSTDV (Hypersonic Technology Demonstrator Vehicle)** is an unmanned scramjet demonstration aircraft for hypersonic speed flight.

4. **Under the HSTDV programme run by the DRDO**, a demonstrator flight vehicle has been conceptualised to demonstrate the Scramjet technology for a short duration of about 20 seconds.

5. Once it is achieved successfully, India will join another select club of countries having such technology.

6. Apart from being used as a vehicle for **hypersonic and long-range cruise**



**missiles**, it is a dual-use technology which will have multiple civilian applications as well. It can also be used for launching satellites at low cost.

## PANEL FOR REVISION OF OROP

Defence minister Rajnath Singh **constituted a committee to work out the modalities and methodology for the next revision of pensions** to the over 25 lakh ex-servicemen and widows under the **OROP (one rank, one) scheme**. The committee, **headed by the Controller General of Defence Accounts (CGDA)** and including representatives from the three services, will submit its report in a month.

### What

1. The move comes in the **backdrop of the CGDA** having asked the department of ex-servicemen

welfare in the MoD to clarify "whether any logic exists to initiate the process of OROP revision once the pension of past and current pensioners was equated with effect from January 1, 2016" during the implementation of the **7th Central Pay Commission**.

2. OROP was implemented by the NDA-I

government with effect from July 1, 2014. The government, however, did not accept

### Salient features of the OROP scheme

1. The **benefit will be given with effect from 1st July, 2014**. The present government assumed office on 26th May, 2014 and therefore, it has been decided to make the scheme effective from a date immediately after.
2. **Arrears will be paid in four half-yearly instalments**. All widows, including war widows, will be paid arrears in one instalment.
3. To begin with, **OROP would be fixed on the basis of calendar year 2013**.
4. Pension will be re-fixed for all pensioners retiring in the same rank and with the same length of service as the average of minimum and maximum pension in 2013. Those drawing pensions above the average will be protected.
5. **Personnel who voluntarily retire will not be covered under the OROP scheme**.
6. In future, the pension would be **re-fixed every 5 years**.

- the case made by veterans for "**pension equalisation or adjustment**" every year, and notified that it will be done only at five-year intervals.
3. The first five-year period ends on July 1, 2019. **OROP basically means payment of uniform pension to personnel retiring in the same rank** with the same length of service, irrespective of their date of retirement.
  4. Some veterans have argued that increase in pensions under the 7th CPC is not 'equalisation' of pension under OROP.
  5. Upward revision of pension due to implementation of the 7th CPC should not be linked to equalization under OROP.
  6. Prime Minister Narendra Modi-led NDA government on July 2018 announced the '**One Rank One Pension**' scheme for ex-servicemen.

## INTERNATIONAL

### ASEAN-LED MECHANISM

**US, India, Australia and Japan** collectively came out in strong support of an **ASEAN-led mechanism** to preserve and promote **rules-based order in the Indo-Pacific region** where China is flexing its muscles. Senior officials of the four countries, at a meeting in Bangkok, also highlighted their efforts to maintain universal respect for international law and freedom of navigation and overflight in the region. Welcoming ASEAN's efforts to **develop an Indo-Pacific outlook**, the four countries affirmed their strong support for **ASEAN centrality** and **ASEAN-led regional architecture**, as well as their support for other regional institutions, including the **Indian Ocean Rim Association** and Pacific Islands Forum.

#### What

1. The **10-nation Association of Southeast Asian Nations (ASEAN)** is considered one of the most influential groupings in the region and India and several other countries including the US, China, Japan and Australia are its dialogue partners.
2. In November 2017, **India, the US, Australia and Japan** gave shape to the **long-pending "Quad" Coalition** to develop a new strategy for keeping the critical sea routes in the Indo-Pacific free of any influence.
3. China has been trying to expand its military presence in the Indo-Pacific, which is a **biogeographic region**, comprising the Indian Ocean and the western and central Pacific Ocean, including the South China Sea.



4. China claims almost all of the South China Sea. Vietnam, the Philippines, Malaysia, Brunei and Taiwan have counter claims over the sea. During the meeting, the four nations reaffirmed their shared commitment to preserve and promote the rules-based order in the region.
5. The four countries underscored their intent to continue regular consultations on **Indo-Pacific engagement** and initiatives together and with other interested nations and institutions.
6. The Quad coalition also discussed initiatives undertaken by each country to encourage transparent, principles-based investment in quality infrastructure in accordance with international standards and leverage the potential of the private sector.
7. The ASEAN comprises Singapore, Brunei, Malaysia, Thailand, the Philippines, Indonesia, Vietnam, Laos, Cambodia and Myanmar.

### INDIA SIGNS DEAL WITH ISRAEL

India signed a deal with Israel under emergency provisions worth around Rs 300 crore for **buying over 100 Spice bombs** with high explosives warhead **for the Indian Air Force**. This is the **first defence deal signed by the government** after Prime Minister Narendra Modi took over for a second term. The bombs to be procured are an **advanced version of the Spice-2000 bomb**, which can be used to reduce enemy buildings and bunkers to rubbles in no time.

#### What

1. **Spice-2000 bombs were used by IAF's Mirage-2000 fighter** jets in the airstrikes on Jaish-e-Mohammad terror camp at Balakot in Pakistan.
2. A contract for procuring over **100 Spice bombs with Mark 84 warheads was signed with Israel** under emergency provisions as per which the deliveries would be done in three months time.
3. During the strikes, the penetrator version of Spice-2000 bombs was used by the IAF in the Balakot airstrikes which made holes in the concrete rooftops of the buildings in the Jaish camp but did not destroy the buildings.
4. The bombs, however, exploded inside the building killing those who were present inside the building.
5. **The IAF is now going to acquire the bunker buster** or the building destroyer version with Mark 84 warhead which can decimate targeted buildings.
6. **Spice bomb has a standoff range of 60 kilometres** and approaches the target as its unique scene-matching algorithm compares the electro-optical image received in real-time via the weapon seeker with mission reference data stored in the weapon computer memory and adjusts the flight path accordingly. Spice 2000 consists of an add-on kit for warheads such as the MK-84, BLU-109, APW and RAP-2000.

### US OFFERS MISSILE DEFENCE SYSTEMS TO INDIA

The **Trump administration has approved the sale of armed drones to India** and has **offered integrated air and missile defence systems** aimed at helping the country boost its military capabilities and protect shared security interests in the **strategically important Indo-Pacific region**. The **approval-cum-offer from the US** came in the aftermath of the February 14 Pulwama terrorist attacks in which 40 Indian soldiers were

killed and the increasing militarisation and assertiveness of China in the Indo-Pacific Ocean.

### What

1. The United States approved the **sale of the armed drones to India**. We have offered integrated air and missile defense technology to India, a senior White House official told.
2. The official, who spoke on the condition of anonymity, did not reveal when the sale of the armed drones to India took place.
3. During the June 2017 meeting between Prime Minister Narendra Modi and President Donald Trump, the US had agreed to sell surveillance version of the Guardian drones to India.
4. **India was the first non-treaty partner to be offered a MTCR Category-1 Unmanned Aerial System** – the Sea Guardian UAS manufactured by General Atomics.
5. Close on the heels of armed drones, which will have **its implications in South Asia and Indo-Pacific region**, the US has also offered its integrated defense missile capabilities to India.
6. While officials are tight-lipped about it, the offer is said to be about two of its latest systems: **Terminal High Altitude Area Defense system (THAAD)**, which is highly effective when used against long-range ballistic missiles and Patriot Missile defense system.
7. **India, which has already signed an agreement with Russia to purchase S-400 missile defense system**, is yet to respond to the American offer. The American offer, which came of its own, is currently being studied in New Delhi.
8. In a fact sheet on “US Security Cooperation with India” issued this week, the State Department joined the White House in trying to help strengthen its defense capabilities mainly due to the Indo-Pacific region.
9. **India plays a vital role in the US vision for a free and open Indo-Pacific**,” said the fact sheet issued by the Bureau of Political Military Affairs of the State Department.
10. Towards this end, in 2016, the US designated India as a Major Defense Partner.
11. Some of the recent top defense sales to India include: **MH-60R Seahawk helicopters (USD 2.6 billion), Apache helicopters (USD 2.3 billion), P-8I maritime patrol aircraft (USD 3 billion)**, and M777 howitzers (USD 737 million).

### TOKAYEV ELECTED KAZAKHSTAN PRESIDENT

**Kazakhstan's interim president Kassym-Jomart Tokayev**, chosen successor of veteran ruler **Nursultan Nazarbayev** who retains sweeping powers, has won a snap presidential election with **nearly 71% of the vote**. Nazarbayev, **who ruled oil producer Kazakhstan for almost three decades**, handpicked the **66-year-old career diplomat** as his successor when he stepped down in March. In a power-sharing arrangement, Nazarbayev, 78, remains chairman of the influential Security Council and lead the ruling Nur Otan party.

### What

1. **With Tokayev's six rivals largely unknown to Kazakh voters**, opponents denounced the election as unfair, prompting public protests despite Kazakhstan's restrictive laws on freedom of expression.
2. The **Kazakh state closely controls domestic politics and public discourse**. The vast majority of local media does not criticise Nazarbayev, and social media and online messaging platforms were restricted during election.
3. Tokayev received congratulations from fellow **Central Asian leaders** such as Uzbek and Kyrgyz presidents. "We must unite to work for the future of Kazakhstan," Tokayev's campaign website quoted him as saying.
4. **Nazarbayev's eldest daughter Dariga became the speaker of the Senate in March**, the post previously held by Tokayev, and members of the ex-president's family control some key business assets such as Kazakhstan's largest bank, Halyk.

## CHINA'S RARE EARTHS EXPORTS FALL

**Rare earth exports by China**, the world's dominant producer, fell 16% in May from a month earlier amid an increased focus on the raw materials due to the **Sino-U.S. trade war**, although the drop was in line with usual trading. Exports by China was the key supplier of a group of **17 chemical elements** used in everything from high-tech consumer electronics to military equipment, swing sharply from month to month, **often by 20 percent or more**.

### What

1. **Rare earth prices** recently hit multi-year highs following a flurry of state media reports that Beijing could use its supply-dominance of the prized minerals in its trade war with Washington.
2. **China is home to at least 85% of the world's capacity** to process rare earth ores into material that manufacturers can use.
3. It supplied 80% of the rare earths imported by the United States from 2014 to 2017.
4. A **rare-earth element (REE) or rare-earth metal (REM)**, as defined by IUPAC, is **one of a set of seventeen chemical elements** in the periodic table, specifically the fifteen lanthanides, as well as scandium and yttrium.
5. **Scandium and yttrium** are considered rare-earth elements because they tend to occur in the same ore deposits as the lanthanides and exhibit similar chemical properties, but have different electronic and magnetic properties.

### Rare earth elements (REE)

Symbol	Name	
	English	Español
<i>Ph.D. Natalia Petrovskaya, 2015</i>		
La	Lanthanum	Lantano
Ce	Cerium	Cerio
Pr	Praseodymium	Praseodimio
Nd	Neodymium	Neodimio
Pm	Promethium	Prometio
Sm	Samarium	Samario
Eu	Europium	Europio
Gd	Gadolinium	Gadolinio
Tb	Terbium	Terbio
Dy	Dysprosium	Disproσιο
Ho	Holmium	Holmio
Er	Erbium	Erbio
Tm	Thulium	Tulio
Yb	Ytterbium	Iterbio
Lu	Lutetium	Lutecio
Sc	Scandium	Escandio
Y	Yttrium	Itrio

6. The **17 rare-earth elements** are **cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).**

## ECONOMY

### RBI NEW NPA FRAMEWORK

**Reserve Bank of India (RBI)** issued a **new framework for resolution of bad loans**, replacing the previous norms quashed by the Supreme Court in April, offering a **30-day gap for stress recognition instead of the one-day default earlier.** The **new norms replaces all the earlier resolution plans** such as the framework for revitalising distressed assets, corporate debt restructuring scheme, flexible structuring of existing long-term project loans, **strategic debt restructuring scheme (SDR)**, change in ownership outside SDR, and **scheme for sustainable structuring of stressed assets (S4A)**, and the joint lenders' forum with immediate effect.

#### What

1. The **apex court on April 2 struck down the stringent RBI circular**, issued on February 12, 2018, for resolving bad loans under which a company could be labelled a Non-performing asset (NPA) if it missed repayment for a day banks were asked to find a resolution within 180 days or else it should be sent to bankruptcy courts.
2. The **new circular provides for a framework for early recognition**, reporting and time-bound resolution of bad loans.
3. The central bank said lenders shall recognise incipient stress in loan accounts, immediately on default, by classifying such assets as **special mention accounts (SMA).**
4. Since default with any lender is a lagging indicator of financial stress faced by the borrower, it is expected that the lenders initiate the process of implementing a resolution plan (RP) even before a default.
5. The central bank said once a borrower is reported to be in default by any lenders, financial institutions, small finance banks or NBFCs, the lenders shall undertake a prima facie review of the **borrower account within 30 days from the day of default.**
6. During this **review period of 30 days**, lenders may decide on the resolution strategy, including the nature of the resolution plan (RP) and the approach for implementation of the RP.
7. In cases where RP is to be implemented, all lenders shall enter into an **inter-creditor agreement [ICA]**, during the review period, to provide for ground rules for finalisation and implementation of the RP in respect of borrowers with credit facilities from more than one lender. The lenders are free to initiate legal proceedings for insolvency or recovery, the central bank said.
8. The **joint lenders' forum (JLF)** as mandatory institutional mechanism for resolution of stressed accounts also stands discontinued. The RBI said the new directions will come into force with immediate effect.

## G20 AGREES WITH DIGITAL TAX

**Group of 20 finance ministers** agreed on 8 June 2019 to push ahead on compiling common rules that will **close loopholes that global technology giants** such as Facebook use to reduce their corporate taxes, a copy of the **bloc's draft communique** obtained by Reuters showed. **Facebook, Google, Amazon, and other large tech companies** have come under criticism for cutting their tax bills by booking profits in low-tax countries regardless of the location of the end customer, practices seen by many as unfair. **The new rules mean higher tax burdens for large multi-national firms**, but will also make it more difficult for countries like Ireland to attract foreign direct investment with the promise of ultra-low corporate tax rates.

### What

1. **Britain and France have been among the most vocal proponents of proposals to tax big tech companies**, which focus on making it more difficult to shift profits to low-tax jurisdictions and on the introduction of a minimum corporate tax.
2. This has put the two countries at loggerheads with the United States, which has expressed concern that U.S. Internet companies are being unfairly targeted in broad push to update the global corporate tax code.
3. **The United States has significant concerns** with the two corporate taxes proposed by **France and the UK**. It sounds like we have a strong consensus" about the goals of tax reform.
4. Big internet companies say they follow tax rules but have paid little tax in Europe, typically by channelling sales via countries such as Ireland and Luxembourg, which have light-touch tax regimes.
5. The G20's debates on changes to the tax code focus **on two pillars** that could be a double whammy for some companies.
6. **The first pillar is dividing up the rights to tax a company where its goods or services are sold** even if it does not have a physical presence in that country.
7. If companies are still able to find a way to book profits in low tax or offshore havens, countries could then apply a **global minimum tax rate to be agreed under the second pillar**.
8. **Britain and France have been arguing for a so-called "digital tax,"** saying corporate tax codes are no longer fair in the age of the large-scale provision of services and the sale of consumer data over the Internet.

## EXTENSION OF PM-KISAN

The government on 8 June 2019 notified a decision **to extend the benefit of Rs 6,000 per year under the PM-KISAN scheme to all 14.5 crore farmers**, irrespective of the size of their landholding, in the country. A decision in this regard was taken in the **first Cabinet meeting of the new NDA government on May 31**. Notifying the decision, the Union Agriculture Ministry has written to all state governments, asking them to identify beneficiaries subject to the "**existing exclusion factors**".

### What

1. Those excluded from **Pradhan Mantri Kisan Samman Siddhi (PM-KISAN)** include institutional land holders, farmer families holding constitutional posts, serving or retired officers and employees of state/central government as well as PSUs and government autonomous bodies.
2. Professionals like doctors, engineers and lawyers as well as retired pensioners with a **monthly pension of over Rs 10,000** and **those who paid income tax** in the last assessment year -- are also kept out of the ambit of the scheme.

3. The Rs **75,000-crore PM-KISAN scheme** was announced in the interim budget, under which the government decided to provide Rs 6,000 per year (in three equal installments) to an estimated 12.5 crore small and marginal farmers **holding land up to 2 hectares**.
4. The **revised scheme envisages to cover two crore more farmers** with an estimated expenditure of Rs 87,217.50 crore in the 2019-20 fiscal.
5. The Centre has also asked state governments to use "**the existing land ownership system**" to identify beneficiaries and transfer the benefit after the family details are uploaded on the PM-KISAN portal.
6. The responsibility of identifying the eligible beneficiary farmers and uploading their data on PM-KISAN portal lies entirely with the state governments.
7. All the state/UT governments are, therefore, requested to expedite 100 per cent enlistment of eligible beneficiaries as per the revised scheme so that farmers are able to avail the benefit of the scheme.
8. **The government so far has enrolled 3.66 crore beneficiaries**. Of these, 3.03 crore have been paid the first installment of Rs 2,000 and two crore have got the second installment as well.

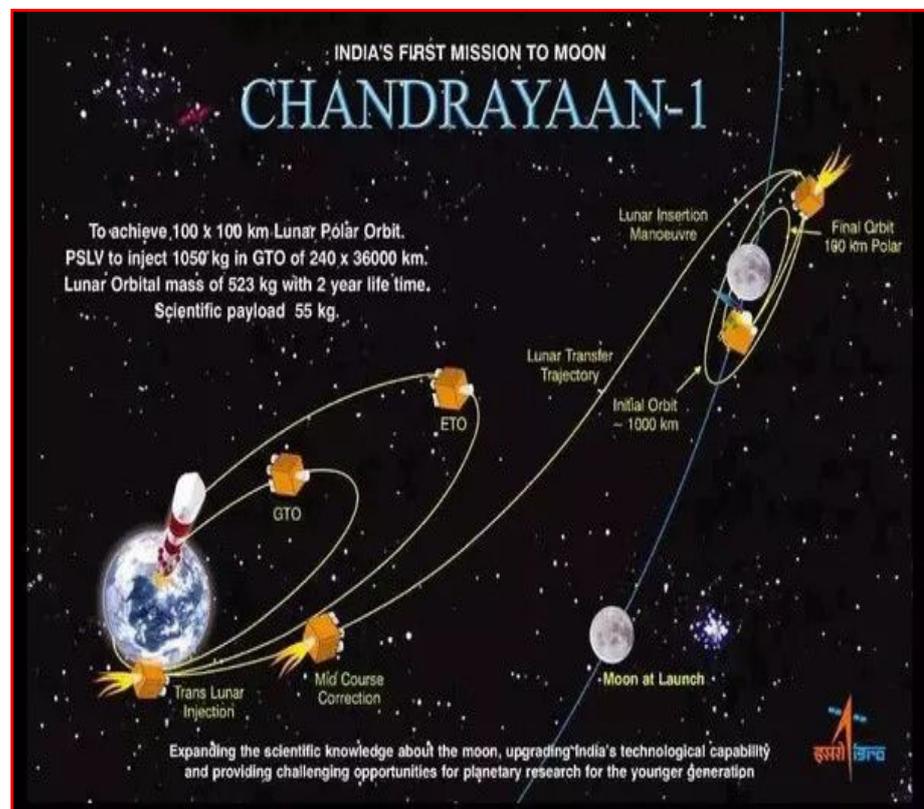
## SCIENCE AND TECHNOLOGY

### WATER DISTRIBUTED ACROSS LUNAR SURFACE

An analysis of data from **India's first mission to the moon, Chandrayaan-1**, and **Nasa's Lunar Reconnaissance Orbiter (LRO)** has found evidence that the **moon's water is distributed across the lunar surface** and not confined to a particular region or type of terrain as stated earlier. The water appears to be present day and night, though it's not necessarily easily accessible.

#### What

1. The space agency added that they derived the conclusion after obtaining data from a **diviner instrument on the LRO**. Nasa has stated that the **new data was obtained from the diviner instrument on LRO**.
2. The team applied this temperature model to data gathered earlier by the



moon mineralogy mapper, a visible and infrared spectrometer that NASA's Jet Propulsion Laboratory in Pasadena, California, provided for India's Chandrayaan-1 orbiter.

3. The findings could help researchers understand the **origin of the moon's water and how easy it would be to use as a resource**. If the moon has enough water, and if it's reasonably convenient to access, future explorers might be able to use it as drinking water or convert it into hydrogen and oxygen for rocket fuel or oxygen to breathe.
4. The results contradict some earlier studies, which had suggested that more water was detected at the **moon's polar latitudes** and that the strength of the water signal waxes and wanes according to the lunar day (**29.5 Earth days**).

## HYBRID MICROBES

Scientists have developed **hybrid organisms that use ambient carbon dioxide and nitrogen** to produce a variety of plastics and fuels. The research is a promising **first step toward low-cost carbon sequestration** and eco-friendly manufacturing for chemicals. By using **light-activated quantum dots** to fire particular enzymes within microbial cells, the researchers were able to create "**living factories**" that eat harmful carbon dioxide and convert it into useful products such as biodegradable plastic, gasoline, ammonia and biodiesel.

### What

1. The **project began in 2013** when researchers started exploring the broad potential of nanoscopic quantum dots, which are tiny semiconductors similar to those used in television sets.
2. **Quantum dots can be injected into cells passively** and are designed to attach and self-assemble to desired enzymes and then activate these enzymes on command using specific wavelengths of light.
3. **Nagpal wanted to see if quantum dots** could act as a spark plug to fire particular enzymes within microbial cells that have the means to convert airborne CO<sub>2</sub> and nitrogen but do not do so naturally due to a lack of photosynthesis.
4. Now, exposure to even small amounts of indirect sunlight would activate the microbes' CO<sub>2</sub> appetite, without a need for any source of energy or food to carry out the energy-intensive biochemical conversions.
5. **Each cell is making millions of these chemicals** and we showed they could exceed their natural yield by close to 200 per cent.
6. The ideal futuristic scenario, Nagpal said, would be to have **single-family homes and businesses pipe their CO<sub>2</sub> emissions directly to a nearby holding pond**, where microbes would convert them to a bioplastic.

## SCIENTISTS SOLVE MOON'S MYSTERY

Scientists have discovered a **mysterious large mass of material**, hidden beneath the largest lunar crater, that is altering the **Moon's gravitational field**. The mass was found under the **Moon's South Pole – Aitken basin**, and may contain metal from the asteroid that crashed into the Moon and formed the crater, according to the researchers from Baylor University in the US. Imagine taking a pile of metal five times larger than the **Big Island of**

**Hawaii** and burying it underground. That's roughly how much unexpected mass we detected.

#### What

1. **The crater itself is oval-shaped**, as wide as **2,000 kilometres and several miles deep**. Despite its size, it cannot be seen from Earth because it is on the far side of the Moon.
2. To measure subtle changes in the **strength of gravity around the Moon**, researchers analysed data from spacecrafts used for the National Aeronautics and Space Administration (NASA) Gravity Recovery and Interior Laboratory (GRAIL) mission.
3. When we combined that with **lunar topography data from the Lunar Reconnaissance Orbiter**, we discovered the unexpectedly large amount of mass hundreds of miles underneath the **South Pole-Aitken basin**, James said. One of the explanations of this extra mass is that the metal from the asteroid that formed this crater is still embedded in the Moon's mantle.
4. The dense mass is weighing the basin floor downward by more than half a mile, according to the research published in the journal Geophysical Research Letters.
5. The **South Pole-Aitken basin** — thought to have been created about four billion years ago — is the largest preserved crater in the solar system. While larger impacts may have occurred throughout the solar system, including on Earth, most traces of those have been lost.

## HYBRID ANTIBIOTICS

**Bacteria resist antibiotics in multiple ways.** One, they produce **efflux pumps** that can throw the antibiotic out from the bacterial cell, stopping the drug from reaching its target in the right concentration. **Two, they can reduce the permeability of the membrane surrounding them**, making it difficult for the antibiotic to pass through. Some bacteria have enzymes that can destroy the active compound — the **chemical ring** — of antibiotics, making them ineffective. There are other mechanisms too.

#### What

1. **Superbugs** — the bacteria resistant to most available antibiotics — are highly evolved as they adapt multiple such mechanisms. So what can be done to destroy them?
2. The use of **combination therapy**, which means administering multiple antibiotics with different action mechanisms — has failed to yield the desired result.
3. Therefore, some pharmaceutical companies are working on 'antibiotic hybrids'. These synthetic constructs increase the access of the antibiotics to the target.
4. **Antibiotic hybrids may have a role as the silver bullet in gram-negative bacteria** to overcome drug resistance as well as extend the spectrum of existing antibiotics. It gives example of drugs like **Cadazolid and MCB-3681** that are in various stages of clinical trials.

## FIRST SEA-BASED SPACE ROCKET

**China launched a space rocket from sea for the first time**, its space agency announced, the latest step in Beijing's push to become a major space power. **China now spends more than Russia and Japan** on its civil and military space programmes — unveiling ambitious plans for missions to the moon and beyond in the coming decade. A **Long March 11 rocket** was launched from a ship in the Yellow Sea just after midday, the China National Space Administration said.

### What

1. The **rocket carried two experimental satellites and five commercial ones**. The test marks another win for Beijing's space programme.
2. Earlier this year, **China became the first nation to land a rover on the far side of the moon**.
3. It also unveiled ambitious plans to build a research base on the lunar surface, send a probe to Mars and build a space station in Earth orbit.
4. In 2003, China became only the third nation to have the capability of launching humans into space.
5. And with sea launches, **China now has the ability to deploy satellites from a mobile platform**.
6. **China joins the U.S. and Russia now as the three global powers** with proven ability to launch rockets into space from sea, which is a competitive advantage when it comes to launch costs and potential incidental damage from misfires.
7. **China is the only country to have launched at sea from a platform** and using launch technology that **they solely and fully own and operate**, since the previous Sea Launch platform used by the US and Russia was created in partnership with a number of nations, including **Norway and the Ukraine**, and ceased operating in 2014.
8. Most recently, Russian-backed firm Sea Launch used a floating platform to launch dozens of rockets between 1999 and 2014.

## CHANDRAYAAN-2 MISSION

**Chandrayaan-2**, the **country's first moon lander and rover mission**, is a month away. The Indian Space Research Organisation has marked **mid-July for the take-off** and kept the launch window open from July 9 to 16. After putting the spacecraft through manoeuvres at the earth end, a journey of over a month and a few more orbital manoeuvres as it approaches the moon, ISRO has set September 6 as the date to soft-land its landing craft at the **lunar South Pole** - a region where no agency has got to so far. ISRO recently listed at **least six complexities of soft landing a mission on the Moon** - something that pioneers Russia and the U.S. could not achieve easily back in the mid-1960s.

### What

1. The **lander is named Vikram** (meaning valour, after the father of the Indian space programme, Vikram Sarabhai). It will release a **small robotic rover**, named **Pragyan (wisdom)**, to move around, feel and understand the lunar surface.
2. Vikram must gently descend on a harsh rugged lunar surface, without getting damaged. It must also avoid landing in a shadowy patch. It needs sunlight for generating its power.
3. Meanwhile, **the mother ship or the orbiter that carries Vikram and Pragyan** will go around the moon at a distance of about 100 km, taking pictures and gathering surface information and sending them back to earth.
4. **The moon's constantly sunny side gets light for 14 Earth days** or one lunar day. The lander and the rover are expected to work for just that duration.

#### Heavyweight launch

1. **Weighing about 3,500 kg**, Chandrayaan-2 will be launched on the **heavy-lift GSLV-Mk III rocket**.
2. The mission has missed many dates and its lander elements have been revamped as recently as in 2018.
3. The tests related to the lander were conducted at the **Challakere multi-agency campus** where ISRO, DRDO, BARC and the IISc facilities are located.

5. The **mission carries 14 payloads or instruments** to observe and gauge the lunar scene – both from a distance and on its surface. One of them is a tiny **NASA reflectometer** to mark the spot for future missions and assess the distance from the earth.

## NASA'S MARS HELICOPTER TESTING

**NASA's Mars Helicopter** — first vehicle in history that will attempt to establish the viability of heavier-than-air vehicles flying on another planet — has successfully passed key tests. **Nobody's built a Mars Helicopter before**, so we are continuously entering new territory, said MiMi Aung, project manager for the Mars Helicopter at **NASA's Jet Propulsion Laboratory in the US**.

### What

1. In January this year the team had operated the flight model in a **simulated Martian environment**.
2. Then the helicopter was moved to Lockheed Martin Space in Denver for compatibility testing with the Mars Helicopter Delivery System, which will hold the **1.8-kilogramme spacecraft against the belly of the Mars 2020** rover during launch and interplanetary cruise before deploying it onto the surface of Mars after landing.
3. As a technology demonstrator, the Mars Helicopter carries no science instruments, NASA said in a statement. Its purpose is to confirm that powered flight in the tenuous **Martian atmosphere** (which has one per cent the density of Earth's) is possible and that it can be controlled from Earth over large interplanetary distances.
4. The Mars Helicopter and its delivery system were checked to make sure that the electrical connections and mechanisms that linked the flight vehicle with its cradle fit snugly. The duo was subjected to vibrations they will experience during launch and in-flight operations.
5. **The thermal vacuum portion of the testing introduced them to the kinds of extreme temperatures** (down to -129 degrees Celsius) that they will encounter in space and on Mars and that could cause components to malfunction or fail.

## MISCELLANEOUS

### AKSHAYA PATRA WINS BBC AWARD

**Akshaya Patra**, a non-profit organisation running one of the **world's largest school meals project in India**, has been awarded the **BBC World Service Global Champion Award** for the programme. The award, presented at the **BBC Food and Farming Awards** in Bristol this week, recognises a person or project that is changing the way the world produces, processes, consumes or thinks about food for the better.

### What

1. The **Bengaluru-based NGO** was selected by an international panel of judges from nominations sent in by the World Service audience around the world.
2. Other projects on the shortlist included UK charity WRAP, and Food 4 Education.
3. The **Akshaya Patra Foundation headquartered in Bengaluru**, India. The organisation **strives to eliminate classroom hunger by implementing the Mid-Day Meal Scheme** in the government schools and government-aided schools.

4. Alongside, Akshaya Patra also aims at countering malnutrition and **supporting the right to education of socio-economically disadvantaged children.**
5. **Since 2000**, Akshaya Patra has been concerting all its efforts towards providing fresh and nutritious meals to children on every single school day.
6. The state-of-the-art kitchens have become a subject of study and have attracted curious visitors from around the world.

## INDIA'S INFANT MORTALITY RATE FALLS

**India's infant mortality rate (IMR)** has fallen from 42 in 2012 to 33 in 2017. However, **the pace of change appears to have slowed down** when compared to the five years before 2012, when it fell from 55 to 42. Given that **India's IMR is even today worse than those of South Asian neighbours** Sri Lanka, Bangladesh and Nepal, the slowdown is worrying.

### What

1. **IMR or the number of babies below one year dying out of every 1,000 born alive** — considered an important marker of a country's health system — has been falling steadily for most regions of the world.
2. The global average **IMR is 29** and that for low and middle income countries, the category that India belongs to, is 34.
3. **The IMR for the European region is 8**, the same as Sri Lanka. In South Asia, India has also been overtaken by Bhutan, Bangladesh and Nepal with IMRs of 28, 29 and 30 respectively.
4. Data from the **sample registration system (SRS)** just released shows that while the rural IMR reduced marginally from the previous year, urban IMR remained the same for India as a whole.
5. In Bihar, Chhattisgarh, Gujarat, Jharkhand, Karnataka, Maharashtra, Punjab and Uttarakhand, there was in fact a marginal increase in IMR in urban areas from 2016 with the highest increase in urban Gujarat and Karnataka going from 19 to 22 in both states.
6. In the case of urban Gujarat, the IMR for females went up from 19 to 23, higher than the increase for males.
7. **Madhya Pradesh and Assam had the worst IMR of 47 and 44 respectively**, while Kerala and Tamil Nadu recorded the lowest IMR of 10 and 16 respectively, among the bigger states. If smaller states and UTs are included, the lowest IMR was recorded in Nagaland and Goa — 7 and 9 respectively.
8. Among states with the highest IMR in 2012, Odisha and Uttar Pradesh showed the biggest improvement with IMR falling for both from 53 to 41 between 2012 and 2017. However, among all states, Jammu and Kashmir showed the biggest improvement with its IMR dropping from 39 to 23.
9. With IMR falling to 33, India is in the company of countries like Tajikistan (33), Botswana (34), Rwanda (32) and South Africa (32). China's IMR is 9.
10. In the neighbourhood, the only countries doing worse than India were Pakistan and Myanmar which had IMRs of 66 and 43 respectively.

## NIPAH VIRUS AGAIN DETECTED

**First known** and documented instance of the **Nipah virus breakout was in Malaysia in 1999**, among pig farmers. This specific virus infection is known to be **extremely contagious in pigs**. The dangerous part is that the infected pigs show no symptoms at all! While **no new outbreaks were later reported in Malaysia**, there were outbreaks reported in Bangladesh and India, linked with the consumption of fruit-based drinks such as raw date palm juice that may have been contaminated by infected fruit bats. Now once again, the **Nipah virus has now been detected in Kerala**.

### What is Nipah Virus?

1. The **Nipah virus is known to be transmitted from animals to humans** as well as through food that is contaminated or consumed directly by people. Intensive medical care is recommended to those who are detected with Nipah virus symptoms.
2. **There are currently no drugs or vaccines specific for Nipah virus** infection although WHO has identified Nipah as a priority disease for the WHO Research and Development Blueprint. Intensive supportive care is recommended to treat severe respiratory and neurologic complications.
3. According to the WHO, the **Nipah virus** is linked to fruit bats belonging to the **Pteropodidae family**, which are considered to be the natural host of this specific virus.
4. A range of illnesses are associated with this **zoonotic virus** such as asymptomatic infection, fatal encephalitis, acute respiratory illness and more. Also, symptoms include dizziness, vomiting, acute respiratory syndrome, sore throat and muscle aches.

## RE-ELECTED FIFA PRESIDENT

**Gianni Infantino was re-elected FIFA president** unopposed at the congress of world football's governing body in Paris on 5 June 2019 as he claimed to have turned the organisation from being "**toxic and almost criminal**" back to its core values. Infantino's re-election was marked by a round of applause from the congress after the statutes were changed earlier in the day to no longer require a vote if there was only one candidate for the position.

### What

1. The **49-year-old Swiss-Italian lawyer** now has a four-year mandate to try and accomplish his grandiose plans for football which were partly frustrated in his first term.
2. He has been in charge of FIFA since February 2016, after succeeding Sepp Blatter in the wake of a damaging corruption scandal that Infantino claimed the body had now shaken off.
3. Infantino claimed 11 areas of progress during his tenure, from financial health, women's development, the fight against racism and a scandal-free 2026 World Cup bidding process. However, he said the implementation of the Video Assistant Referee (VAR) system had been his major triumph.
4. Infantino also used the opportunity to promote the new-look **24-team Club World Cup**, which starts in two years' time but is under threat of a boycott from Europe's top clubs due to concerns over fixture congestion.

## EQUATOR PRIZE FOR 2019

**Women members of Deccan Development Society (DDS) sanghams** have bagged one of the most coveted UN awards — **Equator Prize for 2019**. Since its inception in **2002**, the award, which has been given away 223 times, has come to India only on nine occasions.

### What

1. This year, the **UN had received 847 nominations from 127 countries** and of those, only 20 were given this prestigious honour.
2. The award cites DDS sangham women as “an outstanding example of a local, nature-based solution to climate change and sustainable development”.
3. Over the last 30 years, in their own unsung manner, about 5,000 dalit women of DDS sanghams have made significant contribution towards environment combating climate change, food and nutritional security providing mother earth with lush green cover and establishing iconic village level indigenous seed banks among other initiatives.
4. The US\$10,000-prize was officially **declared on World Environment Day on June 5** and will be handed over to the DDS community members in New York in a special ceremony at UN Headquarters in September.
5. The DDS will felicitate **six women** — Maisanagari Ratnamma, Begari Tuljamma, Nagwar Sunandamma, Yerrolla Kanakamma, Nadimidoddi Anjamma and Chilkapalli Ansuyamma — at Pastapur.

## ‘NISHAN IZZUDEEN’ FOR PM

The **Maldivian government** on 8 June 2019 announced it will confer its highest honour accorded to foreign dignitaries, **Order of the Distinguished Rule of Nishan Izzuddeen**, on Prime Minister Narendra Modi. The decision taken by **Maldives President Ibrahim Mohammad Solih** was announced by Foreign Minister Abdulla Shahid.

### What

1. During his visit, Modi and President Solih will jointly inaugurate two projects — the **Coastal Surveillance Radar System** and the **Composite Training Centre of the Maldives National Defence Forces**.
2. Foreign Secretary Vijay Gokhale described the two as “important projects”, valued at about Rs 180 crore, which will be remotely inaugurated by the two leaders.
3. **This is part of weaning away the Maldives from Beijing**, as China has made deep inroads into the Maldivian establishment during the Abdulla Yameen regime.

## GLOBAL MAP OF WHERE GROUNDWATER MEETS OCEANS

Scientists have created **high-resolution maps of points around the globe where groundwater meets the oceans** — the **first such analysis of its kind** that may help protect **both drinking water and the seas**. In a study published in the journal Geophysical Research Letters, researchers from The Ohio State University in the U.S. showed that **nearly one-half of fresh submarine groundwater discharge flows into the ocean near the tropics**. They also found that regions near active fault lines send greater volumes of groundwater into the ocean than regions that are tectonically stable.

### What

1. They found that **dry, arid regions have very little groundwater discharge**, opening the limited groundwater supplies in those parts of the world to saltwater intrusion.
2. The team worked with researchers at **NASA's Jet Propulsion Laboratory** and the **University of Saskatchewan** to combine topographical data from satellites and climate models to show the flow of groundwater around the world's coasts.
3. The findings may help **coastal communities better protect and manage their drinking water**. Freshwater-groundwater discharge is a natural line of defense against saltwater intrusion.
4. It's a problem that dry regions have as little groundwater discharge as they do because these are also the places where people are going to tend to look for groundwater to meet their freshwater needs.
5. The research work, **the first near-global and spatially distributed high-resolution map of fresh groundwater flow to the coast**, could give scientists better clues about where to monitor groundwater discharge.
6. **Groundwater, for example, can carry higher concentrations of nitrates** — a key contributor of the types of harmful **algal blooms** — as well as high concentrations of mercury.
7. Understanding how and where groundwater gets to surface water could help policy-makers create better plans to improve those bodies of water.
8. The study also found that **climate heavily influences groundwater flow**, and that cities in dry areas are especially vulnerable to salt water contamination of aquifers.

## INDIA'S 1ST BS – VI

**International Centre for Automotive Technology (ICAT)** released **India's first Type Approval Certificate (TAC) for Bharat Stage - VI (BS – VI)** norms for the **two wheeler** segment in New Delhi on 11 June 2019. The certificate was released and handed over by Director ICAT, Dinesh Tyagi to top officials of the **OEM (Original Equipment Manufacturers)**.

### What

1. **Bharat Stage norms are the automotive emission norms** which the automotive manufacturers have to comply to sell their vehicles in India. These norms are applicable to all two wheelers, three wheelers, four wheelers and construction equipment vehicles.
2. To curb growing menace of air pollution through the vehicles emission, the Government of India has decided to leapfrog from the **existing BS –**

#### Flashback

1. **Bharat stage emission standards (BSES)** are emission standards instituted by the Government of India **to regulate the output of air pollutants from internal combustion engines** and Spark-ignition engines equipment, including motor vehicles.
2. The standards and the timeline for implementation are set by the **Central Pollution Control Board under the Ministry of Environment & Forests and climate change**.
3. The standards, based on European regulations were first introduced in 2000. Progressively stringent norms have been rolled out since then.
4. All new vehicles manufactured after the implementation of the norms have to be compliant with the regulations.

- IV norms to the BS- VI**, thereby skipping the **BS – V norms**, and to implement the **BS – VI norms** with effect from 1st April 2020.
3. Last year, ICAT issued the approval for **BS –VI norms** to M/s Volvo Eicher Commercial Vehicles for the Heavy Commercial Vehicle segment which was also the first in its segment in India.
  4. **ICAT is the premier testing and certification agency** authorized by Ministry of Road Transport and Highways for providing testing and certification services to the vehicle and component manufacturers in India and abroad.

## INDIA TO JOIN HEAVYWEIGHT TORPEDO CLUB

**India's underwater weaponry** is set to get more fire power with the Navy deciding to induct indigenously developed **heavyweight torpedo 'Varunastra'** into its arsenal. With this, **India will join a group of only eight countries** to have the capability to manufacture heavyweight torpedoes. The weapon has been indigenously developed by **Naval Science and Technology Laboratory, Visakhapatnam**.

### What

1. **Bharat Dynamics Limited (BDL) in Hyderabad** has signed a contract worth Rs 1,187 crore to manufacture the **torpedoes to arm both warships and submarines**.
2. BDL said that the manufacturing would take place at its Visakhapatnam unit in **collaboration with DRDO**.
3. **The Varunastra is a shiplaunched**, electrically-propelled underwater weapon equipped with one of the most advanced automatic and remote-controlled guidance systems. The weapon system uses **its own intelligence in tracing the target**.
4. **Varunastra is considered to be 95% indigenous**. BDL, which was involved in the production of the torpedo, had earlier delivered it to the Navy in 2016 which evaluated it. Subsequently, a decision was taken to order for the production.
5. **Varunastra can hit stealth submarines underwater**. The ship-launched missiles can also be launched from a shore. It is seven to eight-metres long and weighs 1,500kg.
6. The antisubmarine electric torpedo when fired can travel at 40 knots or 74km/hour. According to DRDO, it can be launched from ships and submarines. India also intends to sell the torpedo to friendly nations.