



# IAS PARLIAMENT

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A Shankar IAS Academy Initiative

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## INDEX

<b>G.S PAPER II.....</b>	<b>7</b>	11.1	Failure with Vikram Lander .....	43
<b>1. History.....</b>	<b>7</b>	11.2	Quantum Supremacy - Google Researchers .....	44
1.1 Bengal Famine .....	7	<b>12. Environment.....</b>	<b>44</b>	
<b>2. POLITY .....</b>	<b>9</b>	12.1	Restoration of Degraded Land - UNCCD.....	44
2.1 Civil Liberties and Courts' Role - Jammu and Kashmir Case 9		12.2	'Green Bonus' Demand of Himalayan States .....	45
2.2 Removal of Sikh Names from Central Adverse List... 11		12.3	Atlantic Meridional Overturning Current.....	47
<b>3. Government Acts &amp; Policies .....</b>	<b>12</b>	<b>13. Internal Security .....</b>	<b>48</b>	
3.1 Motor Vehicles (Amendment) Act, 2019.....	12	13.1	Concerns with UAPA Tribunals.....	48
3.2 An Appeal to Unify India with Hindi .....	13	13.2	India's Nuclear Weapon Policy.....	49
<b>4. Social Justice.....</b>	<b>15</b>	<b>PRELIM BITS .....</b>	<b>51</b>	
4.1 Status of Policing in India Report 2019 .....	15	<b>14. History and Art &amp; Culture .....</b>	<b>51</b>	
4.2 Need For Worker Safety Law .....	16	Dadabhai Naoroji Birth Anniversary.....	51	
<b>5. Health.....</b>	<b>17</b>	Indo-European language origins .....	51	
5.1 Hepatitis B Control .....	17	Harappan Civilization DNA Study.....	52	
5.2 Study on Cardiovascular Diseases and Cancer .....	19	Asiatic Society of Mumbai.....	52	
5.3 Vaccine Hesitancy - Measles Spread.....	20	Marsiya Poetry in India.....	53	
5.4 Pregnancy in Old Age - Risks and Legal Shortcomings 22		<b>15. Polity .....</b>	<b>53</b>	
<b>6. India &amp; Its Neighborhood .....</b>	<b>24</b>	HC guidelines on Article 25.....	53	
6.1 India-Pakistan Trade Tensions.....	24	<b>16. Geography .....</b>	<b>53</b>	
6.2 India-Nepal Pipeline .....	25	IMD Colour-Codes .....	53	
<b>7. Bilateral Relations.....</b>	<b>25</b>	Krishna Water dispute .....	54	
7.1 Apology of Archbishop of Canterbury.....	25	Goldschmidite.....	55	
7.2 India-U.S. trade deal.....	27	<b>17. Social issues .....</b>	<b>55</b>	
<b>8. International Issues.....</b>	<b>28</b>	Legal age for Marriage.....	55	
8.1 Withdrawal of Hong Kong's Extradition Bill.....	28	<b>18. Government Initiatives.....</b>	<b>56</b>	
8.2 Division between the EU and the U.S. - Iran's Crisis 29		Project Bal Basera.....	56	
8.3 Ending U.S.-Taliban Peace Talks .....	30	Cyberdome.....	56	
8.4 Saudi Oil Attacks.....	30	<b>19. Government Schemes .....</b>	<b>56</b>	
<b>9. Economy.....</b>	<b>32</b>	National Educational Alliance for Technology.....	56	
9.1 India's Nearing Stall.....	32	Participatory Guarantee Scheme .....	57	
9.2 RBI Circular on Lending Rate.....	34	Eastern Economic Forum .....	58	
9.3 Employment Scenario - Skilling India .....	35	<b>20. International organisations .....</b>	<b>58</b>	
9.4 Corporate Tax Rate Cut .....	37	CARICOM Countries .....	58	
9.5 RBI's Moves on Punjab and Maharashtra Cooperative Bank 38		SCO's Eurasian Economic Forum.....	59	
9.6 Secondary Market for Corporate Loans - Manoharan Committee .....	39	<b>21. International issues and events.....</b>	<b>59</b>	
<b>10. Infrastructure.....</b>	<b>40</b>	Specially Designated Global Terrorist .....	59	
10.1 PPP model, States Role in Highways Construction... 40		<b>22. Economy .....</b>	<b>60</b>	
10.2 Sutlej-Yamuna Link Canal.....	42	Floor Space Index.....	60	
<b>11. Science &amp; Technology .....</b>	<b>43</b>	The Federal Reserve Interest Rates .....	61	
		<b>23. Environment.....</b>	<b>61</b>	
		COP14 of UNCCD.....	61	
		Drought-forecasting toolbox.....	62	



<i>New Delhi Declaration</i> .....	62	<i>Astra Missile</i> .....	70
<i>Bamboonomics</i> .....	63	<i>Russian-built Floating Nuclear Plant</i> .....	70
<i>Global Climate Strike Movement</i> .....	63	<i>Hydrogen-powered vehicles over Electric vehicles</i> .....	71
<i>Global Solar Park</i> .....	64	<i>Indigenous Fuel Cell System</i> .....	71
<i>Forest-PLUS 2.0</i> .....	64	<i>Kalam Centre for Science and Technology</i> .....	72
<i>Climate change and Bananas</i> .....	64	<i>Influenza classification</i> .....	72
<i>Cryodrakon Boreas (Cold dragon of the North Winds)</i> .....	65	<i>African Swine Fever (ASF)</i> .....	72
<i>Zero-budget Farming</i> .....	65	<i>Eradicating Malaria by 2050</i> .....	73
<i>Happy Seeder (HS) and its effects on Wheat yield</i> .....	66	<i>Bombay Blood Group</i> .....	74
<b>24. Science and Technology</b> .....	<b>66</b>	<i>National Animal Disease Control Programme (NADCP)</i> .....	74
<i>Deflecting an Asteroid</i> .....	66	<i>Salmonella</i> .....	75
<i>James Webb Space Telescope (JWST)</i> .....	67	<i>Dangers of artificial ripening of Fruits and Vegetables</i> .....	75
<i>Avalanche on Mars</i> .....	67	<i>NIKSHAY</i> .....	76
<i>Mars Reconnaissance Orbiter (MRO)</i> .....	67	<i>LRRK2</i> .....	77
<i>K2-18b</i> .....	68	<i>Report on food wastage</i> .....	77
<i>Interstellar objects</i> .....	68	<i>Lightning Report</i> .....	78
<i>Sagittarius A</i> .....	69	<i>The Lancet Child &amp; Adolescent Health Report</i> .....	78
<i>Naming of an Asteroid</i> .....	69	<i>International Migrant Stock 2019</i> .....	79
<i>Apache Helicopter</i> .....	69	<i>All India Survey on Higher Education (AISHE) 2018-19</i> .....	80
<i>Tejas - Light Combat Aircraft (LCA)</i> .....	70	<i>United in Science Report</i> .....	80



## SEPTEMBER 2019

### G.S PAPER II

#### 1. HISTORY

##### 1.1 Bengal Famine

###### What is the issue?

- The Bengal famine, that began in 1943, took half as many lives as the German's holocaust did.
- Yet, it doesn't have a Remembrance Day like Jallianwala Bagh.
- It is continued to be perceived as a tragic occurrence and not an atrocity.

###### What were the contributory factors?

- Then U.K. Prime Minister Winston Churchill, as part of the western war effort, ordered the diversion of food from starving Indians to already well-supplied British soldiers and stockpiles in Britain and Europe.
- It is very common to hold the British government's diversion of food grains, responsible for the famine.
- But the fact that enough food was available within India to prevent its occurrence cannot be ignored.
- The Earl of Huntington in a parliamentary debate observed that losses were mainly due to exceptional crop production in Northern India in the spring of 1943.
- Then Viceroy, Lord Linlithgow, acknowledged that Punjab cultivators were engaged in blackmailing the starving peasants of Bengal to make inordinate profits.
- The British government paid inflated price in the open market to ensure supplies which made grains unaffordable for ordinary Indians.
- Official records in the British Library also establish that the famine was not the outcome of a lack of food grain alone.
- Rather, political machinations, greed, hoarding and incompetent bureaucratic blocked efforts to procure and transport grain from Punjab and the United Provinces.
- The loss of Burma rice and cyclone of 1942 were other factors.

###### How was it handled?

- The British-Indian administration made efforts to create records rather than take resolute action.
- Everyday thousands of emaciated dead had to be removed from the streets of Calcutta by police and corpse disposal organisations.
- As more of starving people from the countryside moved into Calcutta city, then Chief Minister of Bengal, Khawaja Nazimuddin, removed them from the city by force.
- Lord Strabolgi, observed in the House of Lords that the occurrence of the disaster was mainly contributed to the ironbound bureaucracy and its procrastination.
- He quoted that "They consider too long, they set up too many Committees, they talk too long about what they are going to do, and in the meanwhile this terrible famine was galloping towards them."
- In 1944, The Intelligence Bureau alerted about the possibility of its recurrence, if measures are not taken to prevent hoarding, control pricing and introduce rationing in the larger towns.



## 1.2 Odisha's Paika Rebellion

### What is the issue?

- The Odisha government identified 10 acres of land for the Paika memorial in Khordha district, dedicated to the 1817 Paika Rebellion.
- President Ram Nath Kovind will visit the Khordha to lay the foundation of the memorial.

### What is the Paika rebellion of 1817?

- Paikas had been recruited since the 16th century by kings in Odisha.
- They were from a variety of social groups who render martial services in return for the rent-free land (nish-kar jagirs) and titles.
- After entering Odisha in 1803, the British introduced new revenue settlements due to which many Odia proprietors ended up losing their lands to absentee Bengali landlords.
- Changes in the currency and revenue systems meant the Odias had to pay taxes in silver, which was more expensive for them.
- This resulted in further marginalisation and oppression of the Odias.
- In 1817, Kondhs who belonged to the state of Ghumsur banded together to revolt against the British.
- Bakshi Jagabandhu Bidyadhar Mohapatra Bharamarbar Rai, the highest-ranking military general of King of Khorda Mukund Dev II, led the Paikas to join the uprising.
- During the course of the rebellion, they burnt government buildings in Banapur, killed policemen and British officials, and looted the treasury.
- The uprising lasted few months but was eventually crushed by the better-equipped and trained forces of the East India Company (EIC).
- Bakshi escaped to the jungles, and ultimately surrendered in 1825 under negotiated terms.

### Why is the rebellion being remembered now?

- **200th anniversary of the Paika Rebellion (April 2017)** - Prime Minister Narendra Modi honoured descendants from 16 families that were associated with the uprising.
- By recognising the contribution of these families, and by associating itself with the Paika tradition, the BJP hoped to tap into latent sub-nationalist impulses in the politics of Odisha.
- **July 2017** - Odisha government decided to formally ask the Centre to declare the rebellion as the “first war of independence in Indian history”.
- On this, then Culture Minister Ashok Chandra Panda had said, “In the real sense, the rebellion of Khorda in 1817 is the first well organised rebellion against the British.”
- **May 2018** - After a review of school textbooks, the NCERT introduced a page on the Paika rebellion in the Class-8 history textbook.
- **December 2018** - Modi released a stamp and a coin to commemorate the rebellion.

### Was it a nationalist movement or a peasant rebellion?

- The Paika Rebellion is one among the peasant rebellions that took place in India when the British EIC was expanding its military enterprise.
- Because these uprisings violently clashed with European colonialists and missionaries, their resistance is sometimes seen as the first expression of resistance against colonial rule.



- Therefore considered to be “nationalist” in nature.

## 2. POLITY

### 2.1 Civil Liberties and Courts' Role - Jammu and Kashmir Case

#### What is the issue?

- Following the Centre's move to [downgrade J&K's 'special status'](#) under Article 370 of the Constitution, there have been strict limitations to civil liberties.
- In this context, here is an overview on the principles behind rights suspension and the crucial role of Courts in this.

#### What was SC's rationale behind rights suspension?

- 'Ultimately, the object of depriving a few of their liberty for a temporary period has to be to give to many the perennial fruits of freedom.'
- It was this idea that made Supreme Court held that the fundamental rights to life and liberty stood suspended during Indira Gandhi's Emergency.
- It also held that the judiciary was to 'act on the presumption that powers [of preventive detention] are not being abused'.
- The court's verdict in this popular '[habeas corpus judgment](#)' was based upon the principle of '[executive supremacy](#)'.
- This principle holds that in 'times of peril', civil liberties must be subordinated to the interests of the state.
- In such case, it is the government that will decide -
  - i. What these 'times of peril' are
  - ii. Whose rights will be curtailed
  - iii. How the rights will be curtailed
  - iv. When the freedoms will be restored

#### What were the drawbacks in this?

- India's republican Constitution is based upon a system of checks and balances.
- So, even the government must always be held accountable for its actions.
- When these actions infringe fundamental rights, accountability must be sought in a court of law.
- The habeas corpus judgment betrayed that principle.
- The government committed excesses under the cover of the habeas corpus judgment, that included the torture and murder of dissidents.
- All these came to light after the end of the Emergency.
- The whole episode highlighted just one basic principle - 'absolute power corrupts absolutely'.

#### What was the alternative principle?

- In 2017, the judiciary formally overruled the principle behind the habeas corpus judgment.
- In its place, the court erected the [principle of proportionality](#).

- By this, the state could infringe peoples' rights in service of a larger goal.
- But, it must demonstrate that the measures it is adopting bear some rational relationship with the goal.
- More importantly, it must show that rights are being infringed to the minimum possible extent.
- Also, the constitutionality of the state's actions is to be tested by the courts.

### **How is liberty at present in J&K?**

- From August 5, 2019, the State of J&K has been placed under a 'communications lockdown'.
- A communications shutdown
  - i. violates the freedom of speech and expression
  - ii. prevents those outside the State from being in touch with their families
  - iii. provides cover for civil rights violations that cannot come to light
  - iv. damages an entire infrastructure, of health, food, and transport
- In addition to this, political leaders along with an unknown number of other individuals have been detained.
- Detention self-evidently violates personal liberty.
- The government argues that communication was cut off to hamper terrorists' plots.
- Also, it says that political leaders would remain in custody until 'the environment is created for democracy to function'.
- However, both moves - communication lockdown and detention - certainly violate crucial fundamental rights.
- A few days earlier, rights experts from the United Nations had called the communication lockdown a form of "collective punishment".
- Under the guise of 'prevention', an entire population's rights were taken away for the actions of a few.

### **Are the courts playing its role rightly?**

- Unlike during the Emergency period, the courts have not outrightly upheld the government's actions, so far.
- However, they have not condemned the moves either.
- Instead, the courts are delaying, evading and adjourning the case.
- E.g. Political leader Shah Faesal's petition challenging his detention has been twice adjourned by the Delhi High Court
- At the Supreme Court too, petitions challenging the lockdown have been repeatedly adjourned.
- But, most worryingly, the court has engaged in perversion of the right to habeas corpus.
- On petitions challenging detentions, the Supreme Court has 'authorised' the petitioners to go to Kashmir and 'meet' the individuals under detention.
- In other words, the court did not call upon the government to justify itself.
- It has merely sought to show ad hoc compromises in individual cases, without discharging its constitutional obligation to adjudicate the legality of the lockdown and the detentions.
- [But, under India's constitutional scheme, no citizen needs a certificate of permission from a court to travel through the country.]

### What are the key concerns now?

- By not ruling upon the cases before it, the courts have allowed the infringements of civil liberties to continue.
- The courts, in effect, have -
  - i. exempted the government from its constitutional obligation to explain itself
  - ii. exempted the courts themselves from their obligation to hold the government to account
- All these merely give place for executive supremacy, which the courts should urgently address by breaking its silence.

### 2.2 Removal of Sikh Names from Central Adverse List

#### Why in news?

The Centre has removed names of 312 Sikh foreign nationals involved in anti-India activities from its blacklist/the Central Adverse List.

#### What is the Central Adverse List?

- The Ministry of Home Affairs maintains a list officially named as the Central Adverse List.
- It has more than 35,000 names on it.
- It includes the names of individuals who supported the Khalistan movement in 1980s and 1990s but left India to take asylum in foreign countries.
- These are those who were in favour of a separate Sikh state and had opposed the [Operation Blue Star](#).
- Many of the Sikhs on this list fled India to escape the authorities and acquired foreign nationality and took asylum outside India.
- This list is not restricted to Punjab or the Khalistan movement alone.
- It has names of those individuals who are suspected to have links with terrorist outfits or have violated visa norms in their previous visit to India.
- The list also includes the names of those persons who have indulged in criminal activities or have been accused of sexual crimes against children in their respective countries.

#### What is the purpose?

- It is a step taken by the Indian government to maintain internal security.
- This list is constantly used by all Indian Missions and Consulates to stop the individuals named in it from entering India.
- This is done by not granting visa to such persons.
- The list is also used to keep serious offenders outside India as a person may commit a crime in the native nation and then apply for an Indian visa to escape prosecution.

#### How is the list maintained?

- The list is maintained by the Union Ministry of Home Affairs with inputs from all the state governments.
- Various intelligence agencies constantly review this list and add new names to it.
- Central intelligence agencies as well as the state-level intelligence contributes to the information, determining the inclusion of a person in this list.



- Since law and order is a state subject, the state police is also utilised for intelligence gathering in order to update the list.

#### **What does the recent decision mean?**

- Most of the Sikh nationals in the list have remained outside the country since the 1980s and have not visited their families since then.
- With the names being removed, they can now visit India and meet their families here.
- They could also get access to consular services as well as an Indian visa.
- This list had a multiplier effect in denying visas as the family members of the persons on this list were also denied visas to other countries.
- Such a practice will no longer be carried forward.

### **3. GOVERNMENT ACTS & POLICIES**

#### **3.1 Motor Vehicles (Amendment) Act, 2019**

##### **What is the issue?**

- The steep penalties for violation of road rules under the [Motor Vehicles \(Amendment\) Act, 2019](#) recently came into force.
- With much opposition to this, here is a look at the causes and the measures to be taken.

##### **How is the implementation of the Act?**

- Motorists have reacted with outrage at the imposition of fines by the police.
- Many State governments have opted to reduce the quantum of fines, or even to reject the new provisions.
- E.g. Gujarat has announced a substantial reduction in the fines, West Bengal has refused to adopt the higher penalties
- Karnataka and Kerala are studying the prospects to make the provisions less stringent, and others are proceeding with caution.

##### **Is the law itself unjustified?**

- India has some of the deadliest roads in the world, and close to 1,48,000 people died in road accidents only during 2017.
- So, the intent behind amending the Motor Vehicles Act cannot be faulted.
- Besides, the Union Transport Minister has reiterated that it is left to the States to choose the quantum of fines.
- This is because it is the states' responsibility to bring about deterrence and protect the lives of citizens. This argument is also valid.

##### **Why is the opposition then?**

- The outrage is especially due to the fact that State governments are enforcing the law without at first upgrading road infrastructure.
- They have neither made the administrative arrangements for issue of transport documents.
- So, the question is whether enhanced fines can radically change the accident record when other determinants as the above are not addressed.

### What is the provision in this regard?

- The core of reform lies in Section 198(A) of the amended law.
- It requires any designated authority, contractor, consultant or concessionaire to meet the standards laid down by the Central government.
- These are those responsible for the design or construction or maintenance of the safety standards of the road.
- This provision prescribes a penalty for a violation leading to death or disability.
- It can be enforced through litigation by road users in all States.
- Since the standards are laid down, compliance should be ensured without waiting for a road accident to prove it.

### What should be done?

- Until infrastructure meets legal requirements, fines and enforcement action are naturally liable to be challenged in courts.
- [The condition of roads, traffic signals, signage and cautionary markings would all fall within its ambit.]
- The culture of impunity that allows government vehicles and VIPs to ignore road rules should be put to an end.
- State governments should reform their Regional Transport Authorities, as these offices are generally steeped in corruption.
- The Union Transport Ministry should speed up making mandatory the electronic delivery of RTO services, which is being delayed for long.
- Also, the National Road Safety Board should soon be formed to recommend important changes to infrastructure and enable professional accident investigation.

## 3.2 An Appeal to Unify India with Hindi

### What is the issue?

Union Home Minister Amit Shah on the occasion of Hindi Diwas made an appeal to unify India with the country's most widely-spoken language - Hindi.

### Why this idea won't be uniting India?

- **Historical** - Our tragedy was we were colonised by linguistically challenged islanders who couldn't think beyond one language.
- This idea is not in tune with our history, culture and civilisation.
- We are a multilingual society.
- Speaking more than one language comes naturally to us.
- **Outdated** - The real problem is that notwithstanding this multiplicity, we need one language to unite the country.
- Another problem is that can only be Hindi.
- **'One nation, one language, one culture'** is a 19<sup>th</sup> century European idea and it **failed** to create unity.
- It's good to move away from this colonial idea.
- **Relevance** - It does not matter how many speak Hindi.

- The issue is about whether it can connect the country.
- The Constitution is what that really connects the country which has made space for 22 languages in the Eighth Schedule.
- It upholds the language diversity principle.
- So, it cannot be said that one particular language should be brought forward to connect Indians.
- **Capacity** - When a language tries to expand beyond its semantic-carrying capacity, it starts breaking up.
- So, the government shouldn't interfere with the linguistic behaviour or choices of people.
- **Animosity** - If there is a mechanical idea of unity based on an entity, it would generate hostility beyond its immediate borders.
- **Majority** - As per the 2011 Census, there are 1,369 mother tongues in India.
- It may be true that Hindi is spoken by a larger number of people in India.
- It is also equally true that it is not spoken by a majority of Indians.

#### **What would be its effect on other languages?**

- All tribal languages are rapidly disappearing.
- That is because there are not enough livelihood opportunities in those languages.
- People are getting assimilated in some larger language.
- India is uniquely gifted in that out of the world's 6,000 languages, we have close to 10% of the spoken languages.
- It would be unwise to become a one language or only a bilingual nation.
- There may be semantic areas where English works but Hindi fails and vice versa. So, we need both and we need all Indian languages.

#### **How to choose a common linguistic vehicle for communication, governance, etc?**

- In 1955-56, linguistic States were created in India.
- Today nearly 35% of people are migrating daily for work.
- Any idea of one link language will be economically disastrous for India.
- It will slow down migration and reduce the ease of capital flow.
- In such a situation, we have to conceptualise a new form of language identity for our States.
- Our cities must be recognised as multilingual entities.
- This will help us in unhinging the education policy for some large metropolises.
- The current practice of clubbing together multilingual spaces with monolingual habitats is not fair to the large cities today.
- The language choice of citizens should be widened and not narrowed by the state.



## 4. SOCIAL JUSTICE

### 4.1 Status of Policing in India Report 2019

#### Why in news?

The report on the Status of Policing in India, jointly developed by NGO Common Cause and the Centre for the Study of Developing Societies, was released recently.

#### What is the report on?

- This is the second such joint report.
- The report surveys on police adequacy and working conditions.
- The latest report surveys 12,000 police persons across 22 states together with their family members (around 11,000).
- **Significance** - The report offers a potent explanation for the low credibility of the police in public perception.
- In October 2018, the Delhi High Court in its judgment on the [Hashimpura massacre case](#) relied on the 2018 edition of the Status of Policing in India Report.
- With the report's findings, it established the institutional bias of the police force against Muslims to convict 16 policemen for killing 42 people in 1987.

#### What are the key findings of 2019 report?

- **Infrastructure** - Across the states -
  1. 70 police stations did not have wireless devices
  2. 214 police stations lacked telephone access
  3. 24 police stations had neither of the above
- Police stations, on average, have just 6 computers and states like Bihar and Assam less than one.
- Nearly 240 stations did not even have vehicles.
- 1 in 5 women in the police said she lacked a separate toilet.
- The police work, on average, 14 hours a day.
- **Social attitude** - Police forces exhibit frightening prejudices against women, lower castes, and minorities.
- One in four male personnel demonstrate high bias against their female colleagues.
- About one in four police persons in several states does not receive any kind of gender sensitisation training.
- Most of them see complaints of gender-based violence as false and motivated, which explains why most sexual assaults go unreported.
- Nearly one-fourth of the women personnel surveyed reported of the absence of the Internal Committee mandated for dealing with sexual harassment at workplace.
- One in two police personnel surveyed feel that Muslims are likely to be “naturally prone” to committing crimes.
- 35% of police personnel interviewed think that it was natural for a mob to punish the “culprit” in cases of cow slaughter.
- 43% think it is natural for a mob to punish someone accused of rape.



- 37% personnel interviewed feel that for minor offences, a small punishment should be handed out by the police rather than a legal trial.
- 72% police personnel experience “political pressure” during investigation of cases involving influential persons.
- The frequent transfers of senior police persons who do not conform to a political leader’s demands have entered the realm of popular culture.

#### **What does this imply?**

- The findings are certainly worrying when rapid social transformation demands a robust and sensitised police force in the country.
- The training given to officers, a 6-month crash course on civil and Criminal Procedure Codes, the Indian Penal Code and the Evidence Act may not be sufficient.
- On the other hand, there are simply not enough people to do the fundamental job.
- E.g. in U.P. and Haryana, there are as many as 60% and 53% vacancies in positions reserved for SCs, STs, OBCs, and women
- There are vacancies at all ranks, but those in senior ranks are higher than those in the constabulary.

#### **What is to be done?**

- There is a need to insulate police personnel from political influence.
- Transfer as a form of punishment for displeasing someone should be reconsidered.
- Unlike most functioning democracies, India’s police force does not have its genesis in the concept of public service.
- It is instead the creation of the British as an instrument of enforcement and oppression.
- So, above all, India’s police force should be redesigned to work as a protector of citizens - of all citizens’ security, rights, and property, without bias.

### **4.2 Need For Worker Safety Law**

#### **What is the issue?**

Major industrial accidents draw attention to the essentiality of stronger worker safety law.

#### **How is occupational safety at present?**

- Recent notable industrial accidents include -
  - i. deaths of four people, including a senior officer, in a fire at the Oil and Natural Gas Corporation gas facility in Navi Mumbai
  - ii. the tragedy that killed nearly two dozen people at a firecracker factory in Batala, Punjab
- A safe work environment is a basic right and India’s recent decades of high growth should have ushered in a framework of guarantees.
- But, unfortunately, successive governments have not felt it necessary to ratify many fundamental conventions of the International Labour Organization (ILO).
- These cover organised and unorganised sector workers’ safety, including the Occupational Safety and Health Convention, 1981.



- India's record in promoting occupational and industrial safety remains weak even with years of robust economic growth.
- Making work environments safer remains a low priority, although the productivity benefits of such investments have always been clear.
- The consequences are frequently seen in the form of a large number of fatalities and injuries.
- But despite these, in a market that has a steady supply of labour, policymakers tend to ignore the wider impact of such losses.

### **What are the concerns in this regard?**

- Such incidents make it imperative that the Central government abandon its disregard for dealing with industrial safety challenges.
- The government should engage in serious reform but there is not much evidence of progressive moves.
- The [Occupational Safety, Health and Working Conditions Code, 2019](#) was introduced in the Lok Sabha in July 2019.
- It aims to combine 13 existing laws relating to mines, factories, dock workers, building and construction, transport workers, inter-State migrant labour and so on.
- However, it pays little attention to the sector-specific requirements of workers.
- One of its major shortcomings is that formation of safety committees and appointment of safety officers is left to the discretion of State governments.
- Evidently, the narrow stipulation on safety officers confines it to a small fraction of industries.
- The ILO instruments cover several areas of activity that the recent occupational safety Code seeks to amalgamate.
- But, the code comes without the systemic reform that is necessary to empower workers.

### **What should the priority be?**

- The Factories Act currently mandates the appointment of a bipartite committee in units that employ hazardous processes or substances.
- This and such other provisions should certainly be retained in the new code.
- It is essential, therefore, that the new Code is reworked to include the much-needed missing provisions.

## **5. HEALTH**

### **5.1 Hepatitis B Control**

#### **Why in news?**

Bangladesh, Bhutan, Nepal and Thailand became the first four countries in the WHO's South-east Asia region to have successfully controlled hepatitis B.

#### **What is hepatitis B?**

- Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease.
- The virus is most commonly transmitted from mother to child during birth and delivery, as well as through contact with blood or other body fluids.



- WHO estimates that in 2015, 257 million people were living with chronic hepatitis B infection (defined as hepatitis B surface antigen positive).
- Hepatitis B can be prevented by vaccines that are safe, available and effective.
- The virus is said to be controlled when the disease prevalence is reduced to less than 1% among children less than 5 years of age.

### What is the case with India?

- India introduced hepatitis B vaccine in the Universal Immunisation Programme in 2002 and scaled-up nationwide in 2011.
- **Vaccination coverage** - A study published in 2013 found lower coverage of hepatitis B vaccine in 8 of the 10 districts surveyed.
- But, the coverage has increased with the introduction of a pentavalent vaccine on a pilot basis in Kerala and TN in 2011 and national roll-out in 2014-2015.
- According to the WHO, the coverage of hepatitis B third dose had reached 86% in 2015.
- **Prevalence** - Despite the above, about 1 million people in India become chronically infected with the virus every year.
- According to the Health Ministry, as on February 2019, an estimated 40 million people in India were infected.
- Hepatitis B infection at a young age turns chronic, causing over 1,00,000 premature deaths annually from liver cirrhosis or liver cancer.
- Despite the high vaccination coverage, disease prevalence in children aged less than 5 years has not dropped below 1%.
- One of the reasons for this is the sub-optimal coverage of birth dose in all infants within 24 hours of birth.

### How significant is the birth dose?

- Hepatitis B birth dose, given in the first 24 hours, helps prevent vertical transmission from the mother to child.
- The compulsion to increase birth dose to cut vertical transmission arises from two important reasons:
  1. about 70-90% newborns infected this way become chronic carriers of hepatitis B
  2. about 20-30% carriers in India are due to vertical transmission
- But even 7 years after the Health Ministry approved the birth dose in 2008, its coverage remained low - 45% in 2015 and 60% in 2016.
- More worryingly, even in the case of institutional delivery, the birth dose vaccine coverage is low - 76.36% in 2017.
- Incidentally, institutional delivery accounts for about 80% of all deliveries in the country.
- The birth dose coverage when delivery takes place outside health-care institutions is not known.

### What is the reason for low coverage?

- One of the reasons for the low coverage is the fear of wastage of vaccine when a 10-dose vial is used.
- [*Vial* - a small container, mostly cylindrical and made of glass, used especially for holding liquid medicines]
- Unfortunately, health-care workers are very often unaware of the WHO recommendation that allows hepatitis B open-vial policy.

- Opened vials of hepatitis B vaccine can be kept for a maximum duration of 28 days for use in other children if the vaccine meets certain conditions.

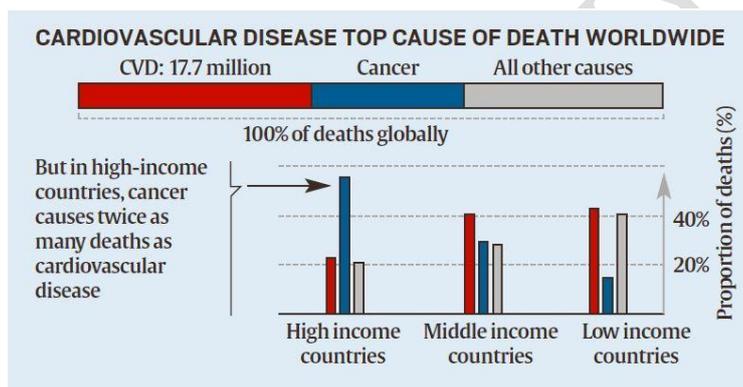
## 5.2 Study on Cardiovascular Diseases and Cancer

### Why in news?

A study by the Prospective Urban and Rural Epidemiologic (PURE) on cardiovascular diseases was recently published online in The Lancet journal.

### What are the major findings?

- The study analysed the situation in 21 countries across 5 continents, categorised by income levels.
- **CVD** - Household air pollution has emerged as one of the key causes of cardiovascular diseases (CVDs).
- 12% of all CVDs in low-income countries are attributable to household air pollution.
- Hypertension is the largest risk factor for CVD in low-income countries including India.
- This is followed by high non-HDL cholesterol and household air pollution.
- Besides medical reasons, the single largest risk factor for cardiovascular diseases is low education level.
- **Deaths** - CVD remains the leading cause of mortality among middle-aged adults globally.
- However, this is no longer the case in high-income countries, where cancer is now responsible for twice as many deaths as CVD.
- In high-income countries, people have started living longer, so deaths due to CVD have reduced, and more are now dying due to cancers.



### What does it mean for India?

- In low-income countries, including India, CVD is still the top killer.
- Deaths due to CVD here are three times more frequent than that due to cancer.
- Household air pollution is a greater risk factor for CVD in India than diabetes, tobacco use, low physical activity and poor diet.
- An earlier report from a PURE study showed that Indians had the lowest lung function among the 21 countries studied.
- At least 65% of homes in India use biomass fuel for cooking and heating.
- In urban areas, the use of mosquito coils, dhoop sticks and agarbattis contribute to high household air pollution.
- Household air pollution is becoming an important cause of overall and cardiovascular mortality in low-income countries.
- In other words, if the household air pollution is controlled, there will be a significant decrease in mortality including due to cardiovascular disease in India.

### What does the report imply?

- The risk burden of CVD-linked mortality is inversely proportional - lower risk but higher mortality in low-income countries, and higher risk but lower mortality in high-income countries.
- PURE's analysis concluded that the higher mortality in poorer countries was likely due to other factors.
- These primarily include 'lower quality and less health care'.
- Access to affordable, quality health care is still not ensured in many regions in India.
- A great amount of out-of-pocket expenditure frustrates continuation of treatment, or adherence to drug routine.
- According to Health Ministry data for 2014-15, nearly 62.6% of India's total health expenditure is out-of-pocket expenditure.

Top 10 risk factors for cardiovascular disease in low-income countries, by population-attributable fractions

Hypertension	14.3
High non-HDL cholesterol	14.2
Household air pollution	12.0
Diabetes	10.4
Poor diet	10.0
Abdominal obesity	7.0
Low education	6.0
Tobacco use	4.5
Low physical activity	2.2
Excess alcohol	2.0

Top 10 risk factors for death in low-income countries, by population-attributable fractions

Poor diet	19.2
Low education	13.7
Low grip strength	10.9
Household air pollution	9.0
Tobacco use	7.6
Diabetes	6.7
Hypertension	5.6
Low physical activity	2.7
Depression	1.9
Excess alcohol	1.8

### What is the way forward?

- Targeting risk factors is key to reducing deaths due to cardiovascular diseases.
- The major focus so far has been ambient air pollution i.e. pollution rising from motor vehicles and industries.
- It is now time to wake up and realise that the pollution generated in house is also responsible for significant adverse effects.
- Besides, the Centre's Ayushman Bharat Yojana will have to take much of the burden of hospitalisation for complications of non-communicable diseases.
- National and State schemes running on mission mode will have to step up efforts to target people at risk with life-saving interventions.
- These include the National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke.
- Any plans targeting the risk factors of non-communicable diseases will have to be truly game-changing, and incorporate the environmental angle as well.

## 5.3 Vaccine Hesitancy - Measles Spread

### What is the issue?

- There was a 30% increase in measles cases worldwide in 2018.
- Given this, overcoming 'vaccine hesitancy' is crucial to reduce the global spread of measles infection.

### What is measles?

- Measles is a highly contagious viral disease.
- It is transmitted via droplets from the nose, mouth or throat of infected persons.
- Initial symptoms, which usually appear 10-12 days after infection, include high fever, a runny nose, bloodshot eyes, and tiny white spots on the inside of the mouth.
- Several days later, a rash develops, starting on the face and upper neck and gradually spreading downwards.

- It remains an important cause of death among young children globally, despite the availability of a safe and effective vaccine.

#### **How significant is vaccine?**

- Under the Global Vaccine Action Plan, measles and rubella are targeted for elimination in five WHO Regions by 2020.
- Measles viruses kill immune cells, leaving the child vulnerable to infectious diseases for two to three years.
- So, measles vaccine not only provides lifelong protection against the virus but also reduces mortality from other childhood infections.

#### **What is vaccine hesitancy?**

- Vaccine hesitancy is defined as the reluctance or refusal to vaccinate despite the availability of vaccines.
- The threat from vaccine hesitancy appears to have grown more dangerous to public health.
- With rise in measles cases in 2018, the WHO, in January 2019, included 'vaccine hesitancy' as one of the 10 threats to global health in 2019.

#### **How is measles prevalence at present?**

- After a surge in measles cases in 2018, there have been around 3,65,000 measles cases reported from 182 countries in the first 6 months of 2019.
- The biggest increase, of 900% in the first 6 months of 2019 compared with the same period last year, has been from the WHO African region.
- (The Democratic Republic of the Congo, Madagascar and Nigeria accounted for most cases.)
- There has been a sharp increase in the WHO European region too, with 90,000 cases being recorded in the same period.
- This was more than the numbers recorded for the whole of 2018.
- The infection spread in the European region has been unprecedented in recent years.
- Recently, the U.K., Greece, the Czech Republic and Albania lost their measles elimination status.

#### **How is vaccine confidence in Europe?**

- A 2018 report on vaccine confidence among the European Union member states gives insights into the reasons for less vaccine coverage.
- It shows why vaccine coverage has not been increasing in the European region to reach over 90% to offer protection even to those not vaccinated.
- There, younger people (18-34 years) and those with less education are less likely to agree that the measles, mumps, and rubella (MMR) vaccine is safe.
- Only 52% respondents from 28 EU member states agree that vaccines are definitely effective in preventing diseases; a 33% felt they were probably effective.
- More alarming is that 48% of the respondents believed that vaccines cause serious side effects.
- 38% of them think vaccines actually cause the disease that they are supposed to protect against.

#### **What is the case with India?**

- 45% of children missed different vaccinations in 121 Indian districts that have higher rates of unimmunised children.

- A 2018 study found low awareness to be the main reason for this.
- While 24% did not get vaccinated due to apprehension about adverse effects, 11% were reluctant to get immunised for reasons other than this.

#### What lies ahead?

- Much work remains to be done to address misinformation.
- Social media plays a crucial role in spreading vaccine misinformation.
- A commitment by Facebook to reduce distribution of vaccine misinformation can go a long way in addressing vaccine hesitancy.

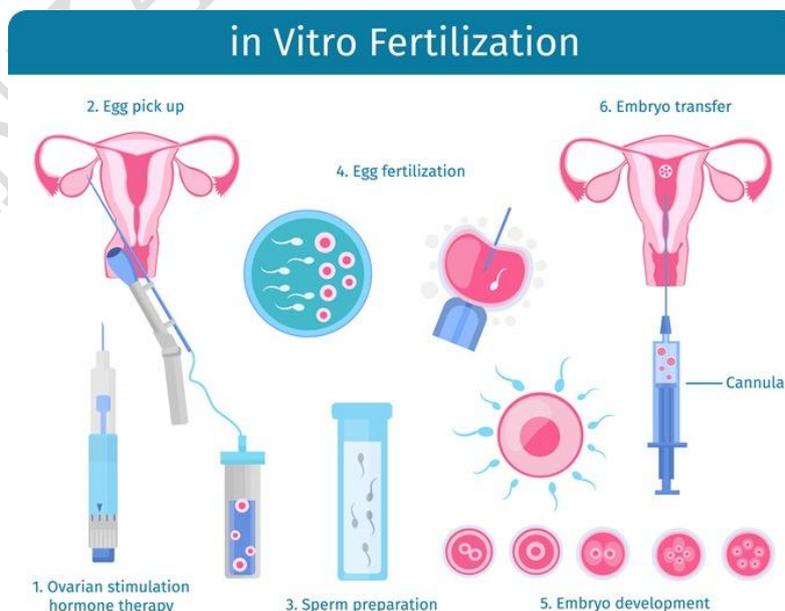
### 5.4 Pregnancy in Old Age - Risks and Legal Shortcomings

#### What is the issue?

- A 74-year-old woman from Andhra Pradesh was recently recorded as the oldest in the world to give birth to twins through in-vitro fertilisation (IVF).
- While babies and mother are stable, the medical community has expressed ethical and medical concerns over conception at such an advanced age.

#### What are the recent notable IVF births?

- Under IVF, the male's sperm is fertilised with a donor's eggs and placed in the woman's uterus (mother).
- Erramatti Mangayamma, 74, visited Ahalya Nursing Home in 2018 after 57 years of marriage and multiple failed attempts to conceive.
- With an IVF expert at that clinic, she conceived with in-vitro fertilisation technique.
- She recently delivered twin babies through a caesarean procedure.
- In 2016, Dajinder Kaur, 70, had delivered a boy through IVF in Haryana.
- At the same Haryana clinic, a 66-year-old woman had delivered triplets in 2010.





### Why is this a concern?

- Internationally this pregnancy is being condemned as things could have gone wrong and it sets a wrong precedent.
- Several experts have demanded punitive action, saying the Indian Council of Medical Research (ICMR) should deregister the doctor's Andhra Pradesh centre.
- ICMR is considering issuing a notice to the clinic for indulging in an unethical practice.
- **Concerns** - The average life expectancy of an Indian woman is 70 and of a man, 69.
- So, the medical community has expressed concerns over future of children born to such an elderly couple.
- [Notably, the very day after the delivery, the twins' father, 80, suffered a stroke.]
- Medical technology has reached a stage in which even a 90-year-old can conceive a baby.
- But, there are complications that can risk human life in this.
- The womb of an older woman has to be prepared by injecting hormones for the foetus to grow for nine months.
- Also, a woman of that age cannot breastfeed.
- Pregnancy in old age also poses multiple risks such as hypertension, diabetes, convulsions, bleeding, and cardiac complications.

### What is the current practice?

- The Assisted Reproductive Technologies (Regulation) Bill, 2010 proposes the upper age limit at 45 for women and 50 for men to undergo the IVF procedure; the bill is pending.
- Since the Bill on ART has not been passed yet, legal action against the clinics is impossible.
- With no law in place, the assisted reproductive technology (ART) industry continues to operate in a grey zone.
- As of now, several centres rely on ICMR's 2017 guidelines that recommend the same age limits.
- Even for adoption, the total age of the couple must not exceed 110 years.
- With increasing life expectancy, doctors are in talks with the government to increase the IVF age limit to 50-52 years for women.
- Now, several experts self-regulate, some counsel senior citizens to drop the idea, and others refuse them IVF treatment.
- **Other countries** - Most countries that have a law, range the upper limit for IVF between 40 and 50 years.
- In the US, the upper limit for IVF is 50, and for ovum donation, 45.
- In Australia, guidelines prohibit IVF beyond menopause (52 years).

### What necessitates old age pregnancy?

- Globally, an estimated 15% of couples are infertile.
- Societal pressure to have children, the fear of living without support in old age, and the loss of an only child often encourage couples to go for advanced treatments even at old age.
- The Assisted Reproductive Technologies (Regulation) Bill, 2010 too states that in the Indian social context, children are "old-age insurance".



- Some doctors argue that childbirth is a personal decision and each individual has the right to make that choice after counseling.

**Related News:** [Surrogacy Bill](#)

## 6. INDIA & ITS NEIGHBORHOOD

### 6.1 India-Pakistan Trade Tensions

#### What is the issue?

The India-Pakistan face-off in the recent period is having more repercussions than intended, with border economies the worst hit.

#### What is the recent trade unrest?

- In February 2019, in the wake of the [Pulwama attack](#), India decided to withdraw the [Most Favoured Nation \(MFN\)](#) status to Pakistan.
- Subsequently, it imposed 200% customs duty on all Pakistani goods coming into India.
- After the [Balakot airstrikes](#), again, India and Pakistan closed their airspace, with Pakistan keeping the ban in place for nearly 5 months.
- In April 2019, India [suspended trade](#) across the Line of Control in J&K, citing misuse of the trade route by Pakistan-based elements.
- More recently, post the Jammu and Kashmir Reorganisation Bill, Pakistan [cut off diplomatic and economic ties](#) with India.
- It expelled the Indian envoy, partially shutting airspace and suspending bilateral trade.

#### What was the impact?

- The impact of the escalating tensions has trickled down to trade relations between both the countries, much severe this time.
- In 2018-19, bilateral trade between India and Pakistan was valued at \$2.5 billion.
- In this period, India's exports to Pakistan accounted for \$2.06 billion and imports from Pakistan were at \$495 million.
- India's decision in regards with withdrawal of MFN status and imposition of 200% duty has hurt Pakistan's exports to India.
- The exports fell from an average of \$45 million per month in 2018 to \$2.5 million per month in the last 4 months.
- With Pakistan deciding to completely suspend bilateral trade, cotton exports from India to Pakistan might get affected the most, eventually hurting Pakistan's textiles.
- In all, the trade tensions have led to loss on both sides.

#### What is the larger implication?

- Unlike national economies, border economies owe their existence to cross-border economic opportunities.
- These economies generally experience sudden ups and downs on account of political changes, trade bans, price and exchange rate, and tax fluctuations.
- E.g. Amritsar (where major economic activity is largely dependent on border trade with Pakistan)
- Amritsar is land-locked, and is not a metropolis and traditionally has no significant industry.
- Hence, any decision on India-Pakistan trade has a direct impact on the local economy and the people of Amritsar.
- Since February 2019, estimatedly, 5,000 families have been directly affected in Amritsar because of breadwinner dependence on bilateral trade.

### What lies ahead?

- In all, the overall economies of the two countries may very well manage to stay afloat despite the suspension of economic ties.
- However, it is the local economies that will suffer the most and are already perishing.
- In this connection, there has been a loss in business, rise in prices, lack of alternative sources of livelihood, and an expected increase in bank defaults.
- Alternative sources of livelihood that can be generated to keep border economies afloat should be found with high priority.

## 6.2 India-Nepal Pipeline

### Why in News?

Prime Minister Narendra Modi and his Nepalese counterpart K P Sharma Oli will inaugurate the Motihari-Amalekhgunj petroleum pipeline.

### Where does the pipeline begin and end?

- The pipeline will transport fuel from Barauni refinery in Bihar's Begusarai district to Amalekhgunj in South-eastern Nepal, situated across the border from Raxaul in East Champaran district.
- According to the spokesperson of Nepal Oil Corporation (NOC), the 69-km pipeline will drastically reduce the cost of transporting fuel to landlocked Nepal from India.
- The Amalekhgunj fuel depot will have the capacity to store up to 16,000 kilolitres of petroleum products.

### When it all did begin?

- The Motihari-Amalekhgunj pipeline project was first proposed in 1996, but progress was slow.
- Things began to move after Prime Minister Narendra Modi visited Kathmandu in 2014.
- The following year, the two governments signed an agreement to execute the project.
- However, political tensions, including India's alleged economic blockade of Nepal, acted as roadblocks in the implementation.
- In 2017, state-owned Indian Oil Corporation (IOC) signed a petroleum trade agreement to supply about 1.3 million tonnes of fuel annually to Nepal with a promise to double the volume by 2020.
- In July 2019, the two countries successfully concluded a testing transfer through the oil pipeline.

### What are the costs and benefits?

- The project was initially estimated to cost Rs 275 crore, of which India was to bear Rs 200 crore.
- Subsequently, the NOC said the total project cost had escalated to almost Rs 325 crore.
- Commercial operation of the cross-border fuel project will bring down fuel price by at least one rupee per litre said the NOC Deputy Executive Director.
- The pipeline will help in tackling the oil storage problem in Nepal and doing away with transportation of petroleum products through tankers.
- It will ensure smooth, cost-effective and environment-friendly supply of petroleum products to Nepal.

## 7. BILATERAL RELATIONS

### 7.1 Apology of Archbishop of Canterbury

#### What is the issue?

- Many leaders from the United Kingdom (UK) tip-toed around giving a formal apology for the Jallianwala Bagh massacre in the past few years.

- The current Archbishop of Canterbury has spoken on the matter as he paid a visit to the Jallianwala Bagh memorial in Amritsar.

### What happened now?

- The current Archbishop of Canterbury said that he was “ashamed and sorry for the massacre”.
- He further added that he could not speak on behalf of the British government since he is a religious leader and not a politician.
- The reason why the UK hasn’t apologised till now is that admitting blame could have legal and financial consequences.
- While a formal apology may be seen as an embarrassment for the UK in perpetuity, it could, at least in a court of law, imply admitting liability.

### What is the story behind Jallianwala Bagh Massacre?

- The massacre took place on April 13, 1919, the day of Baisakhi, a festival observed in Punjab to mark the beginning of the harvest season.
- On this day, a group of unarmed civilians gathered at Jallianwala Bagh were fired at by British troops on the order of Brigadier-General Reginald Dyer.
- Over 400 were killed as a result which included children as well.

### What is the history of reluctance in accepting blame?

- **Former British Prime Minister David Cameron** on his visit to India in February 2013 had described the Jallianwala Bagh massacre as a “deeply shameful event in British history”.
- Cameron also invoked then secretary of state for war Winston Churchill, who in 1920 referred to the killings as monstrous.
- Even though he did not make a formal apology, Cameron’s remarks were in contrast to what **Queen Elizabeth II and her husband Prince Phillip** had said during their visit to the site in 1997.
- The Queen called it a distressing episode while the Prince questioned the credentials of the massacre saying that the incident was exaggerated.
- Even so, Cameron stopped short of making a formal apology when he visited the massacre site, the only British prime minister at that time to do so in the 94 years since the incident occurred in 1919.
- In November 2016, Shashi Tharoor had demanded an apology for the massacre to be delivered as part of the UK’s reparations to India for the colonial exploitation by the British.
- In December 2017, after his visit to Amritsar, **London Mayor Sadiq Khan** had called for an apology from Britain for the massacre.
- After this, the UK Foreign Office released a statement that rightly condemned the deeply shameful act.
- During this time, veteran UK-Indian MP Virendra Sharma who was a member of the Labour Party at that time, revived his petition launched on the UK parliament’s website earlier in 2017 calling for an apology.
- This year, the demand for an apology was revived since the year marks the centenary of the incident.
- In April 2019, **former Prime Minister Theresa May** expressed “regret” but did not deliver an absolute apology.
- A day after May’s remarks, a Pakistani minister endorsed the demand saying that the British empire must apologise to the nations of Pakistan, India and Bangladesh on Jallianwala Bagh Massacre and Bengal famine.

### What makes the Archbishop’s apology significant?

- The Archbishop of Canterbury serves as the head of the Church of England, which is a position that goes back almost 1400 years.
- Two archbishops preside over the Church of England, one is the archbishop of the province of Canterbury and the other is the archbishop of the province of York.
- The kings and queens of England are crowned by the former and he is ranked just after the princes of royal blood.



- He is also regarded as the spiritual leader of the Anglican Communion of churches and is referred to as the “primate of all England”.
- Justin Welby holds this position since the year 2013. The Anglican Communion is spread all over the world, with over 85 million members.

**Related News - [Statesmanship on Paying Homage](#)**

## 7.2 India-U.S. trade deal

### Why in news?

- India and the US failed to arrive at a limited trade deal during Indian PM visit to the U.S.

### What is the expected “limited” trade deal?

- The trade deal was faltered over duties imposed by India on ICT products.
- The U.S. wanted the 20% duty on mobile phones and ethernet switches to be reduced or eliminated.
- U.S. also demanded greater access to the Indian market for medical devices such as stents and knee implants apart from its dairy and agricultural products.
- For its part, India wanted the Generalised System of Preferences which gives preferential market access for its products in the U.S., restored.

### Why the trade deal couldn't be finalised?

- **India** - U.S's demands in medical devices and dairy & agricultural products are seen as sensitive products politically for the India.
- As the government has often taken credit for making those products affordable.
- Loosening price controls now is not an option for India as that would push up prices of these products in the country.
- A full-scale trade agreement would pose bigger challenges on issues such as intellectual property, e-commerce and H1B visas.
- With its economy in the grip of a major slowdown, any concessions from India on imports of American products may not have gone down well both politically and in economic terms.
- **U.S.** - For U.S. President Trump, even a limited deal with India will be something to talk about as he approaches election year.
- This is especially because trade talks with China are going nowhere.
- China has not only taken punitive tariffs by the U.S but also retaliated by picking the products that could hurt Trump's constituency and supporters.
- This explains the hectic, behind-the-scenes activity with India in the last few weeks.
- Going by the limited information in the public domain, it appears that India has played tough and refused to yield to U.S. demands.
- Trade negotiations are never easy and for them to succeed, both sides have to believe in a policy of give and take.
- It does not help if one side tries to bulldoze the other into submitting totally to its interests.
- At this point in time it does seem that even a limited trade deal between India and the U.S. is some distance away.

## 8. INTERNATIONAL ISSUES

### 8.1 Withdrawal of Hong Kong's Extradition Bill

#### Why in news?

The [Hong Kong's extradition Bill](#) was withdrawn following the widespread protests over the controversial provisions.

#### What is the immediate effect?

- The extradition Bill was essentially intended to hand over suspected criminal offenders to other jurisdictions.
- The withdrawal of the Bill has raised hopes for a welcome, even if temporary, pause in tensions.
- The reversal has given Beijing time to deal with the political and economic fallout from the intensifying protests.
- Notably, China had begun mobilising paramilitary forces in neighbouring Shenzhen city.

#### What are the protestors' demands?

- The decision by Carrie Lam, the Hong Kong's Chief Executive, has given a boost to the pro-democracy campaign being referred to as the 'Water Revolution'.
- Ms. Lam was uncertain and so delayed a decision for nearly 3 months.
- Meanwhile, the protestors expanded their charter of demands, in effect to question the 'One Country, Two Systems' policy of Hong Kong.
- They have called for a judicial investigation into the government's handling of the crisis and alleged police violence.
- The demand is bound to grow louder after the roll-back of the Bill.
- But the most potent of the demands is the right to universal suffrage.
- The demand was originally championed under Hong Kong's 2014 umbrella movement, but effectively made ineffective by the government.
- The demand will certainly prove pivotal to the current campaign.

#### What could the implications be?

- China's President Xi Jinping would be aware of the implications of major loosening of policy as the 2047 expiry of Hong Kong's special status approaches.
- The risks involved are more likely to reflect in Taiwan too, whose government is particular of independence from China.
- [Taiwan is a sovereign state but its sovereignty is highly contended, and it has a tense relationship with China).

#### How does the future look?

- The 'Water Revolution' has so far managed to broaden its appeal among millions, transcending social classes and across different generations.
- As with other recent political uprisings, building a cohesive leadership and strategy might turn out to be its biggest challenge.
- In a sign of the unstable economic and business environment ahead, Hong Kong's GDP growth in the previous quarter was the slowest since the financial crisis.
- Given its position as Asia's leading financial hub, prolonged uncertainty in Hong Kong can worsen the global implications of the current U.S.-China trade tensions.
- Mr. Xi has embarked on an aggressive policy aimed at China's economic, technological and strategic dominance.
- However, given the immediate challenge posed by the current discontent, an accommodative policy by China might serve the best overall interest.



## 8.2 Division between the EU and the U.S. - Iran's Crisis

### What is the issue?

With US, under Trump, abandoning the nuclear deal with Iran, the division between the EU and the U.S. over Iran is becoming a pressing security challenge.

### What is the situation now?

- Following the U.S.'s move, Iran has deliberately violated its terms by producing more low-enriched uranium than the agreement permits.
- The European nations seem worried about a growing list of violations of the deal by Iran.
- Iran recently seized a U.K.-flagged tanker in the Strait of Hormuz.
- But despite all these, they want to preserve the deal (JCPOA - the [Joint Comprehensive Plan of Action](#)).
- The Iran crisis reflects the strains between the U.S. and Europe over the U.S. President's maximalist political approaches.

### What are the key differences?

- The major reason is that Europe needs to keep the Persian Gulf open to guarantee the flow of oil and ensure its economic security.
- However, on this issue, France and Germany have refused to join the American plan called "Project Sentinel."
- [This aims to protect ships passing through the Strait of Hormuz.]
- Moreover, the Europeans are fearful of getting involved in another war in West Asia.
- In fact, they do not trust that Mr. Trump would keep his word and that he would not attack Iran.
- Also, the Europeans have been trying to find ways for their businesses to avoid the effects of American sanctions on Iran.
- France, Germany and the U.K. have developed a mechanism to trade with Iran legally using a trading system known as INSTEX (Instrument in Support of Trade Exchanges).
- It has been designed to permit countries to trade with Iran without the use of American dollars, so as to avoid the U.S. financial system.
- For many European companies, the risk of facing sanctions because of trade with Iran is more.
- It outweighs any gain from trading with the Islamic Republic and more specifically the Islamic Revolutionary Guard Corps (IRGC) which is targeted by the U.S. as a terrorist organisation.
- America's allies are wary of Trump's administration's intentions to provoke a war with Iran no matter what the consequences are for the rest of the world.
- Evidently, no European country wants to trigger a military confrontation with Iran.
- This is because it would draw in other regional states and non-state actors.

### How does the future look?

- European powers could play a major role in ending U.S.-led economic warfare against Iran.
- They could contribute to building a more effective diplomatic process in West Asia.
- However, the reality is that at this time the situation is at a deadlock.
- It is high time that the Trump administration will need to make decisions given the costly setbacks that some of its recent policies have seen.
- For the Iranian government, the most immediate priority is to ask for help from France and Germany in finding a way out of the current economic crash dive.
- This is crucial for containing public unrest and preventing social instability inside the country.
- But ultimately, Iran will need to show some signs of flexibility.
- By this, possibly, the arrangements arrived at in the nuclear deal could be enlarged and applied to other key issues.



### 8.3 Ending U.S.-Taliban Peace Talks

#### Why in news?

US President Donald Trump announced the cessation of [peace negotiations](#) with the Taliban, which was aimed at ending the 18-year war in Afghanistan.

#### What happened?

- The negotiations were over U.S. troop withdrawal from Afghanistan.
- The objective was to get assurances from the Taliban of not letting the country to be used as a safe haven for terrorists targeting the U.S.
- Mr Trump was about to host the Taliban as well as Afghan president Ashraf Ghani at the Camp David presidential retreat in Maryland for secret talks.
- In this backdrop, Trump's tweets seem to have indicated the end, at least for now, to the negotiations conducted by the chief U.S. negotiator, Zalmay Khalilzad, with the Taliban.
- Mr. Khalilzad had disclosed that he had reached an "in principle" agreement with the Taliban, but the details have not been revealed.
- The Taliban said the US would "lose the most" for cancelling talks.

#### What is the reason?

- The Taliban has been continually engaging in a series of attacks against civilians throughout the course of the talks.
- One estimate suggests that it has engaged in 173 terror attacks resulting in close to 1300 fatalities in 2019 alone.
- The Taliban has perversely used the attacks as a bargaining chip of sorts, to undermine the Afghanistan government.
- Mr. Trump said that a recent suicide car bomb attack in Kabul was the trigger for his sudden decision to end the talks.
- But little has changed in the Taliban's behaviour to immediately call-off the talks.
- So, this is seen as yet another instance when the U.S. President puts in personal diplomacy in the conduct of America's foreign affairs.

#### What lies ahead?

- Afghanistan continually witnesses violence, with the Taliban increasing its control over several provinces.
- The government's writ prevails only in the north-central parts of the country.
- Given this, a durable peace, with the U.S. seeking early troop withdrawal, is only possible if there are talks between all Afghan groups and other regional stakeholders.
- For this, a guarantee by the Taliban that it will give up terror is essential.
- Going forward, Mr. Trump must reveal the contents of the so-called "in principle" agreement.
- He should also set more meaningful terms of engagement involving the Afghan regime in any further talks with the Taliban.

**Related News:** [US-Taliban Peace Talks](#), [US-Taliban Peace Talks - II](#)

### 8.4 Saudi Oil Attacks

#### Why in news?

- A small army of drones attacked two major oil plants in Saudi Arabia, destroying nearly 50% of the country's global supply of crude.
- The Houthi militia fighting Yemen's Saudi Arabia-backed government in a four-year-long civil war claimed responsibility for the attacks.

## What happened?

- The attacks targeted the Saudi Aramco-owned Khurais oilfield and Abqaiq oil processing facility.
- [Khurais is the closest of the targets to the Yemen border, but is still a considerable 770km away.]
- US officials said there were 19 points of impact on the targets, which could have come from a mix of drones and cruise missiles.
- The Houthis have repeatedly launched rockets, missiles and drones at populated areas in Saudi Arabia.
- The attacks have left at least four civilians dead.
- The conflict in Yemen escalated in March 2015, when the Houthis took control of much of the west of the country and forced President Abdrabbuh Mansour Hadi to flee abroad. (Click [here](#) to know more)
- Soon after, Saudi Arabia and its allies launched an air campaign in a bid to restore Mr Hadi's government.



## What is the impact?

- The immediate impact of the attack has been the suspension of more than half of Saudi Arabia's daily crude oil output.
- It thereby affected the country's contribution to global oil supply.
- The Saudis have restored a portion of the supply that was hit.
- However, the sudden disruption resulted in the highest spike (nearly 20%) in Brent crude prices in more than a decade.
- Soon, the U.S. President's statement assured that America would release some of its strategic reserves.
- This resulted in the crude price easing back to \$66 per barrel.

## Who is responsible?

- The Houthi militia has claimed responsibility for the attacks.
- However, the U.S. has suggested that Iran was responsible for the attacks.
- The US has reportedly identified locations in Iran from which drones and cruise missiles were launched against major Saudi oil facilities.
- The locations were in southern Iran, at the northern end of the Gulf.
- Mr. Trump suggested that he was still trying to draw the Iranians to make a deal over their nuclear programme.



- Iran's response has been to dismiss the allegations accompanied by a refusal to talk on the U.S.'s terms.
- In all, the sudden disruption of global crude oil supply is the unintended consequence of -
  - i. the unraveling of the painstakingly crafted P5+1+EU-Iran [nuclear deal](#)
  - ii. the Saudis' reckless adventure in Yemen
  - iii. the Iranian empowerment of its proxies in West Asia

#### **What is Saudi's priority now?**

- The Saudis must halt their Yemen intervention and leave it to the UN to broker peace in the disturbed country.
- The Saudi-led military campaign, with logistics support from the U.S. and the U.K., has only brought a stalemate in Yemen.
- It has escalated the conflict to include energy supply targets that were considered secure.

#### **What is the possible impact on India?**

- The above turn of events is bound to affect several emerging economies, including India.
- The Union Petroleum Ministry has sought to allay fears of a supply cut with assurance from Aramco officials.
- However, there is already an indication that crude prices would rise further due to an increase in the risk premium.
- Notably, India imports more than two-thirds of its oil from West Asia.
- So, a price surge is expected to impact the current account and result in further currency depreciation.
- Higher fuel costs and the imported inflation could also hurt the consumer at a time of a slowdown in the economy.
- Given these, the government should be prepared to handle the challenge with steps such as re-evaluating the excise duties on petroleum products.

## **9. ECONOMY**

### **9.1 India's Nearing Stall**

#### **What is the issue?**

India's deepening slowdown has now left the economy on the verge of stalling.

#### **What are some major facts?**

- The latest GDP estimates show year-on-year growth in the April-June period slid to 5%, the slowest pace in more than six years.
- The private consumption spending slumped to an 18-quarter low, with the expansion decelerating sharply to 3.1%, from 7.2% in the preceding quarter and 7.3% a year earlier.
- Gross fixed capital formation (GFCF), a proxy for investment activity, grew only a 4% which is less than 13.3% growth it posted a year ago.

#### **What did the RBI's annual report reveal?**

- Indicators of GFCF had shown either moderation or contraction in the fiscal first quarter.
- It pointed specifically to gross value added (GVA) by the construction industry, which government data revealed had eased to a 5.7% pace, from 9.6% in the year-earlier period.
- With demand for manufactured products ranging from cars and consumer durables to biscuits having sharply diminished, manufacturing GVA growth plunged to an eight-quarter low of 0.6%.
- In fact, save mining, electricity and other utility services and public administration and defence, all the five other contributors to overall GVA weakened from a year earlier.

- RBI observed in its July 2019 survey that the consumer confidence has worsened appreciably with 63.8% of respondents expecting discretionary spending to stay at the same level or shrink one year ahead.
- The comparable reading in June 2018 was 37.3%.

### **What are, and could be the actions of the government?**

- The government is cognisant of the gravity of the situation which is evident from its recent slew of policy pronouncements.
- It tweaks the investment norms to draw more Foreign Direct Investment (FDI), moves to relieve the debilitating sales slump in the auto sector and a sweeping consolidation of public banks.
- Any beneficial impact from these measures will take time to feed into the economy.
- Time is a luxury that the faltering economy can ill afford, especially given the global headwinds.
- With the farm sector still stuck in a low income trap and this year's monsoon rains leaving some parts flooded and others deficit, rural demand is unlikely to return any time soon.
- The RBI's four interest rate reductions since the start of 2019, failed to incentivise credit-fuelled consumer spending and business investment to any significant degree.
- With limited fiscal headroom to try and prime the pump with increased expenditure, big, bold structural reforms may be the only way out.
- The government must lose no time in consulting with the widest possible spectrum, including the Opposition, and then implement the agreed-on reforms prescriptions to reinvigorate demand and investment.

### **Single-brand retail: Relaxing FDI norms**

#### **Why in News?**

The government has proposed to relax conditions for foreign direct investment (FDI) in 4 sectors, including single-brand retail. To know more, [click here](#).

#### **Why are these reforms welcomed?**

- The Centre's plan to relax the mandatory 30% local sourcing norm is of particular importance, as it was cited as one of the major stumbling blocks for the firms to enter India's retail market.
- The new rules call for calculating the 30% as a 5-year average to begin with. [The present system of considering local sourcing targets on a year-on-year basis].
- After the first 5 years, the local norm will apply on an annual basis.
- This change will provide foreign retailers some transition time, allowing them to adjust to local conditions and make financial adjustments.
- Single-brand retailers were mandated to source 30% locally every year if their FDI crossed 51%, even though 100% FDI is allowed in the sector.
- The new norms also say that a foreign retailer's export purchases from India would also be counted towards the mandatory 30%.
- Companies can source goods from India for global use directly or via group entities in India or abroad, or indirectly through a third party.

#### **What will happen if the proposed norms are operationalized?**

- The sector will get a boost now, since the window for local outsourcing has opened up a bit.
- Most single-brand retail companies can start online retailing before setting up a physical store in the country, something that was not allowed earlier.
- While it may still be difficult for players like Apple to set up shop in India, several other players, like furniture-maker Ikea and cellphone brands, could benefit from the new norms and start online stores.
- The new norms could help bring more FDI into the sector and boost local manufacturing as well as exports.
- India's integration with global value chains will improve, benefiting MSMEs that have struggled for market access.



### **Why these reforms in single-brand retail are still an unfinished affair?**

- The Centre should stop micromanaging the retail sector through curbs on legitimate competitive practices.
- It should review its restrictions on marketing practices in e-commerce.
- Marketplace entities won't be able to buy more than 25% from a single vendor or sell the goods of the companies in which the marketplace entity holds a stake.
- This would target the so-called foreign e-tailers at a time when distinctions between foreign and domestic companies have become increasingly hard to make.
- After all, the opening up of the retail space so far has not driven small stores to the wall, as was predicted by sceptics.
- To set terms for foreign investors is all very well, but not at the expense of throttling innovation.

### **9.2 RBI Circular on Lending Rate**

#### **Why in news?**

In a recent circular to banks, the RBI has directed lenders to link lending rate to external benchmark.

#### **What is the rationale?**

- The benefits of changes made by the RBI to the policy repo rate (rate at which RBI lends to commercial banks) is often not transmitted to the borrowers by the banks.
- In 2015, then RBI Governor Raghuram Rajan decided that the system used by banks to price their loans needed to be changed.
- So, he introduced the Marginal Cost of Funds based Lending Rate (MCLR) regime.
- In October 2017, an internal study group of the RBI recommended the adoption of [external benchmarks](#) to ensure effective policy transmission.
- This came after observing that the MCLR too had failed to deliver.
- Notably, RBI made a total of 75 basis points (bps) reduction in the repo rate between February and June 2019.
- Against this, the weighted average lending rate on fresh rupee loans at banks eased only by 29 bps.
- The current RBI move comes as an effort to address this problem of inadequate interest rate transmission.

#### **What is the order?**

- Lenders will have to link all new floating rate loans given in the personal, retail and MSME categories to external benchmarks, including the repo rate, with effect from October 1 2019.
- The banks are free to choose one of the several benchmarks:
  - i. RBI repo rate
  - ii. the 91-day T-bill yield
  - iii. the 182-day T-bill yield
  - iv. any other benchmark market interest rate produced by the Financial Benchmarks India Pvt. Ltd
- However, the RBI has made it clear that lenders would need to adopt a uniform benchmark within a particular loan category.
- Banks have also been given the leeway to determine their spread over the benchmark rate.
- This is however subject to the condition that changes to the credit risk premium can only be made when the borrower's credit assessment undergoes a substantial change.

#### **What lies ahead?**

- While the real economy needs some support, there has to be more transmission of rates happening at the first place.
- The latest move will surely lower the interest cost on new floating rate loans availed by borrowers to buy cars or homes.

- However, it may force banks to start cutting the interest rate they pay to deposit holders or risk seeing their margins shrink.
- The RBI's aim is to boost credit for the dull personal consumption and encourage borrowing by stressed MSMEs.
- But the real success of the measure will ultimately be determined by a regaining of confidence by consumers to spend and a conviction by industry to invest.

## Quick Facts

### Interest rate spread

- Spread refers to the difference in borrowing rates and lending rates of financial institutions.
- In other words, it is the interest yield on earning assets such as a loan minus interest rates paid on borrowed funds.

### T-Bill Rate

- Treasury Bills are government bonds or debt securities with maturity of less than a year.
- T-Bill Rates are determined by the central bank and used as a primary instrument for regulating money supply and raising funds.

## 9.3 Employment Scenario - Skilling India

### What is the issue?

India's present demographic scenario calls for increased focus on skill development as demography brings a dividend only if the youth is trained properly.

### What is India's current employment scenario?

- A minimum of 8 million new job seekers enter the jobs market every year.
- In 2017, only 5.5 million had been created, and the situation is worsening.
- Unemployment rate is the highest in 45 years now.
- The Indian youth has been affected the most, with the unemployment rate reaching 34% among the 20-24-year-olds in the first quarter of 2019.
- It stands close to 38% among the urban lot, according to the CMIE (Centre For Monitoring Indian Economy).
- According to the last 2018 Periodic Labour Force Survey (PLFS), the unemployment rate among the urban 15-29-year-olds was 23.7%.

### What causes this?

- Only 7% of the people surveyed in the framework of the PLFS declared any formal or informal training.
- So, it may possibly be understood that this all-encompassing joblessness was due to the poor training of the youth.
- However, this does not explain the whole picture.
- According to a recent survey, 48% of Indian employers reported difficulties filling job vacancies due to talent shortage.
- The worst affected sector has been Information Technology (IT) which is also one of the strong points of India's economy.
- In IT sector, 1,40,000 skilled techies could not be recruited in 2018 despite the employers' efforts; 5,00,000 job offers had been made that year.
- Indeed, the CMIE reports show that the more educated Indians are, the more likely they are to remain unemployed too.
- The last PLFS for 2018 revealed that 33% of the formally trained 15-29-year-olds were jobless.

### What was the government's skilling plan?

- The government assumed that the above problem was because the trained youth were not well-trained enough.
- Hence came the "Skill India" programme, to train a minimum of 300 million skilled people by the year 2022.
- In 2014, the Ministry of Skill Development and Entrepreneurship was created -
  1. to harmonise training processes, assessments, certification and outcomes
  2. to develop Industrial Training Institutions (ITIs), the building blocks of skill development
- More courses and institutes of vocational training were created.
- Besides this, the main innovation of "Skill India" consisted in integrating "vocational training classes linked to the local economy."
- This came with formal education from class nine onwards in at least 25% of the schools and in higher education bodies.
- A very important aspect of Skill India was its PPP (Public-Private Partnership) character.
- Companies were requested to earmark 2% of their payroll bill (including for contract labour) for skill development initiatives.
- In parallel, the ITIs were supposed to tie up with industry in the relevant trades to improve placement opportunities for candidates.
- One of the most innovative dimensions of Skill India was the Pradhan Mantri Kaushal Vikas Yojana (PMKVY).
- Under this, the training fee was paid by the government.
- [The PMKVY's budget was approximately Rs 12,000 crore for 4 years (2016-2020).
- Its main tool was the "short-term training", which could last between 150 and 300 hours.
- It included some placement assistance by Training Partners upon successful completion of their assessment by the candidates.]

### How effective were the measures?

- Against the target of reaching out to 300 million young people by 2022, only a mere 25 million had been trained under Skill India by the end of 2018.
- It was partly due to mismanagement and partly due to the fact that funds available were either not spent sufficiently quickly or too little was spent.
- Notably, in 2018, only 16% of the youth who had received formal training were funded by the government.
- The real problem is that those who have been trained do not find jobs.
- The number of those who have benefited from the Skill India scheme has increased, from 3,50,000 in 2016-17 to 1.6 million in 2017-18.
- But, the percentage of those who could find a job upon completion of their training has dropped from more than 50% to 30%.
- Under PMKVY, 4.13 million people had been trained, but only 6,15,000 (15%) of them got a job.

### What were the flaws in the approach?

- Firstly, the training was not good enough, and this is primarily why the employability rate remains very low.
- Secondly, the government expected that some of the PMKVY-trainees would create their own enterprise.
- But only 24% of the 6,15,000 mentioned above started their business. Out of these, only 10,000 applied for MUDRA loans.
- Thirdly, India's joblessness issue is not only a skills problem.
- It is also representative of the lack of appetite of industrialists and SMEs for recruiting.
- The decline of the investment rate is a clear indication that the demand is weak.

## 9.4 Corporate Tax Rate Cut

### Why in news?

Finance Minister announced the slashing of corporate tax rate to 22% from 30%; an ordinance in this regard has already been issued by the government.

### Why is this notable?

- This big cut (more than a fourth) in corporate tax rate comes after a gap of almost 15 years.
- In 2004-05, the tax rate was reduced to 30% from 35% (one-seventh).
- This was 7 years after it was brought down to 35% from 40% (one-eighth).
- Now, it has been slashed from 30% to 22%.
- Also, for companies that are incorporated after October 1 and whose projects will be commissioned before March 31, 2023, the tax rate will be as low as 15% (compared to 25% currently).
- The effective tax rate for this category of companies will be 17.01%, about 12 percentage points lower than what prevails now.
- [The effective tax rate for a corporation is the average rate at which its pre-tax profits are taxed.]

### What is the effect?

- The tax rate cut does the following:
  1. it increases the profitability of companies in India, leaving them with extra cash to invest; restrains them from demanding more sops, putting pressure on them to invest
  2. it creates a feel-good sentiment, and sends a strong message about the government's faith in India Inc (the formal sector - government & corporate)
  3. it puts pressure on the fiscal position of the Centre

### What are the implications for the states?

- The annual cost of this corporate tax rate cut, which no government will be able to restore, is Rs 1,45,000 crore, almost 1% of the GDP.
- States do not have a choice, but to face the impact of this.
- 42% of Union taxes is devolved to the states; so, they will receive almost Rs 61,000 crore less from the Central government now.
- Consequently, they will have little fiscal space to expand spending programmes.

### What are the concerns?

- **Drawbacks** - The move will certainly help companies address the imbalance in their balance sheets.
- However, these measures do not address the structural issues that need much attention.
- [The government, so far, has been overusing cyclical tools of fiscal and monetary policy to reverse the economic slowdown.]
- Nor do they seriously address the immediate problems of demand revival and weak private investment.
- Because, the move may not significantly boost the private investment in the short run, which has remained dull for almost 7 years now.
- **Fiscal** - The move is certainly good for the economy in the medium term.
- However, in the short term, until revenues bounce back, the government has a fiscal problem on its hands.
- The move is significant in the context of the over-estimation of revenues in the Budget and the under-performance in terms of tax collections so far in 2019-20.
- The 2019-20 Budget assumes net tax revenues of Rs. 16.49 lakh crore.
- This is a rather ambitious 25% growth estimate over the actual revenues of Rs. 13.16 lakh crore in 2018-19.

- If the revenue foregone now is weighed against this unrealistic Budget target, the outlook for the projected deficit this year is worrying.
- Given these, the deficit target of 3.3% for this fiscal is less likely to be attained.
- The [bounty of Rs. 1.75 lakh crore](#) received from the RBI as dividend is obviously an advantage, and it is this money that the government has now given away.
- But, if the fiscal deficit target is to be met, then the gap from the original over-estimation of revenues has to be bridged.

#### What are the other possible options?

- Higher infrastructure spending could have been done as this has a better multiplier effect.
- The indirect taxes could have been cut sharply, which would give many, the benefit of lower prices.
- Besides these, the structural issues that need to be addressed are land and labour reforms.
- Sorting out the issues related to availability of land and price of land is crucial to achieve the real benefits of giving more money to corporates.
- Also, products and services affordable to middle and lower income people should be given due attention.
- India has been predominantly a consumption-driven economy; but, for sustainable growth, private sector must start investing.
- In all, the two pillars of sustainable growth now are consumption and private investment.

### 9.5 RBI's Moves on Punjab and Maharashtra Cooperative Bank

#### Why in news?

- The RBI has slapped restrictions on Punjab and Maharashtra Cooperative Bank Ltd (PMC Bank).
- It has also appointed an administrator and superseded its board of directors.

#### What are the implications of the decision?

- The PMC bank is a leading urban cooperative bank headquartered in Mumbai.
- The decision sent shock waves among thousands of its depositors.
- Panic-stricken customers rushed to bank's branches across the state and were unable to withdraw more than Rs 1,000.
- The Bank has a deposit base of Rs 11,617 crore and operations across 7 states.
- It has been put under the scanner by the RBI after "irregularities" were disclosed to RBI.
- It ranks among the top 10 cooperative banks in the country.
- Moreover, the RBI restrictions will remain in force for 6 months.
- Given these, the unrest among customers is likely to continue.

#### What went wrong?

- **Reporting** - With a deposit base of just over Rs 11,000 crore, PMC bank reported a net profit of Rs 99.69 crore in 2018-19 as against Rs 100.90 crore in 2017-18.
- The bank showed 3.76% (or Rs 315 crore) of advances (Rs 8,383 crore) as gross nonperforming assets (NPAs) in March 2019.
- This was a good performance considering that public sector banks recorded over 10% gross NPAs.
- But, it was learnt that the bank had suppressed the problematic assets and under-reported them.
- With this, the total bad loans could be between Rs 2,000-2,500 crore.
- Though this was not flagged in the Annual Report of 2018-19, the RBI was following it in the wake of huge divergence in bad loan reporting.



- **HDIL** - The bank was funding a clutch of companies, mainly in the troubled real estate sector, led by Housing Development & Infrastructure Ltd (HDIL).
- Rakesh Kumar Wadhawan is the Chairman of HDIL and his son Sarang Wadhawan is the Vice Chairman and MD.
- Notably, the Wadhawans of HDIL group had close links with PMC Bank for a long time.
- PMC had given loan to Wadhawan even after HDIL defaulted on its loans to other banks.
- Notably, commercial banks have already declared HDIL a defaulter.
- HDIL was also taken to National Company Law Tribunal (NCLT) for insolvency proceedings.
- Recently, NCLT admitted an insolvency plea moved by the Bank of India against HDIL in connection with a Rs 522-crore loan default.
- PMC, however, claimed that the loan was much lower than Rs 2,500 crore quoted in the media.
- The loans given to HDIL and other entities were suppressed by the PMC despite defaults.

## 9.6 Secondary Market for Corporate Loans - Manoharan Committee

### Why in news?

The task force set up by the RBI to examine the possibilities of a secondary market for corporate loans in India submitted its report recently.

### What is a secondary market?

- When a company issues its securities for the first time, it does it in the primary market.
- After the IPO (Initial Public Offering), those securities get available for trade in the secondary market.
- A secondary market is thus a marketplace where already issued securities (both shares and debt) can be bought and sold by the investors.
- It is a market where investors buy securities from other investors, and not from the issuing company.
- Equity shares, bonds, preference shares, treasury bills, debentures, etc. are some of the key products available in a secondary market.
- SEBI functions as the regulator for the secondary market.

### What are the key suggestions?

- The task force was led by Canara Bank Chairman T N Manoharan.
- It suggested creating a self-regulatory body (SRB) to manage the secondary market.
- This would develop appropriate benchmark rates for secondary market purchase and sale of corporate loans.
- The SRB is expected to also finalise detailed modalities and formulate guidelines.
- It would -
  - i. standardise the paperwork associated with loans, making them easier to trade
  - ii. maintain the standards and examine documentation
  - iii. maintain a central registry, and so on
- Aside from the creation of this quasi-regulator, the committee also suggested that existing requirements be changed.
- It said the secondary market for corporate loans, currently dominated by banks, be thrown open to mutual funds, pension funds, and insurance companies.
- To start with, it was recommended that term loans be prioritized for sale in the secondary market.
- Subsequently, depending upon the experience gained, other categories of loans like revolving credit facilities should follow suit.
- These include cash credit, credit card receivables, assets with bullet repayment and non-fund based facilities.



### What is the committee's rationale?

- The secondary loan market in India is largely restricted to sale to Asset Reconstruction Companies and ad-hoc sale to other lenders, including banks.
- Notably, no formalised mechanism has been developed to deepen the market.
- Banks and NBFCs are currently the only participants in the primary and secondary loan markets.
- So, the taskforce felt that it was essential to widen the spectrum of participants to boost the secondary market.
- Besides, the secondary market in corporate debt is so illiquid.
- In the absence of sufficient liquidity, the market is not properly passing the price information about companies.
- So, a more structured form of price discovery would be far more efficient.

## 10. INFRASTRUCTURE

### 10.1 PPP model, States Role in Highways Construction

#### What is the issue?

- Contrary to general perception, State highways are of better quality, less cost and are built faster than national highways.
- In understanding this, here is a look on different modes of road construction and the advantages that State Highways have.

#### What are the different modes of road construction?

- **Public-private-partnerships (PPPs)** - PPPs involve collaboration between a government agency and a private-sector company.
- PPP road projects broadly fall in one of the two categories of 'toll' or 'annuity' that varies mainly in the way developers recover their investment.
- In the toll projects, NHAI passes on the toll collection rights and operation and maintenance obligations for 30 years to the private developer.
- This is done against payment of upfront, one-time, lump sum to the government.
- In the annuity model, a developer builds the highway, operates it for a specified duration and transfers it back to the government.
- The developer receives predefined annuity payments from the government after the launch of commercial operation of the project.
- Besides, many recent projects are being implemented under a hybrid annuity model (HAM).
- In HAM, payment is made in a fixed amount for a considerable period and then in a variable amount in the remaining period.
- With bidders showing less interest in the traditional toll or annuity PPP models, the government introduced the hybrid-annuity-model
- **Engineering-procurement-construction (EPC)** - The EPC contractors will carry out the detailed engineering design of the project, procure all the materials necessary and then construct.
- They finally deliver a functioning facility or asset to their clients.

#### How effective have PPPs been?

- In recent times, PPPs have emerged as the preferred approach of the Central government to develop roads in India.
- A comparison shows that roads built using the PPP model are on average longer compared to EPC roads.
- However, the unit cost (per lane-kilometer) did not show much variation across the two approaches.

- This indicates an apparent absence of economies of scale benefit in the longer PPP stretches.
- In terms of speed of construction, PPPs have scored.
- Private developers have cut down construction time by 63% compared to what the government takes.
- In terms of construction performance, while PPPs exhibit lower time overruns, EPC projects have lower cost overruns.
- Overall, the use of PPP helps in faster capacity creation.
- A major drawback of the PPP approach is its restricted applicability.
- Road projects that suffer from low traffic or revenue estimates are unlikely to generate the interest of private developers.

### How effective are State highways?

- In recent years, the National Highways Authority of India (NHAI) has played a major role in developing the country's road network.
- These, in particular, include the North-South and East-West corridor and the Golden Quadrilateral.
- However, a detailed comparison shows that State highways (SH) have superior construction characteristics than national highways.
- This is in contrast to the common perception that NHAI is more capable and more professionally managed than States' highway departments.
- Amongst PPP roads, State highway projects cost 42% less and are completed 33% faster than NH projects.
- In the case of EPC roads, SH projects take as long as NH projects, but at 33% lower cost.

### What are the possible reasons?

- The development of roads needs several issues to be addressed at a local level, which include -
  - i. land acquisition
  - ii. replacement of project-affected people
  - iii. availability of supporting facilities during project development
  - iv. public hearings and discussion with the local community, etc
- The State governments are better placed to resolve these issues than Central government agencies.
- Many of the clearances that need to be obtained for highway projects fall within the purview of the State government.
- So, co-ordination across different departments of the State government is easier than co-ordination between Central and State governments.
- Also, with limited budgets, the State highway departments are inclined to use them more efficiently.

### What is the road ahead?

- The strengths of the State highway departments, which seem to have been overlooked in recent years, should be recognised.
- Whether PPP or EPC, it appears that more projects could be brought under the domain of State highway departments.

### Quick Fact

#### National Highways Authority of India (NHAI)

- The NHAI was set up by the NHAI Act, 1988.
- It is an autonomous agency of the government.
- NHAI is mandated to implement the National Highways Development Project (NHDP).
- It is responsible for the development, maintenance and management of national highways, totaling almost 100,000 km in length.



## 10.2 Sutlej-Yamuna Link Canal

### Why in news?

- SC has recently ordered Punjab, Haryana and Centre to sort out Sutlej-Yamuna Link Canal issue amicably.
- It has brought to centre stage the contentious issue of sharing of waters between the two states.

### What is the issue?

- The issue dates back to 1966 at the time of reorganisation of Punjab.
- When Haryana was formed, a need arose to share river waters with the newly formed state.
- But Punjab was opposed to sharing waters of Ravi and Beas rivers with Haryana citing riparian principle.

### When did SYL come into being?

- In 1955, the water flowing down in Ravi and Beas was assessed at 15.85 million-acre feet (MAF).
- It was divided among Rajasthan (8 MAF), undivided Punjab (7.2 MAF) and J&K (0.65 MAF).
- After state reorganisation, the Centre issued a notification allocating 3.5 MAF to Haryana out of undivided Punjab's share 7.2 MAF.
- In a reassessment of water in 1981, Punjab was allocated 4.22 MAF and 3.5 MAF to Haryana.
- In 1982, then PM launched the construction of Satluj-Yamuna Link canal.
- A stretch of 214 km SYL was to be constructed out of which 122 km was to cross Punjab and the rest 92 km in Haryana.
- Haryana has been staking claim on Ravi-Beas waters through SYL canal on the plea that providing water for irrigation was a tough task for the state.
- But Akalis launched an agitation against the construction of the canal.
- In 1985, then PM and Akali Dal Chief signed an accord agreeing for a new tribunal to assess the water.
- The Eradi Tribunal was setup to reassess availability and sharing of water.
- The Tribunal, in 1987, recommended an increase in the shares of Punjab and Haryana to 5 MAF and 3.83 MAF, respectively.

### What are the other issues associated?

- There were militant activities in Punjab following the signing the accord.
- In 1985, Akali Dal Chief who signed the accord was killed.
- In the backdrop of this, the construction came to a halt and Punjab has been cautioning the Centre not to drag up this issue again.
- **Water** - As per government's study, Punjab state's many areas may go dry after 2029.
- The state has already over-exploited its groundwater for irrigation purposes as it fills granaries of centre by growing wheat and paddy worth Rs 70,000 crore every year.
- As per the reports, water in about 79 per cent area of the state is over-exploited.
- In such a situation when farmers are committing suicides, the Punjab government says, sharing it with any other state is impossible.
- In Haryana's southern parts, where the underground water had depleted up to 1700 feet, there was a problem of drinking water.
- Haryana has been demanding the justice by providing its rightful share in the water as assessed by a tribunal.



## 11. SCIENCE & TECHNOLOGY

### 11.1 Failure with Vikram Lander

#### What is the issue?

- ISRO failed in its attempt to soft-land the Vikram lander on the moon as part of the [Chandrayaan-2](#) mission.
- However, given its achievements, ISRO need not hide the setbacks in its maneuvers.

#### What makes Chandrayaan-2 mission so special?

- ISRO provides four reasons for what made the Chandrayaan-2 mission “special”.
- Chnadryaan-2 would be -
  1. the first space mission to conduct a soft landing on the moon’s south pole
  2. the first Indian expedition to attempt a landing on lunar surface using home-grown technology
  3. the first Indian mission to explore lunar terrain with home-grown technology
  4. the mission that would make India only the 4th country to soft land on the moon

#### What happened with the recent failure?

- ISRO could not soft-land the Vikram lander on the moon as planned.
- ISRO Chairman K. Sivan made it apparent that the Vikram lander had ceased to touch down on predicted lines.
- Less than 24 hours of the announcement, Vikram went from being the heart of the Chandrayaan-2 mission to being only 5% of the mission’s objectives.
- It was said that 90%-95% of the technology demonstration had already been done.
- ISRO also announced that the mission life of the orbiter had now dramatically increased to 7 years from the projected 1 or 2 years.

#### What is the contention here?

- The Indian Space Research Organisation (ISRO) has witnessed many trials and tribulations.
- Despite these, there has not been any major budgetary cuts or public censure over the descending trajectories of ISRO’s satellites.
- This raises the troubling question of why ISRO feels the need to retrospectively change the narrative of the Chandrayaan-2 mission and hide the setback.
- Moreover, with Russia withdrawing from the earlier plan to provide the lander, India decided to design a lander and rover on its own.
- It is now hard to understand how such an iconic module that shows India’s ability to design a space vehicle suddenly became only 5% of the overall mission objective.

#### Where does Chandrayaan-2 stand now?

- With the special aspect missing, the Chandrayaan-2 is now in the league of its predecessor Chandrayaan-1, launched in 2008.
- Chandrayaan-1 included a lunar orbiter and a moon impact probe that crash-landed on the lunar equatorial surface.
- The key difference is that Chandrayaan-2, propelled by the GSLV Mk-III rocket, went all the way into a lunar orbit.
- This proved that ISRO had mastered the nuances of the cryogenic engine, which allows rockets capable of carrying heavier payloads to be designed.
- This is going to be what truly propels India into the league of space powers.
- And with the Chandrayaan-2 mission, ISRO only needs to explain its setbacks, not hide them for the cause of national pride.



## 11.2 Quantum Supremacy - Google Researchers

### Why in news?

It was reported that a draft research paper claimed that Google researchers had achieved a long-sought-after goal in physics called “quantum supremacy”.

### What is the paper on?

- The draft paper had appeared on the NASA website and was then pulled down, but the Financial Times of the UK had retrieved a copy.
- It is said to have been written by scientists at Google and the Quantum Artificial Intelligence Lab collaboration that includes NASA researchers.
- The draft paper is believed to be an early version of a paper that has been submitted to a scientific journal.

### What is a quantum computer?

- A quantum computer differs from a traditional computer in the way it stores information.
- A traditional computer stores information in the form of bits that can take only two values - zero or one.
- A quantum computer stores it in the form of quantum bits (qubits) that can take on various combinations of zero and one.

### What is Quantum supremacy?

- Quantum supremacy refers to a quantum computer solving a problem that cannot be expected of a classical computer in a normal lifetime.
- This relates to the speed at which a quantum computer performs.
- The quantum processor referred in the paper took 200 seconds to perform a calculation.
- The world’s fastest supercomputer, Summit, would have taken 10,000 years to accomplish this.

## 12. ENVIRONMENT

### 12.1 Restoration of Degraded Land - UNCCD

#### Why in news?

- The 14th Conference of Parties (COP14) of the UN Convention to Combat Desertification (UNCCD) was held in Greater Noida, Uttar Pradesh.
- India has committed to restore 26 million hectares of degraded land by 2030.

#### What is the rationale?

- Climate-change-induced extreme weather events have become alarmingly common.
- India’s commitment reflects a growing realisation of this fact.
- India will restore 26 million hectares of degraded land by 2030, more than its earlier target of 21 million hectares.
- In the afforestation process, India is set to create a carbon sink of close to 3 billion metric tonnes through additional tree cover.

#### How significant is afforestation?

- The financial and human costs of climate-related calamities can no longer be confined to the margins of policymaking.
- The policy push to solar power and the efforts to shift to EVs must count as notable steps to reduce carbon emissions.
- However, afforestation is what matters the most.

- This is because, soil degradation accounts for more emissions than any other activity.
- It is due to the fact that the soil stores three times the amount of carbon as the atmosphere.
- Carbon sequestration, or the creation of carbon sinks, therefore must assume centre-stage.
- An intensive afforestation programme requires adoption of the right forestry practices, and above all, a good amount of money.

### Why have carbon credit market failed?

- ‘Carbon credit markets’ have failed to generate funds for the developing world.
- The world moved from a regime of mandatory commitments on the part of the industrialised countries under the 1997 Kyoto Protocol to voluntary ones under the 2015 Paris accord.
- Around the same time, it also impacted the shift towards clean development engineered by ‘carbon credits’ or Carbon Emission Reduction certificates.
- These certificates were bought by EU countries for funding clean projects in the developing world.
- They also worked as a sort of fine for not meeting emission targets.
- But since these certificates were often underpriced and the wrong projects identified, neither party met their obligations.
- After the Paris pact, emission reduction targets became vague, and so, this seriously disturbed the working of carbon credits market.
- Evidently, as the UNEP report on ‘emissions gap’ observes, global emissions peaked in 2017 after 3 years of stagnation.
- The REDD+ initiative has also failed due to faulty carbon pricing and the poor negotiating rights of traditional communities.
- [REDD+ - Reducing Emissions from Deforestation and Degradation plus conservation, sustainable management of forests, and enhancement of forest carbon stocks]

### What should be done?

- A multilateral body just for funding green initiatives must be set up.
- The best recourse for India is to leverage a corpus set up under the initiative of the Supreme Court in 2002 - the Compensatory Afforestation Management and Planning Authority (CAMPA).
- Under this, projects in forest areas have to compensate for the forest cover destroyed by depositing a value in the CAMPA corpus.
- This, in turn, will be used for forestry programmes.

## 12.2 ‘Green Bonus’ Demand of Himalayan States

### What is the issue?

- Recently, 11 Himalayan States of India met in Dehradun, Uttarakhand, demanding a “green bonus”, or a payment for environmental services they provide to the nation.
- This has brought to the surface the long-standing problem of integration of the mountain regions with the mainstream India.

### What was the demand?

- The Himalayan states stretch from J&K (which was still a State during the meet) to Tripura.
- The ruling government had earlier committed a financial package to address the special developmental needs of the Himalayan States.
- The Himalayan States argued that they paid a developmental price for maintaining forests, rivers, and other environmental goods that help the rest of the country.
- The States, thus, asked for –
  - i. help to develop hydropower resources

- ii. subsidies for their environmental protection measures which deny them normal 'development models'
- iii. recognition of their efforts to meet human development parameters

### **What is the larger issue in mountainous regions?**

- Both the abrogation of special status to J&K, the following clampdown on civilian life, and the current demand of the Himalayan States highlight a key issue.
- It is the inability of the country to come to terms with the specificity of the Himalayan region, whether political, social, or ecological-economic.
- Various researches have shown how structurally different are Himalayan regions from the Indian mainstream in terms of their social and economic structure.
- Yet, this research has not found place in the political understanding, whether at the level of policy formulation or popular conceptions.

### **Is this specific to India?**

- The problem of integrating the northern mountains to the national mainstream is not specific to India.
- It covers the entire stretch of mountains from Balochistan to Arunachal Pradesh.
- Each of the regions situated here has had problems when it comes to integrating the hilly regions with the nation states that are primarily anchored in the plains.
- Furthermore, this 'integration problem' is not just a South Asian phenomenon.
- China is struggling to integrate its mountain people and their homelands with its national mainstream.
- Myanmar and Thailand, besides others, are also facing similar issues.

### **Is this a legacy of the colonial era?**

- The colonial force was anchored in the society and political-economy of the plains.
- The colonial times were perhaps the first time the nation state of the plains was able to reach so deep into the Himalayas.
- They controlled the people of the mountains in a way which was historically unprecedented.
- By the end of the 19th century, the mountains were far from the desires of keeping the mountains politically quiet and socially peaceful.
- The postcolonial nation states of Asia (be it India, Pakistan, China or Myanmar) have not been able to change this difficult relation with their mountain regions.
- This is because the independent nation states largely adopted the same approach in the high Himalayas as that of their colonial predecessors.

### **What are the consequences of this?**

- The policies were framed on the social, political and economic specificities of the communities based in the riverine plains, different from that of the mountains.
- It is the village or town of the Ganga plains, or along the Narmada or Krishna and Cauvery rivers that defined what it means to be 'Indian'.
- The specificities of the mountain regions found no references in--
  - i. the norms of what an 'Indian village' is
  - ii. how the society is structured
  - iii. how the economy is designed
  - iv. what ways does political life work
- In the mainstream thoughts, the mountain regions are at best imagined as calm 'hill stations' peopled by 'noble savages'.
- Otherwise, they are seen as wild regions inhabited by irrational bloodthirsty tribesmen.
- This is not only a social-psychological feature but has direct practical consequences.



- Policies and programmes are devised with the 'national norm' in mind, which have unintended consequences on the hilly regions.

#### **What is the present scenario in India in this regard?**

- In India, there has been a massive expansion of the national economy over the past three decades.
- This, now, allows for commodification of mountain resources (forests, water, labour, tourism, horticulture, even agriculture) in unprecedented ways.
- It has led to changes in the class structure and the emergence of a new middle class.
- The national aspirations now find the geographical specificity of the Himalayas a hindrance and the main commodity of exchanges.
- Thus, the secessionist movements in J&K and Nagaland on the one hand and active integrationist movements in H.P., Arunachal Pradesh and Manipur on the other, expresses the same problem.

### **12.3 Atlantic Meridional Overturning Current**

#### **What is the issue?**

- Atlantic Meridional Overturning Current (AMOC) is thought to be slowing down for the last 15 years, which could have drastic consequences on global climate.
- A new study suggests that AMOC is getting help from the Indian Ocean.

#### **What is an AMOC?**

- Atlantic Meridional Overturning Current is the large system of ocean currents operating in the Atlantic Ocean.
- It circulates the waters between the north and the south.
- It ensures the oceans are continually mixed, and heat and energy are distributed around Earth.
- Warming as a result of climate change, the Indian Ocean is causing a series of cascading effects that is providing AMOC a "jump start".

#### **How AMOC works?**

- As warm water flows northwards in the Atlantic, it cools, while the evaporation increases its salt content.
- Low temperature and high salt content raise the density of the water, causing it to sink deep into the ocean.
- The cold, dense water deep below slowly spreads southward.
- Eventually, it gets pulled back to the surface and warms again and, the circulation is complete.
- This continual mixing of the oceans, and distribution of heat and energy around the planet, contribute to global climate.
- Another oceanic system, which is more frequent, is the El Niño-Southern Oscillation (ENSO).
- This involves temperature changes of 1°-3°C in the central and eastern tropical Pacific Ocean, over periods between 3 and 7 years.
- **El Niño** refers to warming of the ocean surface and **La Niña** to cooling, while "Neutral" is between these extremes.
- This alternating pattern affects rainfall distribution in the tropics and can have a strong influence on weather in other parts of the world.

#### **What is happening now?**

- AMOC has been stable for thousands of years.
- Data since 2004 and projections are cause for concern.
- It is not clear whether the signs of slowing in AMOC are a result of global warming or only a short-term anomaly.
- Yale University research - AMOC had weakened substantially 17,000 to 15,000 years ago.

- The new study, by Fedorov and Shineng Hu of Scripps Institution of Oceanography, appears in Nature Climate Change.

### What is Indian Ocean's role?

- Fedorov and Hu's work involves climate mechanisms that may be shifting due to global warming.
- Using observed data and computer modelling, they have plotted out what effect such shifts might have over time.
- In this study, they looked at warming in the Indian Ocean.
- **Their findings** - As the Indian Ocean warms faster and faster, it generates additional precipitation.
- This draws more air from other parts of the world to the Indian Ocean, including the Atlantic.
- With so much precipitation in the Indian Ocean, there will be less precipitation in the Atlantic Ocean.
- Less precipitation will lead to higher salinity in the waters of the tropical portion of the Atlantic.
- This saltier water in the Atlantic, as it comes north via AMOC, will get cold much quicker than usual and sink faster.
- This would act as a jump start for AMOC, intensifying the circulation.
- **Concern** - It is not know how long this enhanced Indian Ocean warming will continue.
- If other tropical oceans' warming, especially the Pacific, catches up with the Indian Ocean, the advantage for AMOC will stop.

## 13. INTERNAL SECURITY

### 13.1 Concerns with UAPA Tribunals

#### What is the issue?

- Amendments to the Unlawful Activities (Prevention) Act, 1967 (UAPA) were passed recently. Click [here](#) to know more.
- A close reading of UAPA Tribunal orders shows how fundamental principles of fair procedure are being ignored.

#### How does UAPA works?

- Before the 2019 amendments, the UAPA could be used to ban associations and not individuals.
- To this end, the UAPA required, and still requires that the ban must clearly spell out the grounds on which the government has arrived at its opinion.
- It may then be contested by the banned association before a Tribunal, consisting of a sitting High Court judge.
- As a number of judgments have held, the task of a UAPA Tribunal is to carefully scrutinise the government's decision.
- In doing so, it should keep in mind that banning an organisation or a group infringes the crucial fundamental freedoms of speech and association.

#### What are the shortfalls?

- A close reading of UAPA Tribunal orders makes it clear that the requirement of judicial scrutiny is not implemented in true spirit.
- The tribunal makes it easy for the government to prove its case.
- In effect, the tribunal departs from some of the most fundamental principles of fair procedure.
- They act as little more than judicial rubber stamps.
- This is made evident by a recent UAPA Tribunal Order (on August 23, 2019) confirming the government's ban on the Jamaat-e-Islami, Jammu and Kashmir ("JeI, J&K").



### What was the charge on JeI, J&K?

- The government's ban on the JeI, J&K was based on its opinion that the association was -
  - i. supporting extremism and militancy
  - ii. indulging in anti national and subversive activities
  - iii. indulging in activities to disrupt the territorial integrity of the nation
- In support of this opinion, the government said that there were a large number of First Information Reports (FIRs) against various members of the association.
- Among other things, the JeI, J&K responded that for almost all of the FIRs in question, the people accused had nothing to do with the association.
- It was also argued that this could be proven by looking at the association's membership register.
- But, the membership register had been seized by the government.

### Why is the ban on JeI contentious?

- If the government proves the case with sufficient evidence of wrongdoing against JeI's members, it could be resolved straightforwardly.
- However, government resorts to the "sealed cover jurisprudence", submitting material that it claimed was too sensitive to be disclosed.
- The material on the basis of which the ban is justified is crucial for the association to defend itself.
- But, notably, the evidence was not disclosed even to the association and its lawyers, who were contesting the ban.
- More worryingly, the UAPA Tribunal took a decision on the legality of a ban by looking at secret material that is withheld even from the association.
- It was said that the evidence in the sealed covers was carefully examined and the tribunal was convinced of them to be "credible documents."
- The association's request to the government to produce the membership register also failed as the government submitted even this piece of evidence in a sealed cover.

### What is the larger concern?

- In essence, the fundamental freedoms of speech and association have been violated on the basis of secret evidence.
- The most basic rules of procedural justice and fairness seem to have been compromised.
- Courts seem to be acting to legitimise and enable governmental overreach, rather than protecting citizens and the rights of citizens against the government.

## 13.2 India's Nuclear Weapon Policy

### Why in news?

Defence Minister has recently dropped a hint that in the future, India's No First Use (NFU) promise "depends on circumstances".

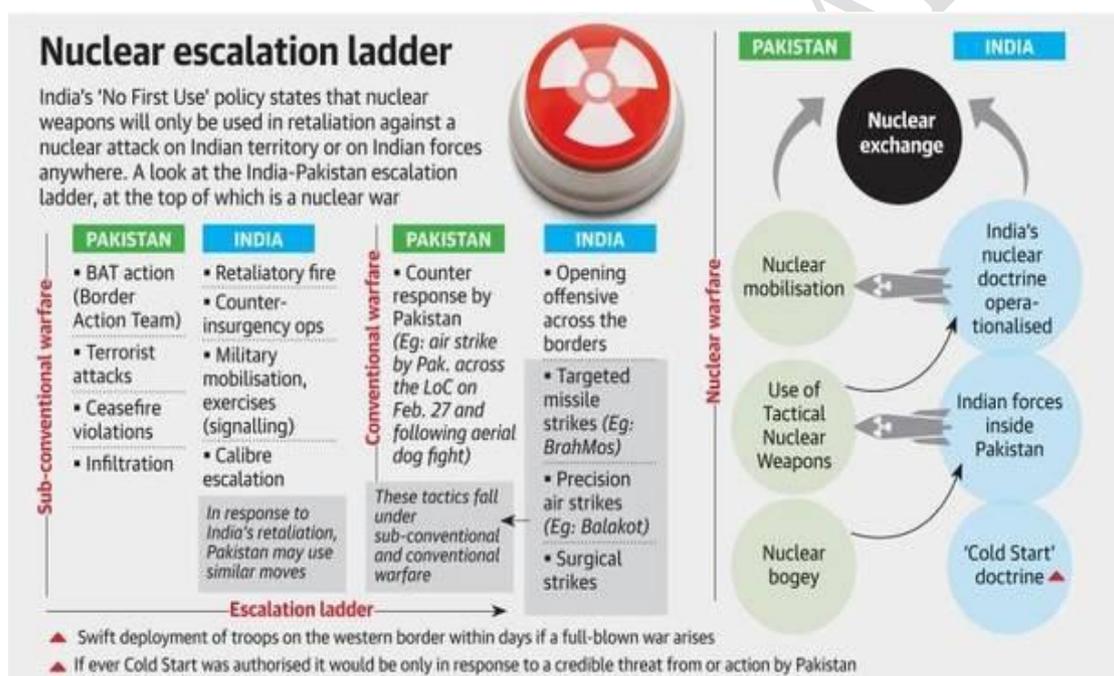
### How does India's N-weapon journey begin?

- After a face-off with China in 1962 and its nuclear test in 1964, India embarked on the path of nuclear weapons development.
- In 1974, India conducted its first nuclear tests, Pokhran-I, a "peaceful nuclear explosion".
- Despite decades of international pressure, India carried out Pokhran – II in May 1998.
- Its successful execution showed that India had the ability to launch nuclear warheads in its missile programme.
- After Pokhran – II, Pakistan also carried out similar tests.

- In 1999, India came out with an explicit nuclear doctrine that committed “Minimal Deterrence, No First Use and Non-Use against non-nuclear weapon states”.
- “No First Use” Policy emphasis that it would never carry out a nuclear first strike and it went together with credible minimum deterrence (CMD).

### What does CMD and Cold Start Doctrine mean?

- CMD does not imply indefinite expansion of the nuclear arsenal, rather it is built on an assured second-strike capability.
- In the event of another nation carrying out a first nuclear strike of any magnitude, India’s nuclear force will be deployed to ensure survivability of the attack, punitive nuclear retaliation and inflicting damage that aggressor will find it “Unacceptable” level.
- After the Operation Parakram in 2002, Cold Start Doctrine began to find a place in the military setup.
- It envisages swift deployment of troops on the western border within days if a situation of a full-blown war arises.
- It allows Indian forces to conduct sustained attacks while preventing a nuclear retaliation from Pakistan.
- However, in 2010, India denied employing any such doctrine when US had taken up concerns by Pakistan on the perceived Cold Start strategy of the Indian Army.



### What is the changing paradigm in the policy?

- In the aftermaths of the attack on the Indian Parliament in 2001 and the Mumbai terror attacks in 2008, neither country felt inclined to instigate all-out war.
- Pakistan, as a counter to its speculation that India might have developed the “Cold Start” doctrine, it started speaking out about their development of Tactical Nuclear Weapons.
- Tactical nuclear weapons, or “theatre nukes”, which had a lower yield but could still inflict enough damage to blunt a conventional attack.
- There are concerns that India will retaliate massively even if Pakistan uses tactical nuclear weapons.
- It would take both countries back into the old-world deterrence paradigm of “mutually assured destruction”.
- This is because any surviving forces in Pakistan after India’s retaliation would surely launch a devastating attack against targets across India.
- India may have more to gain by pre-emptive action.

- India's hard counterforce attack on Pakistan strategic nuclear assets on land and Sea against a relatively small number tactical nuclear attack will eliminate its ability to destroy Indian strategic targets and cities.
- Such a strategy would be consistent with India's doctrine of massive retaliation.
- Thus, the adoption of this kind of counterforce option may require no explicit shifts in the declared nuclear doctrine.
- But, remaining silent of this subject would create deliberate nuclear ambiguity, a strategic advantage for India.
- It might compel Pakistan to adjust its nuclear posture, which in turn risks fuelling an arms race or more unstable nuclear weapons deployment patterns in Pakistan.

## PRELIM BITS

### 14. HISTORY AND ART & CULTURE

#### *Dadabhai Naoroji Birth Anniversary*

- September 4, 2019 was the 194<sup>th</sup> birth anniversary of 'Dadabhai Naoroji'.
- "Grand Old Man of India", was among the first leaders who stirred national consciousness in the country.
- He was closely involved with the Indian National Congress in its early phase.
- His first agitation, in 1859, concerned recruitment to the 'Indian Civil Service' (today's IAS).
- In 1865 and 1866, Naoroji helped in founding the 'London Indian Society' and the 'East India Association' respectively.
- In 1885, Naoroji became a vice-president of the Bombay Presidency Association.
- He was nominated to the Bombay legislative council and helped form the Indian National Congress (INC).
- He was Congress president thrice, in 1886, 1893, and 1906.
- He was the first Asian to become a 'British MP' when he was elected to the House of Commons in 1892.
- In the British Parliament, he worked to bring Indian issues to the fore and a moderate himself, he acted as a liaison between nationalist Indians and British parliamentarians.
- In 1893, he helped form an Indian parliamentary committee to attend to Indian interests.
- Naoroji was a vocal critic of the colonial economic policy in India.
- He was the key proponent of "**Drain Theory**", disseminating it in his book "Poverty and Un-British Rule in India".
- He argued that imperial Britain was draining away India's wealth to itself through exploitative economic policies.
- He set up the 'Gyan Prasarak Mandal' (Society for Promotion of Knowledge) for the education of Indians.
- He acted as a mentor to Mahatma Gandhi, Bal Gangadhar Tilak and Gopal Krishna Gokhale.

#### *Indo-European language origins*

- Largest-ever study of ancient human DNA illuminates the Indo-European language origins.
- It indicated that Indo-European languages, arrived in Europe via the steppes.
  1. Indo-European languages are the world's biggest language group.
  2. It includes Hindi-Urdu, Farsi, Russian, English, French, Gaelic and more than 400 other languages.
- It suggests that the mass migration of Bronze Age herders from Eurasian Steppes, starting 5,000 years ago, westward to Europe and east to Asia.



- Despite being spread over a vast area encompassing myriad cultures, these languages share uncanny similarities in syntax, numbers, basic adjectives and numerous nouns.
- The study also found that the present-day speakers of both these groups descend from a subgroup of steppe herders.
- They moved west toward Europe 5,000 years ago, then spread back east to Central and South Asia in the following 1,500 years.
- It also found that,
  1. South Asians who today speak Dravidian languages (mainly in southern India and southwestern Pakistan) had very little steppe DNA.
  2. While those who speak Indo-European languages like Hindi, Punjabi, Bengali have far more.
- As far as agriculture is concerned, prior work has found that farming spread to Europe via people of Anatolian ancestry.
- The study also points out that these steppe land herders have left their genetic mark on most Europeans living today.

### ***Harappan Civilization DNA Study***

- A new DNA study finds 2500 BC 'Rakhigarhi' skeletons have no traces of 'Aryan gene'.
- Study examined DNA of skeletons found in Rakhigarhi, an Indus Valley Civilisation site in Haryana.
- It found that there are no traces of R1a1 or Central Asian 'steppe', gene.
- The population has no detectable ancestry from Steppe pastoralists or from Anatolian (modern day Turkey) and Iranian farmers.
- It suggests that farming in South Asia arose from local foragers rather than from large-scale migration from the West,
- The Central Asian 'steppe' gene is found in much of the Indian population today.
- These DNA in Rakhigarhi had little of any Steppe pastoralist-derived ancestry.
- It shows that it was not ubiquitous in north-west South Asia during the IVC as it is today
- The paper indicates that there was no Aryan invasion and no Aryan migration and all the developments from the hunting-gathering to modern times in South Asia were done by indigenous people.
- The paper concludes Indians came from a genetic pool predominantly belonging to an indigenous ancient civilisation.

### ***Asiatic Society of Mumbai***

- Recently, the Asiatic Society of Mumbai, elected its **first** woman president ('Prof. Vispi Balaporia') in 215 years of its existence.
- The Asiatic Society began its journey in 1804 as the Literary Society of Bombay.
- It was founded by 'Sir James Mackintosh', a Scottish colonial administrator who had a keen interest in Oriental studies.
- In 1826, the Literary Society became the Mumbai arm of the London-based Royal Asiatic Society of Great Britain and Ireland.
  - It came to be called the Bombay Branch of the Royal Asiatic Society (**BBRAS**).
- In its early days, membership of the Society was restricted to Europeans and the natives were not allowed to join until 1841.
- In 1954, the institution was severed from its London parent and became the Asiatic Society of Bombay.
- In 2002, it acquired its present name and its journal has been in publication since 1841.
- Its activities include conducting historical research, awarding historians, and running an institute of post-graduate studies.



- It's library, home to over 1 lakh books, consists of rare manuscripts contributed to it by the East India Company.
- It also the prized collections of Original copy of Dante's Divine Comedy and Coins issued by 'Kumaragupta' (5<sup>th</sup> century), 'Akbar' (16<sup>th</sup> century) and 'Shivaji' (17<sup>th</sup> century).
- The Society offers Junior Fellowships for research.
- It recommends scholars for the 'Tagore National Fellowship' of the Ministry of Culture.
- The Governor of Maharashtra is the Society's Chief Patron.

### ***Marsiya Poetry in India***

- The word 'Marsiya' means '**Elegy**', meaning a poem which is a lament for the dead.
- Recently, Former Vice President, praised Marsiya tradition of Urdu poetry, calling the art form an important part of '**Adab**' (literature)
- Marsiya poetry, holds special significance for **Shia Muslims**.
- It is a form of literary expression that is dedicated to describing the persona of 'Imam Hussain',
  1. He is the grandson of the Prophet and a revered figure in the Islamic world.
  2. He and his kin underwent hardships during the historic Battle of Karbala.
  3. It praise his family members who died at the Battle of Karbala in the year 680 CE in present-day Iraq.
- Marsiya is typically read in the month of Muharram.
- The Marsiya tradition first evolved in Delhi and the Deccan.
- It reached its zenith under the patronage of the Nawabs of Lucknow,
  1. He encouraged the art form in 18<sup>th</sup> and 19<sup>th</sup> centuries around the same time when Mughal power was steadily receding.
- Its most iconic poets are '**Mir Anis**' and '**Mirza Dabir**', who made a profound impact on Marsiya.
- Marsiya is usually sung, and set to Indian Ragas, creating a fusion of music and poetry.

## **15. POLITY**

### ***HC guidelines on Article 25***

- HC of Karnataka has declared that Article 25 (Freedom to free profession, practice and propagation of religion), does not extend to public road and footpath.
- It said that denial of permission to put up temporary structures on roads and footpaths for religious festivals or functions will not infringe upon the freedom granted Article 25.
- It also observed that one cannot get rights to use public roads and streets just because it was for religious purpose.
- It issued guidelines to all city municipal corporations on processing applications for temporarily using public roads and footpaths.

## **16. GEOGRAPHY**

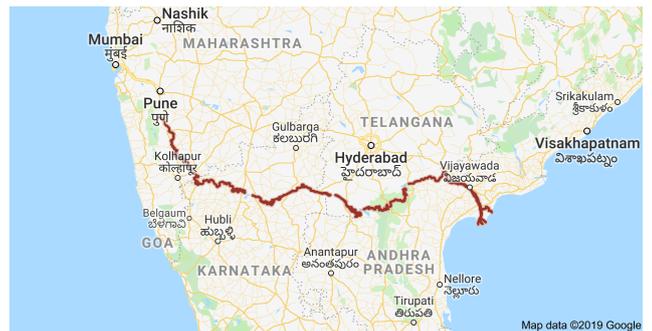
### ***IMD Colour-Codes***

- The 'India Meteorological Department' (IMD) issued a '**Red**' alert for Mumbai due to continuous downpour across the city.
- IMD uses **4** colour codes to indicate various categories of alerts, from Green to Red.

- **Green (All is well)**
  1. No action needs to be taken by the authorities.
  2. The forecast is of light to moderate rain.
- **Yellow (Be Aware)**
  1. Authorities are advised to “Be updated” on the situation.
  2. It also suggests that the weather could change for the worse.
- **Orange/Amber (Be prepared)**
  1. Authorities are expected to “Be prepared”.
  2. The forecast is of heavy to very heavy rainfall.
  3. It is also a sign for people to prepare for evacuation.
- **Red (Take Action)**
  1. Authorities to “Take action”.
  2. The forecast is for extremely heavy rainfall.
  3. Extremely bad weather conditions, certainly going to disrupt travel and power and has significant risk to life.
- These alerts are universal in nature and are also issued during floods.
- **Rainfall levels** (according to **IMD**),
  1. Moderate - 15.6 mm to 64.4 mm rain in 24 hours
  2. Heavy - 64.5 mm to 115.5 mm in 24 hours
  3. Very heavy - 115.6 mm to 204.4 mm in 24 hours
  4. Extremely heavy - more than 204.5 mm in 24 hours.

### ***Krishna Water dispute***

- Recently, Maharashtra and Karnataka Chief Ministers jointly oppose Andhra Pradesh’s application.
- A.P seeks to relook at the Krishna Water Disputes Tribunal’s 2010 order on water distribution between the riparian states.
- This took a new turn in the Krishnawater dispute.
- The Krishna is an east-flowing river that originates at Mahabaleshwar in Maharashtra.
- It is flowing through Maharashtra, Karnataka, Telangana and Andhra Pradesh before entering into the Bay of Bengal.
- A dispute over the sharing of Krishna waters has been ongoing for many decades.
- In 1969, the ‘Krishna Water Disputes Tribunal’ (**KWDT**) was set up under the Inter-State River Water Dispute Act, 1956.
- It presented its report in 1973, which was published in 1976.
  1. It divided the 2060 TMC of Krishna water at 75% dependability into 3 parts.
  2. 560 TMC for Maharashtra, 700 TMC for Karnataka and 800 TMC for Andhra Pradesh.
  3. It also stipulated that KWDT order may be reviewed or revised by a competent authority or tribunal any time after May 31, 2000.
- The second KWDT was instituted in 2004. It delivered its report in 2010.





1. It made allocations of the Krishna water at 65% dependability and for surplus flows.
  2. 81 TMC for Maharashtra, 177 TMC for Karnataka, and 190 TMC for Andhra Pradesh.
- Soon after the 2010 report, Andhra Pradesh challenged it through a Special Leave Petition before the Supreme Court.
  - In an order, the apex court stopped the Centre from publishing it in the official Gazette.
  - In 2013, the KWDT issued a 'further report', which was again challenged by Andhra Pradesh in the Supreme Court.
  - After the creation of Telangana in 2014, the Water Resources Ministry has been extending the duration of the **KWDT**.
  - Andhra Pradesh has since asked that Telangana be included as a separate party at the KWDT.
  - The allocation of Krishna waters be reworked among four states, instead of three.
  - Maharashtra and Karnataka are now resisting this move.
  - According to these 2 states, Telangana was created following bifurcation of Andhra Pradesh.
    - Therefore, allocation of water should be from Andhra Pradesh's share which was approved by the tribunal.

### ***Goldschmidtite***

- It is a new mineral from the Earth's mantle, found inside a diamond in Koffiefontein, South Africa.
- It has been named after Victor Moritz Goldschmidt, the Norwegian scientist acknowledged as the founder of modern geochemistry.
- It has high concentrations of niobium, potassium and the rare earth elements lanthanum and cerium.
- It is an unusual chemical signature for a mineral from Earth's mantle, which is usually dominated by elements such as magnesium and iron.
- Though the mantle makes up about 80% of the Earth's volume but very little is known about it.
- Diamonds hold clues as they are found up to 160 km beneath the surface, in the upper mantle.
- Diamonds that are unearthed were brought up closer to the surface, probably as a result of violent volcanic eruptions when the Earth was hotter.

## **17. SOCIAL ISSUES**

### ***Legal age for Marriage***

- A couple in Punjab, a 19-year-old male and a 24-year-old female, have been provided security cover on the court's orders.
- They claim they are married and have a certificate from a Gurdwara.
- The case rose to prominence after 3 members of the man's family were murdered allegedly by the girl's family.
- 'Hindu Marriage Act, 1955' (which also applies to Sikhs) states that a girl must be 18 and a boy 21 at the time of marriage.
- But as per the 'Majority Act, 1875', every person domiciled in India attain the age of majority on completing the age of 18.
- Even the Supreme Court has clearly specified that 2 adults, 18 or above, can live together with their consent as 'live-in partners', even if they are not married.
- As per the 'Hindu Marriage Act', a marriage can either be declared void (completely illegal) or voidable by the court.
  1. It can be declared 'voidable' if an objection is filed saying that consent of boy or girl wasn't taken.
- In an order dated May 7, 2018, the Supreme Court in one such case where girl was 19 but boy was not 21, said,



1. It is sufficient to note that both of them are major.
  2. Even if they were not competent to enter into wedlock, they have right to live together even outside wedlock.
  3. The freedom of choice would be of the girl as to with whom she wants to live.
- The live-in relationship is now also recognised under the Protection of Women from Domestic Violence Act.
  - A debate has been ongoing on making 18 as uniform age for marriage for both men and women in India.
  - 'Anand Marriage Act' which was notified in Punjab, only applies for separate registration of Sikh marriages but not in case of disputes.

## 18. GOVERNMENT INITIATIVES

### *Project Bal Basera*

- 'Bal Basera' or a 'Creche' has been inaugurated for the welfare of Children of Construction Workers deployed at AIIMS Rishikesh.
- Project is being executed by 'Central Public Works Department' (CPWD), Ministry of Housing & Urban Affairs.
- CPWD has signed an MoU with CPWD OWA (Officers' Wives Association), which shall run Bal Basera.
- The Creche shall accommodate about 35 Children.
- CPWD OWA, a socio-cultural organization, is actively involved in the social welfare activities of weaker sections of society.
- It is providing monetary help to the families of CPWD employees in distress.
- It manages a large number of Bal Baseras and organizing health camps at construction sites, a day care centre.

### *Cyberdome*

- It is Kerala State police department's premier facility dedicated to preventing cybercrime and mitigate security threats to the State's critical information infrastructure.
- It is the state-of-the art lab with enabling software to crackdown the criminal activities over the Darknet.
- Darknet is a layer of the Internet accessible only by using special software like Tor (The Onion Router), or I2P, which stands for Invisible Internet Project.
- Websites and information on the Darknet are intentionally hidden and cannot be accessed using traditional search engines like Google.
- Its impermeability become a major platform for drug dealers, arms traffickers, child pornography collectors and other criminals involved in financial and physical crimes.
- In order to handle these type of crimes, cyber-surveillance tools to detect and convict those responsible for industrial espionage.
- Cyberdome has used social engineering as the lynchpin of its policing strategy to snoop on radical groups that use the net for extremist activities.

## 19. GOVERNMENT SCHEMES

### *National Educational Alliance for Technology*

- NEAT is a public-private partnership scheme aims to harness technology for better learning outcomes in higher education.



- This initiative under 'Ministry of Human Resource Development' is to provide wider access to adaptive learning technologies.
- The new scheme **NEAT** is in partnership with companies using Artificial Intelligence.
- To make learning more personalised and customised as per the learner's requirements.
- Start-ups which join the government platform must offer 25% free coupons for students from disadvantaged communities.
- **MHRD** would act as a facilitator to ensure that the solutions are freely available to a large number of economically backward students.
- It would create and maintain a National NEAT platform that would provide one-stop access to technological solutions.
- **NEAT** will be administered by an apex committee constituted by the Ministry.
- It will have an independent expert panels, being set up to evaluate and select the best EdTech solutions.

### ***Participatory Guarantee Scheme***

- **FSSAI** expects, the Agriculture Ministry's **PGS** to incentivise more farmers to grow organic food.
- Participatory Guarantee Scheme (**PGS**) is a process of certifying organic products.
- It ensures that their production takes place in accordance with the laid-down quality standards.
- The certification is in the form of a documented logo or a statement.
- The certified organic food production is still very low. The PGS brings together peer group of farmers and the costs are low.
- According to **PGS-India**,
  1. An 'Operational Manual for Domestic Organic Certification' published in 2015.
  2. It was published by the 'National Centre of Organic Farming', Ghaziabad, under the Ministry of Agriculture.
  3. **PGS** is a quality assurance initiative, operates outside the framework of third-party certification.
- According to a definition formulated by the International Federation of Organic Agriculture Movements (**IFOAM**),
  1. PGSs are "locally focused quality assurance systems".
  2. It certifies the producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange.
  3. **IFOAM** is a Bonn-based global umbrella organisation for the organic agriculture movement.
- **Four pillars of PGS in India are**,
  1. Participatory approach, a shared vision, transparency and trust.
- The advantages of **PGS** over third-party certification, identified by the government document are,
  1. Procedures are simple, documents are basic, and farmers understand the local language used.
  2. All members live close to each other and are known to each other.
  3. Because peer appraisers live in the same village, they have better access to surveillance.
  4. Peer appraisal instead of third-party inspections also reduces costs.
  5. Mutual recognition and support between regional PGS groups ensures better networking for processing and marketing.
  6. It offers every farmer individual certificates, and the farmer is free to market his own produce independent of the group.
- Individual farmers or group of farmers smaller than 5 members are not covered under **PGS**.
- They either have to opt for third party certification or join the existing **PGS** local group.

## BILATERAL ISSUES

### Eastern Economic Forum

- **EEF** was established by a decree of the President of the Russian Federation, in 2015.
- It takes place each year in Vladivostok.
- It serves as a platform for the discussion of key issues in World economy, regional integration and the development of new industrial and technological sectors.
- It aims to support economic development of Russia's '**Far East**' (easternmost part of Russia), and to expand international cooperation in Asia-Pacific region.
- The macro-region borders 2 oceans, the Pacific and the Arctic, and 5 countries - China, Japan, Mongolia, the United States and the N.Korea.
- The Far East is rich in natural resources like diamonds, stannary, gold, tungsten, fish and seafood.
- About 1/3<sup>rd</sup> of all coal reserves and hydro-engineering resources of the Russia are available here.
- Indian Prime Minister attended the 5<sup>th</sup> 'Eastern Economic Forum' (**EEF**) in Vladivostok, Russia.
- PM announced India would extend a \$1 billion line of credit towards the development of the Russian Far East.
- India was the first country in the world to open a consulate in Vladivostok.
- Among the participants in the Summit are India, Malaysia, Japan, Australia, and South Korea.
- Lack of manpower is one of the main problems faced by the Far East.
- Given this, Indian professionals like doctors, engineers and teachers can help in the region's development.
- The two countries agreed for the Chennai-Vladivostok sea route.

### Chennai to Vladivostok Sea route

- A Memorandum of Intent was signed to open a full-fledged maritime route between Russia's eastern port city and Chennai.
- This would allow India access to Russia's Far East in 24 days, compared to 40 days taken by current route via Suez Canal.
- This would also open new opportunities for India, like the India-Russia-Vietnam trilateral cooperation.
- In Russian, 'Vladivostok' is 'Ruler of the East', located on the Golden Horn Bay to north of North Korea and a short distance from Russia's border with China.
- It is the largest port on Russia's Pacific coast.
- Automobiles are a major item of import at the port, from where they are often transported further inland.
- India is building nuclear power plants with Russia's collaboration in Kudankulam, Tamil Nadu.
- The opening of a sea route is likely to help in the project.
- A vibrant sea route will help in the upscaling of trade relations between the two nations.
- It will also increase India's presence in the Indo-Pacific, and especially the South China Sea.



## 20. INTERNATIONAL ORGANISATIONS

### CARICOM Countries

- The Caribbean community, also known as CARICOM, was formed in 1973 by the Treaty of Chaguaramas.

- It is an economic and political community that works jointly to shape policies for the region and encourages economic growth and trade.
- It is a grouping of 15 member states and five associate members ( Anguilla, Bermuda, British Virgin Islands, Cayman Islands and Turks & Caicos Islands).
- Its membership is open to any other State or Territory of the Caribbean Region.
- First ever India- CARICOM leaders' summit was recently held.
- India announced a \$14-million grant for community development projects and \$150 million Line of Credit for solar, renewable energy and climate-change related works.



### **SCO's Eurasian Economic Forum**

- India skipped a meeting of the 'Eurasian Economic Union' (EAEU), which was organised by **SCO** in China.
- India has been a member of the 'Shanghai Cooperation Organisation' (**SCO**) since 2017.
- The entire event is foreshadowed by the China's 'Belt and Road Initiative' (**BRI**).
- In 2018, China and Russia in the 23<sup>rd</sup> annual meeting between heads of government both sides expressed,
  1. Willingness to dovetail the China's **BRI** and Russia's 'Eurasian Economic Union'.
- The BRI is a mammoth infrastructure project unveiled by China which plans to connect Asia, Europe, and Africa.
- The 'China-Pakistan Economic Corridor', an important part of the **BRI**, passes through Pakistan Occupied Kashmir (PoK).
- So, India strongly opposed the BRI, as no country can accept a project that ignores its core concerns on sovereignty and territorial integrity.
- This made India to skip the SCO's Eurasian Economic Forum as the entire event is foreshadowed by **BRI**.

## **21. INTERNATIONAL ISSUES AND EVENTS**

### **Specially Designated Global Terrorist**

- Recently, US has designated the leader of the Tehreek-e-Taliban Pakistan, Mufti Noor WaliMehsud, as a Specially Designated Global Terrorist (**SDGT**).
- He is believed to have fought against the North Alliance alongside Afghan Taliban before the US invaded Afghanistan.
- Individuals or entities designated as SDGTs have either,
  1. already taken part in terrorist activities or
  2. believed to be potential threats by the Office of Foreign Assets Control (OFAC) of the US Department of the Treasury.
- An individual is designated as an **SDGT** by the US under the provisions of **Executive Order 13224**.
- The Order 13224 was issued by President George W Bush in 2001, and which has been renewed annually thereafter.
- It was issued in the aftermath of the 9/11 attacks aimed at Blocking Property and Prohibiting Transactions with Persons Who Commit, Threaten To Commit, or Support Terrorism.
- Individuals acting as a part of terrorist organisations and financiers of these groups can be designated as SDGTs.



- Once an individual or an entity is designated an SDGT, their assets in the US or their possessions held by US persons are frozen or blocked.
- This includes leaders of terrorist organisations and individuals who have participated in terrorism-related training activities.
- Apart from SDGT, terrorist groups can be designated as “Foreign Terrorist Organisations” (**FTOs**) under the ‘Immigration and Nationality Act of 1965’.

## 22. ECONOMY

### Floor Space Index

- The Maharashtra Government has unveiled a slew of measures to boost the flagging realty sector in the State.
- It has offered significant cuts in builders’ fees for availing Floor Space Index (**FSI**) for their projects.
- ‘Floor Space Index’, also known as ‘Floor Area Ratio’ (**FAR**), is the maximum area that can be constructed on a plot of land.
- It is the ratio of total floor area of a building (Built up area) to the total Plot area (land).
- For instance,
  - On 1,000 square feet of land with the **FSI 1.5**
  - then build up area could be up to 1,500 sq.ft of covered structures on the plot.
  - Apartments can be built comprising 1 or 2 floors or a single dwelling unit on the plot, but not beyond 1,500 sq.ft.
  - The constructed area would include staircases and other basic structures.
- It is regulated by the municipal or local authorities of the respective State government.
- **FSI** norms are usually set based on the National Building Code.
- The fees paid to the government for this construction is known as FSI fees.
- If a developer wants to build over and above the FSI limit, the authorities give permission to do so for an additional fee. This is termed as ‘Premium FSI’.
- A developer can utilise the area (above FSI limit) for providing additional amenities such as flower bed, gardens, balcony.
- Higher FSI for an area indicates greater building volume.
- FSI is the most crucial among all the regulations in development planning.
- FSI limit helps regulate vertical building growth and living conditions, while accommodating the burgeoning population.
- Water supply adequacy, sewerage system, solid waste disposal and road capacity are also taken into consideration in **FSI**.
- This is why FSI varies with each State and each region within a State. FSI varies with the type of building as well.
- Increase in **FSI** - For **Land-owners**, Usually peg up the value of land available for sale.
- Increase in **FSI** - For **home buyers**,
  - This would mean more residents needing to share common amenities such as lifts, pools, clubs, electricity and water.
  - This is particularly in high-density buildings and the maintenance cost in such cases could also go up.
  - But **FSI** increases in the outskirts of a city may lead to lower property prices.

$$\text{FSI} = \frac{\text{Floor space covered in all floors}}{\text{Area of the plot}}$$

- The builders may lower the price to stimulate demand for homes in these areas.

### ***The Federal Reserve Interest Rates***

- The Federal Reserve, the US central bank, is expected to cut its main interest rates.
- If it does, the aim will be to stimulate the US economy and get inflation closer to the Fed's target.
- An oil price spike after attacks on Saudi Arabian oil facilities added to the list of risks facing an economy.
  1. Already the economy is slowed by ongoing trade tensions and global weakness.
- Fed policy impact on the rest of the world,
  1. US economy's performance is important for the rest of us.
  2. If the Fed gets it wrong, the US could end up underperforming.
  3. This would be bad news for many other countries.
  4. It can have an impact through financial markets by affecting exchange rates, international interest rates.
- Cuts in interest rates in any country tend to make its currency lose value against others,
  1. That is because lower interest rates mean there is less money to be made by investing in assets, such as government bonds.
  2. If investors are less keen to buy, for example US government bonds, they have less demand for the currency needed to buy.
  3. So the currency concerned, the dollar in this case, tends to lose value.
  4. That in turn will make other countries less competitive against goods that are priced in US dollars.
  5. But it also helps slow inflation by making dollar-priced goods cheaper in other countries' currencies.
- Impact on International investment,
  1. When a large economy such as the US changes its interest rates, it is possible for the movement of investment funds to be disruptive.
  2. As interest rates are likely to be cut, it is more likely that money will go into emerging economies.
  3. That can sometimes lead to financial instability (or unsustainable bubbles).
  4. It is a reason why countries need to keep a careful eye on what happens in the US.

## **23. ENVIRONMENT**

### ***COP14 of UNCCD***

- India takes over COP Presidency of **UNCCD** from China for next two years.
- Through hosting COP 14, India will highlight its leadership in navigating the land management agenda at global level.
- It will also provide a stage to mainstream sustainable land management in country's national development policies.
- The key outcomes of COP 14 will facilitate in delivering convergence and synergies among the existing programmes,
  - in the field of agriculture, forestry, land, water management and poverty alleviation.
- It will cater the need to achieve the SDGs and focused vision of Doubling the Farmer's Income by 2022.
- The Conference is being attended by delegates from 197 parties comprising of,
  1. Scientists and representatives of national and local governments.
  2. Global business leaders, NGOs, gender-based organisations, youth groups, journalists, and faith and community groups.



3. They will share their expertise and give an overview to achieve their goals at the Conference.
- The objective of the COP 14, accompanied with 'Committee on Science and Technology' (CST 14) and Committee to Review the Implementation of the Convention (CRIC 18) is to,
  1. Discuss on various issues of land such as sustainable land management, reversing land degradation, mitigating drought.
  2. Addressing sand and dust storms, linkages with gender, tenure, etc. and
  3. To guide the Convention as global and national circumstances needs change.

#### **United Nations Convention to Combat Desertification**

- **UNCCD** was adopted in Paris on 17 June 1994 and ratified by 196 countries & European Union.
- India ratified the UNCCD Convention on December 1996.
- **UNCCD** called as "Mother convention" along with other 2 Conventions emerged at 1992 Rio Earth Summit. The other 2 are,
  1. United Nations Framework Convention on Climate Change (**UNFCCC**) and
  2. Convention on Biological Diversity (**CBD**).
- It is committed to a bottom-up approach, encouraging the participation of local people in combating desertification and land degradation.

#### **Drought-forecasting toolbox**

- 'Drought-forecasting toolbox' was unveiled at **UNCCD COP14** event.
- It aims to track, assess and deliver relevant information concerning climatic, hydrologic and water supply trends.
- It is a kind of knowledge bank that may be used by vulnerable countries, including India,
  1. To reduce drought risk, be better prepared and effectively respond to it.
- It is developed through the close partnership among,
  1. UNCCD,
  2. World Meteorological Organisation (WMO),
  3. Food and Agriculture Organisation (FAO) and global bodies.
- It also provides the stakeholders,
  1. Easy access to case studies and other resources to support action on drought preparedness
  2. It aims to boost the resilience of people and ecosystems to drought.
- It will help the countries in framing their respective national drought policies in due course based on monitoring, forecast, and early warning.

#### **New Delhi Declaration**

- The declaration was adopted by the participating countries at the 14<sup>th</sup> CoP to the **UNCCD**.
- It comes with an action plan to save the planet from losing more land and to achieve SDG target of land degradation neutrality by 2030.
- The parties expressed support for new initiatives to improve human health, well-being and to advance peace and security.
- The declaration also stated that,
  - World needs to consider land-based solutions for climate action and
  - Biodiversity conservation to achieve the long-term goals of the Paris Agreement.
- It also special emphasis on,
  - Community-driven transformative projects,
  - That are gender-sensitive at local, national and regional levels to drive implementation.

### **Bamboonomics**

- Ministry of Tribal Affairs launched the biggest Tribal movement, to promote tribal enterprise through 'Bamboonomics'.
- It was launched for combating desertification and the climate change at COP 14 to the **UNCCD**.
- **TRIFED** introduced the 'The 4P1000 Initiative: The Tribal Perspective through Bamboonomics'.
- The international initiative "4 per 1000" was launched by France in 2015 at the COP 21.
- The aim of the initiative is to,
  - Demonstrate that agriculture, and in particular agricultural soils can play a crucial role where food security and climate change are concerned.
- The ambition of the initiative is to,
  - Encourage stakeholders to transition towards a productive, highly resilient agriculture,
  - based on the appropriate management of lands and soils,
  - creating jobs and incomes hence ensuring sustainable development.
- An annual growth rate of **0.4%** in the soil carbon stocks, or **4%** per year, in the first 30-40 cm of soil,
  - would significantly reduce the CO<sub>2</sub> concentration in the atmosphere related to human activities.
  - This is what the 4 per 1000 Initiative proposes, soils for food security and climate.
- The initiative is intended to complement those necessary efforts to reduce greenhouse gas emissions globally.
- It is voluntary, it is up to each member to define how they want to contribute to the goals.

### **Global Climate Strike Movement**

- Students in more than 2,000 cities across the world are holding demonstrations under the **#FridaysforFuture** movement.
- The **#FridaysforFuture** movement, also known as the 'Youth Strike for Climate Movement', started in August 2018.
- It was started by Swedish student 'Greta Thunberg', who skipped school to protest outside parliament for more action against climate change.
- 'Thunberg' called for a strike every Friday until the Swedish parliament revised its policies towards climate change.
- Gradually, students and adults from across the world started mobilising and demonstrating in front of parliaments and local city halls in their respective countries.
- Thousands of events are planned from September 20<sup>th</sup> to 27<sup>th</sup>,
  - Millions of students to walk out of classrooms, workplaces and homes,
  - to join together in the streets and demand climate action and climate justice.
  - The strikes are registered to take place in over 2,350 cities.
- In India, strikes have been scheduled in New Delhi, Chennai, Pune, Mumbai, Phagwara (Punjab), Nagercoil (Tamil Nadu), Kishangarh (Rajasthan) and several other places.
- Students are demanding 'urgent', 'decisive' action to keep global average temperatures from rising above 1.5 degree Celsius.
- The global strikes will commence just as the "UN Climate Action Summit 2019" set to take place in New York on September 23, where Thunberg has been invited.
- These global school movements have been supported by scientists as well.
- The sentiments behind these school student movements are
  - The "broken promises" of older generations,
  - Members of which continue to extract and use fossil fuels,

- leading to increased CO<sub>2</sub> emissions and
- subsequently, increasing average global temperatures.
- Thunberg sailed through transatlantic, from Britain to the United States to take part in a United Nations climate summit.

### **Global Solar Park**

- The global solar park was inaugurated at UN headquarters by the Indian Prime Minister during the Gandhi@150 commemorative event.
- It has 193 solar panels, each representing a member of the multilateral body.
- It is a roof-top solar park which has the capacity of 50-kilowatt hour (kWh) for each panel and the total output is 86,244 KWh.
- This equals 61 metric tonnes of carbon dioxide, 30,242 kg of coal burned, and carbon sequestered from 1,008 tree seedlings grown for 10 years.
- It was built at the cost of US \$1 million.
- India is the third largest emitter of greenhouse gases, after China and the US.
- Coal power, cattle and paddy are major sources of emission, though per capita emissions are roughly a seventh of the US and less than half the world average.
- India has pledged for a 33-35% reduction in emission intensity (emissions associated with each unit of economic output) by 2030, compared to 2005 levels in Paris agreement.
- India will host the 2nd general assembly of the International Solar Alliance, in New Delhi on the sidelines of COP-21, the UN Climate Conference.

### **Forest-PLUS 2.0**

- Union Environment Ministry and US Agency for International Development (USAID) has launched Forest-PLUS 2.0.
- It is a 5-year programme that focuses on developing tools & techniques to bolster ecosystem management and harness ecosystem services in forest landscape management.
- It is a set of pilot projects meant to enhance sustainable forest landscape management.
- Previously, Forest-PLUS was completed in 2017. Forest-PLUS 2.0 was initiated in December 2018.
- Achievements of Forest-PLUS –
  - i. Promotion of bio-briquettes in Sikkim,
  - ii. Introduction of solar heating systems in Rampur and
  - iii. Development of an agro-forestry model in Hoshangabad
- Forest-PLUS 2.0 - It comprises pilot project in 3 landscapes - Gaya in Bihar, Thiruvananthapuram in Kerala and Medak in Telangana.
- These sites were chosen for the contrast in their landscapes – Bihar (Forest deficit area), Telangana (Relatively drier area) and Kerala (Rich in Biodiversity).
- 3 Focal points of action under the programme are,
  - i. Developing tools for multiple services in forests management
  - ii. Instruments for leveraging finance & mobilising investment from the private sector
  - iii. Economic opportunities for forest-dependent people.

### **Climate change and Bananas**

- A new study has found that climate change has benefited Bananas over the last several decades.
- It also predicted that the trend will reverse, with climate change eventually causing a negative impact.

- Bananas are recognised as the most important crop, providing food, nutrition and income for millions across the globe.
- It thrive in warmer climates and India is the world's largest producer and consumer of the fruit crop.
- The study found that 27 countries, accounting for 86% of the world's dessert banana production.
  1. These countries have, on an average seen increased crop yield since 1961 by 1.37 tonnes/hectare every year.
  2. It was due to the changing climate resulting in more favourable growing conditions.
- In India, data from the National Horticulture Board show broadly consistent yields in 6 years.
- The study says the gains in these 27 countries could be significantly reduced by 2050 to 1.19-0.59 tonnes/hectare.
- The study predicts that 10 countries, including India could see a significant decline in crop yields.
- On the other hand, that some countries including Ecuador (the largest exporter), Honduras and a number of African countries may see an overall benefit in crop yields.

BANANA YIELD IN INDIA (TONNES/HECTARE)	
2011-12	35.7
2012-13	34.2
2013-14	37.0
2014-15	35.5
2015-16	34.6
2016-17*	34.0

\*Provisional  
Source: National Horticulture Board



### ***Cryodrakon Boreas (Cold dragon of the North Winds)***

- Paleontologists have identified a new species, named it 'Cryodrakonboreas' - a giant flying reptile.
- With a wingspan of over 10 metres, it is believed to have flown over the heads of dinosaurs.
- It could be one of the largest flying animals lived over 77 million years ago in today's western Canada.
- Its remains were, discovered 30 years ago from the Dinosaur Park Formation located in Alberta.
- A new study has concluded that the remains belong to a new species, which is the first pterosaur to be discovered in Canada.
- In terms of habitat and lifestyle, it would have lived in a tropical environment, feasting on small dinosaurs and lizards.



### ***Zero-budget Farming***

- Addressing the COP14 to the UNCCD, PM mentioned that India is focusing on Zero Budget Natural Farming (ZBNF).
  - **ZBNF** is a farming technique that seeks to bring down input costs for farmers,
    1. by encouraging them to rely upon "Natural products"
    2. rather than spending money on pesticides and fertilisers.
  - The concept behind ZBNF is that over **98%** of the nutrients required by crops for photosynthesis,
    1. Carbon dioxide, Nitrogen, Water and solar energy are already available free from the air, rain, and Sun.
    2. Only the remaining 1.5% to 2% nutrients need to be taken from the soil, and
    3. Convert from "non-available" to "available" form through the action of 'Microorganisms'.
  - To help the microorganisms act, farmers must apply,
    1. 'Jiwamrita' (microbial culture)
    2. 'Bijamrita' (seed treatment solution),

3. 'Mulching' (covering plants with a layer of dried straw or fallen leaves) and
  4. 'Waaphasa' (giving water outside the plant's canopy)
  5. to maintain the right balance of soil temperature, moisture, and air.
- To manage insects and pests, **ZBNF** recommends the use of 'Agniastra', 'Brahmastra' and 'Neemastra'.
    1. These are based mainly on urine and dung of cow breeds.
    2. These too, need not be purchased, so farming remains practically "Zero-budget".
  - However, Scientists claims that there is no authenticated results from any experiment for it to be considered a feasible technological option.
  - **ICAR**, India's national network of agricultural research and education institutes, has appointed a committee under 'Praveen Rao Velchala', to study the viability of **ZBNF**.

### **Happy Seeder (HS) and its effects on Wheat yield**

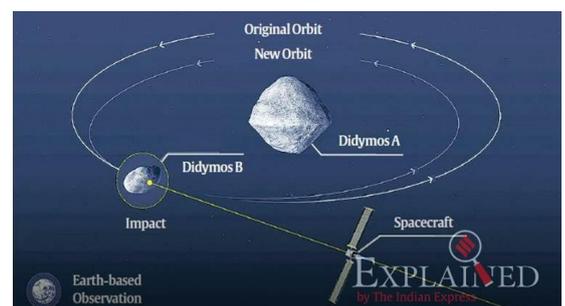
- Recently, Punjab C.M faced opposition from farmers, when he said that, using 'Happy Seeders' (HS) for direct wheat sowing leads to increased productivity, hence farmers must 'stop burning paddy stubble' to clear the fields.
- 'Happy Seeder' (HS) or 'Turbo Happy Seeder' (THS) is a tractor-operated machine.
- It is developed by the Punjab Agricultural University (PAU) in collaboration with Australian Centre for International Agricultural Research (ACIAR).
  1. It is for in-situ management of paddy stubble (straw).
- It costs around Rs 1.50 to 1.60 lakh and is manufactured by different companies.
- The agriculture department gives 80% subsidy to farmer groups and 50% subsidy to individual farmers.
- The average wheat yields a farmer gets using traditional sowing method (after burning stubble) is 19-22 quintal/acre.
- By using Happy Seeder, in the first year, the yield was 17 q/acre but after that it's increased to 19-22 q/acre.
- Initially, farmers face problems because after sowing with HS, fields require proper management.
- According to farmers, Happy Seeder doesn't work on thick bunches of straw left behind, so it made them to burn stubble.
- According to experts, wheat yield will start increasing after 2-3 years, as the stubble will add to the organic quality of the soil.

## **24. SCIENCE AND TECHNOLOGY**

### **SPACE**

#### **Deflecting an Asteroid**

- NASA's DART mission, aims to deflect 'Didymos B', the "moonlet" of the Didymos asteroid system.
- It is an ambitious double-spacecraft mission to deflect an asteroid in space.
- It is to prove the technique as a viable method of planetary defence.
- Among all the causes that may cause extinction of life on Earth, an asteroid hit is widely acknowledged as one of the likeliest.
- The mission, includes NASA and the European Space Agency, is known as the 'Asteroid Impact Deflection Assessment' (AIDA).
- The target is the smaller of two bodies in the "Double



Didymos asteroids” that are in orbit between Earth and Mars.

- Didymos is a near-Earth asteroid system.
- Its main body measures about 780 m across, the smaller body is a “moonlet” about 160 m in diameter.
- The project aims to deflect the orbit of the smaller body through an impact by one spacecraft.
- Then a second spacecraft will survey the crash site and gather the maximum possible data on the effect of this collision.
- NASA is building the Double Asteroid Impact Test (DART) spacecraft for launch in summer 2021.
- It is planned to collide with the target at 6.6 km/s in September 2022.
- Flying along with DART will be an Italian-made miniature CubeSat, called **LICIACube**, to record the moment of impact.
- ESA’s contribution is a mission called ‘Hera’, which will perform a close-up survey of the post-impact asteroid.

### ***James Webb Space Telescope (JWST)***

- NASA's James Webb Space Telescope has been fully assembled.
- It is the successor to the ‘Hubble observatory’ and is scheduled to launch into space in March 2021.
- The JWST won’t just replace Hubble, it will massively expand our ability to observe distant objects.
- Once put in space, the telescope will explore the cosmos, planets and moons within our solar system.
- It will also explore the most ancient and distant galaxies using infrared light.
- It is funded by NASA in conjunction with the European Space Agency (ESA) and the Canadian Space Agency (CSA).
- It will also have the power to analyse the atmospheres of many the new planets, for the potential for life.
- After launch, it will head near the Earth-Sun ‘**L2**’ Lagrange point almost a million miles away (1.5 million kilometers).

### ***Avalanche on Mars***

- NASA's ‘Mars Reconnaissance Orbiter’ (MRO) captured dust cloud from an avalanche of ice blocks on North Pole of Mars.
- The photo of the avalanche was captured by onboard ‘High Resolution Imaging Science Experiment’ (HiRISE) camera.
- According to NASA, every spring the sun shines on the side of North Pole of Mars known as the north polar layered deposits.
- This warmth destabilises the ice blocks, break loose which causes Avalanche.
- Avalanches can also be caused by a number of things on Mars surface.
  1. In June 2018, NASA’s orbiter was able to spot an avalanche, caused by a meteoroid impact on Mars.
  2. The meteoroid crashed on a slope, it destabilized it and caused an avalanche of dirt and dust.

### ***Mars Reconnaissance Orbiter (MRO)***

- **MRO is a multipurpose spacecraft of NASA designed to conduct reconnaissance** and exploration of Mars from orbit.
- Launched in 2005, it carried instruments for studying the atmosphere of Mars and to search for signs of water on planet.
- The scientific goals of MRO, according to NASA, are
  1. Search for evidence of past or present life in Mars.
  2. Understand the climate and volatile history of Mars.



3. To Characterize the geology of Mars.
- To accomplish these goals, MRO carries multiple instruments and it has 3 cameras,
  1. High Resolution Imaging Science Experiment (HiRISE)
  2. Context Camera (CTX)
  3. Mars Color Imager (MARCI)
- MRO has also has,
  1. A spectrometer called 'Compact Reconnaissance Imaging Spectrometer for Mars' (CRISM),
  2. A radiometer called the 'Mars Climate Sounder' (MCS), and
  3. A radar instrument called 'Shallow Radar' (SHARAD).

### **K2-18b**

- '**K2-18b**' is an 'exoplanet' discovered in 2015 by NASA's 'Kepler spacecraft'.
- Now, scientists have found signatures of 'Water vapour' in the atmosphere of **K2-18b**.
- This makes it the only planet outside Solar system with temperatures and water vapour that can potentially support life.
- It is about 110 light years from Earth, and 8 times the mass of Earth, orbits a star.
- It resides in a habitable zone, the region around a star in which liquid water could potentially pool on surface of a rocky planet.
- **K2-18b** is not 'Earth 2.0' as it is significantly heavier and has a different atmospheric composition.
- The researchers used data from the 'Hubble Space Telescope' and analysed the **K2-18b**'s atmosphere.
- The results revealed the molecular signature of water vapour, indicating, presence of hydrogen and helium in its atmosphere.

### **Interstellar objects**

- In 2017, The Haleakala Observatory in Hawaii spotted a strange, spaceship-shaped object passing through the Solar System.
- It was named "**Oumuamua**", it became the subject of speculation whether it was really an alien spaceship.
- It was eventually declared by scientists to be an interstellar object, the first such known visitor to the Solar System.
- Now, it appears that a second interstellar object is paying a visit.
- On August, the MARGO observatory in Crimea spotted a comet and is believed to have originated from outside the Solar System,
  - although the official confirmation has not been made yet.
- The comet has been designated "**C/2019 Q4 (Borisov)**".
- It is still inbound toward the Sun. It will remain farther from Earth than the orbit of Mars.
- It was detected by NASA's Jet Propulsion Laboratory (**JPL**), Scout system.
- **JPL** automatically flagged the object as possibly being interstellar.
- The comet's current velocity is about 150,000 kph, which is well above the typical velocities of objects orbiting the Sun.
- The high velocity indicates that the object likely originated from outside our Solar System and head back to interstellar space.

### **Sagittarius A**

- It is a supermassive black hole sits 26,000 light years away from Earth, near the ‘Galactic Centre’ or the centre of the ‘Milky Way’.
- Since the discovery of **Sagittarius A** 24 years ago, it has been fairly calm.
- This year, however, **Sagittarius A** has shown unusual activity, and the area around it has been much brighter than usual.
- Reason for this unusual activity,
  1. Sagittarius A may become hungrier and has been feeding on nearby matter at a faster rate, it is described as a “**Big feast**”.
  2. A black hole does not emit light by itself, but the matter that it consumes can be a source of light.
  3. Sagittarius A could be growing faster than usual in size.
  4. The current model that measures its level of brightness maybe inadequate and is in need of an update.
- Another possibility involves a bizarre object known as **G2**.
  1. It is most likely a pair of binary stars, which made its closest approach to the black hole.
  2. It is possible the black hole could have stripped off the outer layer of G2.
  3. This could help explain the increased brightness just outside the black hole.

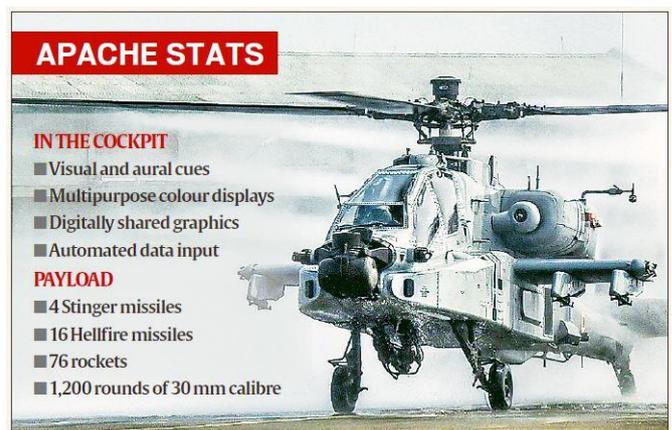
### **Naming of an Asteroid**

- International Astronomical Union (IAU) serves as the internationally recognized authority for assigning designations to celestial bodies and surface features on them.
- According to IAU’s guidelines, the privilege of naming a planet is first given to discoverers, who have 10 years to propose a name.
- The discoverer or team is expected to write a short citation, explaining the reasons for assigning the name.
- All names proposed are judged by the 15-member Working Group for Small Body Nomenclature (CSBN) of the IAU.
- It has recently named an asteroid after **Indian classical singer Pandit Jasraj**.
- It is located between Mars and Jupiter, and was discovered on November 11, 2006 by the Arizona based telescope.

### **DEFENCE**

#### **Apache Helicopter**

- Eight US made Apache AH-64E stealth attack helicopters, has been inducted into IAF.
- The IAF has signed a contract with ‘The Boeing’ and the US government for 22 Apache attack helicopters.
- Apache is the most advanced multi-role heavy attack helicopter in the world.
- Its modern capabilities includes, fire-and-forget, anti-tank missiles, air-to-air missiles, rockets, and other ammunition.
- Apaches has their ability to operate at much higher altitudes, unlike the aging Russian Mi-24/Mi-35 attack helicopters.
- It also has modern electronic warfare capabilities to provide versatility in network-centric aerial warfare.
- It carries a 30 mm chain gun with 1,200 rounds as





part of the area weapon subsystem.

- The helicopter carries the fire control Longbow radar, which has 360-degree coverage.
- It also has a nose-mounted sensor suite for target acquisition and night-vision systems.
- The Radar systems in the helicopter will enhance the capability of the IAF in providing integrated combat aviation cover.
- It is day/night, all weather capable, and have high agility and survivability against battle damage.
- These are easily maintainable even in field conditions, and are capable of prolonged operations in tropical and desert regions.

### ***Tejas - Light Combat Aircraft (LCA)***

- The naval variant of the **LCA Tejas** has made a first successful “Arrested landing” test.
- “Arrested landing” means to rapidly decelerate an aircraft as it lands.
- In about 2 seconds, Tejas decelerated from 244 km/hr to standstill by,
  1. Snagging the wire on the test runway with the hook attached to the jet's fuselage.
- The Tejas will need to replicate this, out at sea when it attempts to land on the deck of India's only operational aircraft carrier, **INS Vikramaditya**.
- An "arrested landing" on the deck of an aircraft carrier is a feat achieved by,
  1. only a handful of fighter jets developed in the US, Russia, the UK, France and China.
- The aircraft has to land on a 100-metre runaway on an aircraft carrier (a normal LCA lands on a one-kilometre runway).

### ***Astra Missile***

- Air-to-Air missile, **ASTRA**, has been successfully flight tested from Su-30 MKI as a part of User trials.
- It was indigenously designed and developed by the **DRDO**.
- It is capable of engaging targets of different ranges and altitudes.
- It is beyond Visual Range Air-to-Air Astra missile with a range of over 70 kms.
- Modifications of the Sukhoi-30 MKI jets to accommodate Astra missiles has been carried out by Hindustan Aeronautics Limited.
- The main purpose of astra is to replace the R77 from IAF.
- Being a 5<sup>th</sup> Generation missile, it would provide true beyond visual range capability with greater strategic depth.
- It is smoke free, having two way data link, it provides very less chances to enemy to be alert about it.
- The Astra missile is developed as part of the Integrated Guided Missile Development Programme (**IGMDP**).
- DRDO carried out mission analysis, system design, simulation and post-flight analysis of the weapon system.

### **OTHERS**

#### ***Russian-built Floating Nuclear Plant***

- “**Akademik Lomonosov**”, the first floating nuclear plant to be built in the world completed its 5000-km journey.
- It cause an excitement in the energy sector, but sparking fears among environmentalists over the safety of the Arctic region.
- The floating plant contains two nuclear reactors of 35 MW each.
- It is a small plant compared to conventional land-based nuclear projects.



- The plant will supply electricity to the Chukotka region, where important Russian national assets such as oil, gold, and coal reserves are located.
- Environmental groups such as Greenpeace Russia have criticised the project as a “Chernobyl on Ice” and a “Nuclear Titanic”.
- Activists fear that any accident aboard the plant could cause great damage to the fragile Arctic region.
- A recent nuclear accident in Russia after which there was a brief spike in radiation levels has added to the fears.
- The radiation fallout from the Fukushima nuclear disaster in Japan is also cited as a reason to not rush into such projects.

### ***Hydrogen-powered vehicles over Electric vehicles***

- China, Japan and South Korea have set ambitious targets to put millions of hydrogen-powered vehicles on their roads.
- But, Hydrogen fuel cell vehicles (**FCVs**) have been upstaged by electric vehicles (**EVs**).
- It becomes a mainstream option due to the success of Tesla Inc’s luxury cars as well as sales and production quotas set by China.
- Critics argue **FCVs** may never amount to more than a niche technology.
- But proponents counter hydrogen is the cleanest energy source for autos available and with time, it will gain acceptance.
- China, far and away the world’s biggest auto market is aiming for more than 1 million **FCVs** in service by 2030.
- Japan, a market of more than 5 million vehicles annually, wants to have 800,000 **FCVs** sold by that time.
- Resource-poor Japan sees hydrogen as a way to greater energy security.
- Driving ranges and refuelling times for FCVs are comparable to gasoline cars,
  1. whereas EVs require hours to recharge and provide only a few hundred kilometres of range.
- In general, hydrogen is seen as the more efficient choice for heavier vehicles that drive longer distances.
- However, lack of refuelling stations which are costly to build, is usually cited as the biggest obstacle to widespread adoption of **FCVs**.
  - Consumer worries about the risk of explosions are also a big hurdle.
  - Residents in Japan and South Korea have protested against the construction of hydrogen stations.
  - This year, a hydrogen tank explosion in South Korea killed 2 people, followed by a blast at a Norway hydrogen station.
- Heavy subsidies are needed to bring prices down to levels of gasoline-powered cars.
- Automakers contend that once sales volumes increase, economies of scale will make subsidies unnecessary.

### ***Indigenous Fuel Cell System***

- Council of Scientific and Industrial Research (CSIR) has unveiled the first indigenous high temperature fuel cell system.
- It was launched in partnership with Indian industries under the flagship programme “New Millennium Indian Technology Leadership Initiative (NMITLI)”.
- A fuel cell is an electrochemical device which directly converts the chemical energy of a fuel into electrical energy.
- In a fuel cell, the fuel and the oxidant, which is usually oxygen or air, are supplied continuously from an external source and power is also drawn continuously.



- In a conventional battery, on the other hand, the fuel and the oxidant are contained within and when these reactants are consumed the battery must be replaced or recharged.
- A high temperature fuel cell using a solid oxide electrolyte, and operated at temperatures above 700°C, is a highly efficient energy conversion device utilizing primarily gaseous fuels like H<sub>2</sub> and CO.
- It can also be operated in the reverse manner as a high temperature steam electrolyser to produce hydrogen.
- It would replace Diesel Generating (DG) sets and help reduce India's dependence on crude oil.

### ***Kalam Centre for Science and Technology***

- A Memorandum of Understanding (MoU) was signed between Ministry of Defence and Central University of Jammu for the establishment of Kalam Centre for Science and Technology.
- It will be equipped with state-of-the-art facilities and equipment leading to increase scholars in computational system security and sensors.

## **HEALTH**

### ***Influenza classification***

- Recently, India was again declared free of H5N1 virus, which causes 'avian influenza' or 'Bird flu' (earlier declaration in 2017).
- **WHO** defines influenza as a contagious, acute respiratory illness caused by influenza viruses.
- The many kinds of viruses causing influenza are identified by a standard nomenclature issued by the WHO in 1980.
  1. It is of four types, A, B, C, and D.
- According to the US Centers for Disease Control and Prevention (CDC), only 'influenza A and B viruses' are known to cause '**epidemics**'.
  1. The 'C type' virus usually causes mild respiratory illness.
  2. The 'D type' virus typically affects cattle and is not known to infect humans.
- Influenza is known to kill 6.5 lakh people every year, especially young children, elderly, pregnant women or those with vulnerable immune systems.
- Only the 'Influenza A virus' is divided into subtypes, based on two proteins on the surface of the virus,
  1. Hemagglutinin (**H**) and Neuraminidase (**N**)
  2. Hemagglutinin has **18** further subtypes while
  3. Neuraminidase has **11**.
  4. They are named from H1 to H18 and N1 to N11 in a sequential system.
- Humans can be infected with avian, swine and other zoonotic influenza viruses.
  1. Avian influenza subtypes - A(H5N1), A(H7N9) and A(H9N2).
  2. Swine influenza subtypes - A(H1N1), A(H1N2) and A(H3N2).
- Novel strains of the **H1N1** virus have appeared in 1918, 1957, 1968 and most recently in 2009.
- **WHO** designated global 'bird flu' outbreak in 2009 as '**Pandemic**'.

#### **Epidemiological Terms to know**

- **Endemic** - A disease that exists permanently in a particular geographical region or population.
- **Epidemic** - An infectious disease spreads rapidly to many people at about the same time.
- **Pandemic** - An epidemic spreads throughout the world.
- **Outbreak** - refers to the number of cases (disease) that exceeds what would be expected.

### ***African Swine Fever (ASF)***

- An **ASF** outbreak has been sweeping through swine populations in **China**, leading to massive mass cullings.



- This subsequently increased the price of the country's favourite protein.
- **ASF** is a highly contagious and fatal animal disease that infects domestic and wild pigs.
- It is a severe 'viral disease' of pigs that can spread very rapidly in pig herds.
- The disease occurs in many African countries, outbreaks have also occurred in Central and Eastern Europe, Eurasia and China.
- **ASF** virus infects the herds in a number of ways,
  1. Often through the feeding of uncooked/undercooked contaminated food.
  2. Through the bites of soft-bodied ticks, lice and flies.
  3. Through inoculation with contaminated syringes and use of contaminated surgical equipment.
- The virus is then easily spread between pigs by,
  1. Direct contact with an infected animal,
  2. From its body fluids (nasal, oral, feces, blood) or
  3. Indirectly from contact with contaminated objects.
  4. Some species of 'ticks' (vector) can transmit the virus.
  5. Blood sucking flies or insects may possibly spread the virus between pigs.
- The fever has no cure, no approved vaccine, the only way to stop it spreading is by culling the animals.
  1. So over 5 million animals have been culled in China since August 2018.
  2. Philippines, world's 7<sup>th</sup> largest pork importer and 10<sup>th</sup> largest pork consumer culled more than 7,000 pigs.
- **ASF** is not a threat to human beings since it only spreads from animals to other animals.
- According to **FAO** of **UN**, **ASF** affected countries includes,
  1. China, Vietnam, Mongolia, Cambodia, North Korea, Laos, and Myanmar, The Philippines.
- It affected small farmers in China who do not have the resources to protect their pigs from the disease.
- China has over 2.6 crore pig farmers, half of its production of pork is undertaken by small-scale farmers.
- Pork is also a culturally significant meat for the Chinese people, symbolic of a family's well-being.

### ***Eradicating Malaria by 2050***

- A report in 'The Lancet' concludes that it is possible to eradicate malaria as early as 2050 or within a generation.
- It requires the right strategies and sufficient funding.
- Since 2000, global malaria incidence and death rates declined by 36% and 60%, respectively.
- Today, more than half of the world's countries are malaria-free.
- However, Malaria cases are rising in 55 countries in Africa, Asia and Latin America.
  1. Over 200 million cases of malaria reported each year, claiming nearly half a million lives.
  2. Nigeria and Democratic Republic of Congo accounts for 36 % of global cases.
- Analyses indicate that socioeconomic and environmental trends, together with improved coverage of malaria interventions, will help to eradicate malaria as early as 2050.
- To achieve eradication by 2050, the report identifies 3 ways to accelerate the decline in malaria cases,
  1. The world must improve implementation of malaria control programmes.
  2. The world must develop and roll out innovative new tools to overcome the biological challenges to eradication.
  3. Malaria-endemic countries and donors must provide the financial investment needed.



### ***Bombay Blood Group***

- Recently, the ‘Bombay blood group’, a rare blood type, has been at the centre of attention in Mumbai’s healthcare scene.
- Demand for the blood type has coincidentally spiked at hospitals, but supply has been scarce.
- The 4 most common blood groups are **A**, **B**, **AB** and **O**.
- The rare, ‘Bombay blood group’ was first discovered in Mumbai in 1952 by Dr Y M Bhende.
- Each red blood cell has antigen over its surface, which helps determine which group it belongs to.
- The Bombay blood group, also called “**hh**”, is deficient in expressing antigen H, meaning the RBC has no antigen H.
- For instance, in the **AB** blood group, both antigens A and B are found.
  1. **A** will have A antigens, **B** will have B antigens.
  2. In **hh**, there are no A or B antigens.
- Globally, the **hh** blood type has an incidence of 1 in 4 million.
- It has a higher incidence in South Asia, in India, 1 in 7,600 to 10,000 are born with this type.
- This blood type is more common in South Asia than anywhere else because of inbreeding and close community marriages.
- It is genetically passed and shared common ancestry among Indians, Sri Lankans, Pakistanis and Bangladeshis.
  - This led to more cases of **hh** blood phenotype in this region.
- Often the **hh** blood group is confused with the **O** group.
- The difference is that the **O** group has **Antigen H**, while the **hh** group does not.
- The individuals with ‘Bombay blood group’ (**hh**) can only get blood from individuals of Bombay hh phenotype.
- In contrast, **hh** blood group can donate their blood to **A,B,O** blood types.

### ***National Animal Disease Control Programme (NADCP)***

- **NADCP** was launched recently, aimed at eradicating ‘Foot and Mouth disease’ (**FMD**) and ‘Brucellosis’ in livestock.
- India has the world’s largest livestock population of 125-crore plus heads but,
  1. The cattle productivity is low and animal diseases are a major concern.
  2. The diseases have resulted in some overseas markets being shut to Indian dairy and meat products.
  3. It prevented the industry from realising its income potential.
- **NADCP** programme aims to,
  1. Vaccinate over 500 million livestock heads, including cattle, buffalo, sheep, goats and pigs against FMD.
  2. Vaccinate over 36 million female bovine calves annually against Brucellosis.
  3. The programme has received 100% funding from the Centre, for 5 years until 2024.
  4. The NADCP aims to control these 2 diseases by 2025 and to eradicate them by 2030.
- **FMD (Foot and Mouth disease)**
  1. It is a highly infectious viral disease of livestock.
  2. It is generally not fatal in adult animals but leaves them severely weakened.
  3. It results in a drastically reduced production of milk.
  4. Therefore, it financially ruinous for dairy farmers.
  5. Infected animals get a fever, sores in their mouth, on their teats, and between their hooves.



6. It spreads through excretions and secretions, infected animals also exhale the virus.
7. It is endemic in several parts of Asia, most of Africa, and the Middle East.
8. Australia, New Zealand, Indonesia, Central, North and Latin America, continental Western Europe are **FMD-free**.

- **Brucellosis**

1. This is a zoonotic disease that is endemic in most parts of the country.
2. It causes early abortions in animals and prevents the addition of new calves to the animal population.
3. **WHO** recommends the vaccination of cattle and in some cases, testing and culling to control the disease.

### **Salmonella**

- Indian **MDH** sambar masala were recalled from retail stores in **US** after tests by the **US-FDA** showed positive for 'Salmonella'.
- **MDH** is a top Indian cooking brand which is selling various spice mixes that are key to Indian cooking.
- **Salmonella** is a group of '**bacteria**' that can cause food-borne illnesses known as **Salmonellosis**.
- It is commonly found in the intestines of humans and animals.
- It can also be found on raw meats, poultry, eggs and in unpasteurised milk.
- It causes an illness if 'live Salmonella bacteria' enters the body.
- The bacteria can attach to the cells lining the intestines where they produce toxins and attack the intestinal cells.
- According to estimates by the **US** 'Centers for Disease Control and Prevention' (**CDC**),
  1. Salmonella causes 1.2 million illnesses and about 450 deaths in the US every year.
  2. In a majority of these cases, food is the source of the illness.
- Individuals who develop salmonellosis may show symptoms such as nausea, diarrhoea, fever and abdominal cramps.
- Usually, the illness lasts for 4-7 days, and most people recover without treatment.
- In some cases the diarrhoea is severe and there is risk of it spreading from the intestines to other parts of the body.
- **WHO** identifies 'Salmonella' as one of four key global causes of diarrhoeal diseases.
- 'Salmonella bacteria' are widely distributed in domestic and wild animals.
- They are prevalent in food animals such as poultry, pigs, and cattle, as well as in pets, including cats, dogs and birds.
- 'Salmonellosis' in humans is generally contracted through the consumption of contaminated food of animal origin.
- It also pass through other foods, including green vegetables contaminated by manure.
- Person-to-person transmission can also occur through the faecal-oral route.

### **Dangers of artificial ripening of Fruits and Vegetables**

- Fruits are a good source of vitamins and minerals, and play an important role in preventing Vitamin C and A deficiencies.
- **WHO** recommends 5 servings of fruits and vegetables every day for a healthy living.
- However, health benefits of fruits depend on how they are ripened.
- The best course will be to allow them to ripen on the plant itself.



- The fruits become soft, change in colour and develop aroma with increase in sugar level and reduction in acid content.
- Many factors influence the process of ripening including temperature and relative humidity.
- It is not always possible to wait for the fruit to ripen naturally.
- More often than not, they need to be transported over long distances.
- If they had been harvested in a ripe stage, they get spoilt before reaching their destination.
- For such situations, farmers harvest them much before they get ripe.
- The traders then ripen them artificially at the destination using certain chemicals.
- Most fruits produce a gaseous compound called '**ethylene**' that starts the ripening process.
- Its level in under-ripe fruit is very low, but as the fruits develop, they produce larger amounts of the chemical that speeds up the ripening process.
- These enzymes convert complex polysaccharides into simple sugars and make the skin of the fruits soft.
- In artificial ripening, this process is mimicked using chemicals.
- The most commonly used chemical is called '**ethephon**' (2-chloroethylphosphonic acid).
- It penetrates into the fruit and decomposes ethylene.
- Another chemical that is regularly used is '**Calcium carbide**', which produces 'acetylene', which is an analogue of 'ethylene'.
- It is, however, fraught with several problems.
- Studies have shown that it breaks down the organic composition of vitamins and other micronutrients.
- Besides, it changes only the skin colour, the fruit remains raw inside.
- Industrial grade calcium carbide is often found contaminated with traces of arsenic and phosphorus which are toxic chemicals.
- The symptoms of arsenic and phosphorous poisoning include,
  1. Vomiting, diarrhoea with/without blood, weakness, burning sensation in the chest and abdomen, eye damage, ulcers.
- According to studies, Calcium carbide can also affect the neurological system.
- **FSSAI** has banned calcium carbide under the "Prevention of Food Adulteration (**PFA**) Act, 1954".
- To distinguish the artificially ripened fruit,
  1. They will have uniform skin colour in fruits like tomato, mango, papaya, and in the case of banana,
  2. The fruit will be yellow while the stem will be dark green.
  3. If the fruits are available before season, it could mean they are artificially ripened.
- Washing and peeling the fruits before eating can minimise the risks of calcium carbide.

#### **NIKSHAY**

- It is a web enabled application, which facilitates monitoring of universal access to TB patient's data by all concerned stakeholders.
- It has been developed jointly by the Central TB Division of the Ministry of Health and Family Welfare and National Informatics Centre (NIC).
- Two objectives –
  - i. To create database of all TB patients including Multi-Drug Resistant cases across the country,
  - ii. To use this database for monitoring and research purposes at all levels so that TB can be eradicated from India in an effective manner.

- The government launched the NikshayPoshan Yojana, a direct benefit transfer scheme, to provide nutritional support to TB patients.
- Under the scheme, TB patients receive ₹500 per month for the entire duration of treatment.
- According to the recent Tuberculosis India Report 2019 released by the Govt of India, the estimated TB incidence in India stands at 27 lakh.
- **Report Highlights** - TB burden in India is highest in Uttar Pradesh, followed by Maharashtra and Rajasthan, Gujarat and MP.
- The number of HIV-infected people who go on to develop Tuberculosis (TB) is increasing in India.
- TB is the leading cause of morbidity and mortality among People Living with HIV (PLHIV).
- In 2018, the Revised National Tuberculosis Programme (RNTBP) was able to achieve notification by 21.5 lakh persons, which is an increase of 16% as compared to 2017.

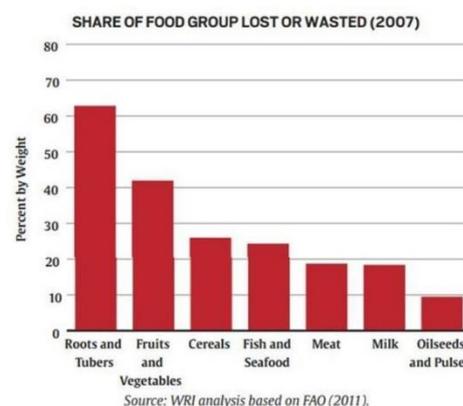
### LRRK2

- Leucine-rich repeat kinase 2 (LRRK2) is a kinase enzyme that protects the body against viral and bacterial infections by triggering inflammation like swelling, redness, heat and pain.
- According to a recent study, this enhanced inflammation can lead to collateral damage to the body.
- Inflammation caused by mutation in a gene can raise the risk of Parkinson's and Crohn's diseases as well as leprosy.
- Leprosy caused by infections characterised by lesions in the nerve endings of the skin.
- LRRK2, which causes excessive inflammation to defend body against a type of mycobacterium infects peripheral nerves, is thought to be behind leprosy.
- The findings are also important for ongoing clinical trials of Parkinson's drugs that can reduce excessive LRRK2 activity.
- However, total absence of LRRK2 function can make people more prone to infections.

## INDEX AND REPORT

### Report on food wastage

- A new report "Reducing Food Loss and Waste" has been released by 'World Resources Institute (WRI)' and 'Rockefeller Foundation'.
- It quantified that nearly one-third of the food produced each year goes uneaten, costing the global economy over \$940 billion.
- The uneaten food is responsible for emitting about 8% of planet-warming greenhouse gases into the atmosphere.
- It put forward a 'Global Action Agenda',
  - It calls on governments, companies, farmers and consumers to collectively overcome world's food loss problem.
  - Some of these actions include developing national strategies for food loss and waste reduction,
  - Creating national public-private partnerships,
  - Launch supply chain initiatives,
  - Reducing small-holder losses and
  - Shifting consumer social norms.
- According to the report most of the food loss happens,
  1. "Near the farm" predominantly in lower-income countries.
  2. "Near the plate" predominantly in higher-income countries.



- Using FAO data of the UN, the report concluded that,
  1. Roots and tubers are the food group that face the maximum wastage, at over 62%.
  2. Fruits and vegetables follow, with over 41%.
- Fruits and vegetables make up the largest share of total annual food loss and waste as a proportion, by weight, of all the food.

### Lightning Report

- The 'Mid-Monsoon 2019 Lightning Report' released by 'Climate Resilient Observing Systems Promotion Council' (CROPC).
- **CROPC**, a non-profit organisation works closely with India Meteorological Department (IMD).
- It also convened, 'Lightning Resilient Campaign'.
- The report is prepared using IMD's lightning forecasts including Nowcast, IITM-Pune's lightning network data, NRSC, ISRO inputs and ground-based impacts reports.
- For the first time, a report has mapped lightning strikes across the country, and the lives they have claimed.
- This is part of effort to prepare a lightning risk map of India and identify lightning hotspots.
- Lightning strikes have caused at least 1,311 deaths between April to July this year.

- UP accounted for 224 of these deaths, followed by Bihar (170), Odisha (129) and Jharkhand (118).

- It counted 65.55 lakh lightning strikes in India during April to July period, of which Odisha recorded over 9 lakh incidents.

- IMD-installed sensors across India, have been giving alerts.

- It is possible to predict, 30-40 minutes in advance, when a lightning strike heads towards Earth.

- Location-based SMS services is available, State governments should take the data and start an emergency response system.

- But this is not done in many states, resulting in high casualties.

- Timely dissemination of this information can save several lives.

- After receiving alerts from IMD, they send pre-fixed messages to the grassroots utilising their network.

- Vulnerable people have been trained how to respond after hearing the warning siren.

- Recent observations confirm that the Chhotanagpur plateau,

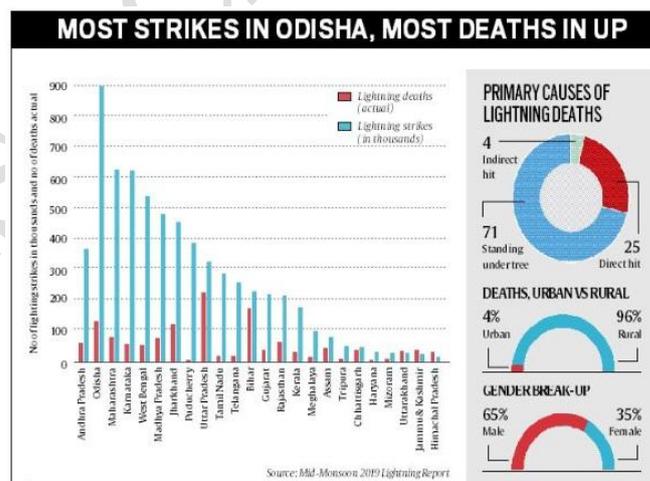
- which is the confluence of Jharkhand, Odisha, part of Chhattisgarh and West Bengal inhabited by tribals.
- It is the most lightning-prone area.

- The area is electrostatically and thermodynamically charged, resulting in lightning.

- The report also founds that areas prone to heatwaves were also prone to lightning.

- Pollution increases aerosols in the atmosphere, which in turn increases lightning.

- There have been at least 2 to 3 instances of lightning strikes without rainfall, killing persons in Jharkhand.



### The Lancet Child & Adolescent Health Report

- The report gives a comprehensive estimates of disease burden due to malnutrition and its trends in every state of India.

- According to the report, two-thirds of the 1.04 million deaths in children under 5 years in India are due to malnutrition.

- The overall under-five death rate due to malnutrition has decreased substantially from 1990 to 2017.
- However, malnutrition is still the underlying risk factor for 68% of the deaths in under-five children in India.

- The Disability-Adjusted Life Years (DALY) rate attributable to malnutrition in children varies 7-fold among the states.

- The deaths rate range as high as 72.7% in Bihar and a low of 50.8% in Kerala.

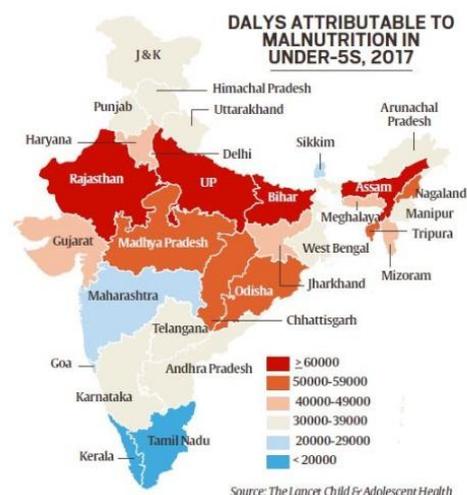
- Rajasthan, Chhattisgarh and Uttar Pradesh are states with a high such proportion.

- Meghalaya, Tamil Nadu, Mizoram and Goa have the lowest proportions of such deaths.

- Among the malnutrition indicators, 'low birth weight' is the largest contributor to child deaths in India.

- It is followed by child growth failure which includes stunting, underweight, and wasting.

- For substantial improvements across malnutrition indicators, states need to implement an integrated nutrition policy.



### International Migrant Stock 2019

- The International Migrant Stock 2019, a dataset released by the Population Division of the UN Department of Economic and Social Affairs (DESA).

- It provides the latest estimates of the number of international migrants by age, sex and origin for all countries of the world.

- According to the data, there are 51,54,737 international migrants represent just 0.4% of the total population of India in 2019.

- The number has been consistently going down in the last 3 decades

- From 75.9 lakh in 1990, to is 51.5 lakh in 2019.

- Of the international migrants in India in 2019, the country of origin for 31 lakh or just over 60% was Bangladesh.

- Another 21% were originally from Pakistan and 10% from Nepal.

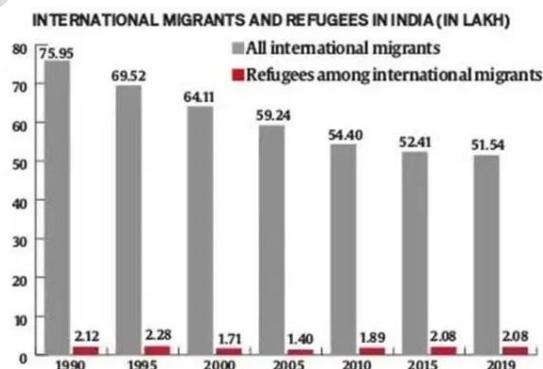
- The data encompass any person who moved across an international border, either intentionally or involuntarily.

- The international migrant population across all countries is 27.2 crore, who represent 3.5% of the total global population.

- Of these 27.2 crore, 1.75 crore are Indian migrants living in various countries.

- The proportion of women among international migrants in India is at 48.8%, which is higher than the 47.9% proportion of women among international migrants across countries.

- Increase in global number of international migrants continues to outpace growth of the world's population.



Source: International Migrant Stock 2019, UN

STATES WITH HIGHEST ENROLMENT				
State	Male students	Male %	Female students	Female %
Uttar Pradesh	31,89,520	49.30%	32,79,847	50.70%
Maharashtra	23,24,424	54.95%	19,05,902	45.05%
Tamil Nadu	17,36,870	50.87%	16,77,326	49.13%
West Bengal	10,56,511	50.37%	10,40,899	49.63%
Rajasthan	10,82,466	51.93%	10,01,947	48.07%
Karnataka	9,93,417	49.96%	9,95,077	50.04%

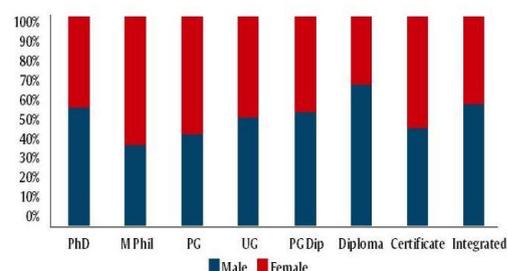
GENDER DISTRIBUTION BY CATEGORY			
Category	Students	Male	Female
Scheduled Castes	55,67,078	50.94%	49.06%
Scheduled Tribes	2,06,748	50.88%	29.12%
OBCs	1,35,91,994	50.83%	49.17%
Muslims	19,59,004	50.71%	49.29%
Other minorities	8,68,100	45.75%	54.25%
Persons with disability	85,877	56.14%	43.86%

Source: AISHE 2018-19

- In 2019, regionally,
  1. Europe hosts the largest number of international migrants (82 million), followed by
  2. Northern America (59 million) and
  3. Northern Africa and Western Asia (49 million).
- At the country level, about half of all international migrants reside in just 10 countries,
  1. The United States hosting the largest number of international migrants (51 million), equal to about 19% of the world's total.
- In terms of age, 1 out of every 7 international migrants is below the age of 20 years.
  1. 3 out of every 4 international migrants are of working age (20-64 years).

### **All India Survey on Higher Education (AISHE) 2018-19**

- AISHE was initiated in the year 2010-11 by the Ministry of Human Resource Development (MHRD).
- The main objectives of the survey was to,
  1. Identify and capture all the institutions of higher learning in the country.
  2. Collect the data from all the higher education institutions on various aspects of higher education.
- Data is being collected on several parameters such as,
  1. Teachers, student enrolment, programmes,
  2. Examination results, education finance, infrastructure.
  3. Indicators such as Gross Enrolment Ratio, Pupil-teacher ratio, Gender Parity Index.
  4. These are useful in making informed policy decisions and research for development of education sector.
- AISHE2018-19 showed the gender distribution of students enrolled in various higher education courses in the country.
- The total estimated student enrolment in the country is 3,73,99,388, out of which 51.36% are male and 48.64% female.
- The 'Gender ratio' is higher on the male side in most courses, but there are exceptions,
  1. Female enrolment is higher at M Phil and Postgraduate.
  2. Enrolment at UG level is 51% male and 49% female.
  3. Diploma has a highly skewed distribution at 66.8% male and 33.2% female.
  4. At PhD level, male enrolment is 56.18% and female enrolment is 43.82%.
  5. At integrated level, the distribution 57.50% male and 42.50% female.
  6. PG Diploma student enrolment is 54.09% male and 45.91% female.
- A higher overall share of male students in enrolment is a trend also in most of the states.
- The report is based on voluntary uploading of data by institutions of Higher Education listed in government portal.



### **United in Science Report**

- The report was compiled by **WMO** under the umbrella of the Science Advisory Group of the **UN Climate Summit**.
- It stated that global temperatures have increased by 1.1°C since 1850, and have spiked 0.2°C between 2011 and 2015.
- In 2018, the annual growth in **CO2** emissions soared 2% and reached a record high of 37 billion tonnes.



- The current levels of CO<sub>2</sub>, methane and Nitrous oxide represent 146%, 257 % and 122% respectively of preindustrial levels.
- Moreover, the average global temperatures from 2015-2019 are also on track to be the warmest five-year period on record.
- The increasing climate change has also accelerated sea-level rise, and made oceans more acidic than ever before.
- Global sea-levels increased to approximately 4 mm/yr during 2007-2016, from 3.04 mm/yr during 1997-2006.
- Rise in CO<sub>2</sub> levels, meanwhile, are responsible for the growing acidity in the oceans.
- Oceans are a major source of carbon sink. They store nearly 25 % of the annual human induced CO<sub>2</sub> emissions.
- The report also recorded a decline in Arctic sea ice by 12 % per decade from 1979-2018.
- Antarctic ice sheet lost at least six-fold amount of ice annually between 1979 and 2017.
- Report suggested that, to combat the impacts of climate change, there is a need to triple the 'Nationally determined contributions'(NDCs).
- It highlights the urgent need for development of concrete actions that halt global warming and the worst effects of climate change.

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