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**{Agri – Crops – 2021/01} Sugar Industry**

**TH | Prelims + Mains | GS3 > Issues Related to Farm Subsidies & MSP**

- **Context:** Sugar mills have claimed that the present dual sugarcane pricing of **Fair and Remunerative Price (FRP)** and **State Advised Price (SAP)** is leading to rising cane price payment arrears to farmers.
- Sugar mills are required to pay the FRP/SAP to sugarcane farmers **irrespective of market prices.**
- The FRP and SAP are prices set by the **state governments.**
- This is the minimum price that the millers need to pay to the farmers for the sugarcane.
- This was held valid in a Supreme Court judgment in 2009.
- Sugarcane prices are governed by the Sugarcane (control) order, 1966 issued under the **Essential Commodities Act (ECA), 1955.**

**{Agri – Fisheries – 2021/01} Blue Revolution**

**PIB | Prelims + Mains | GS3 > Government Policies & Interventions for Development in Various Sectors**

- **Context:** PM talked of the recently launched 20K crore **Matasya Samapada Yojna & Seaweed Farming.**
- India is the **second largest fish producer in the world** with a total production of 13.7 million metric tonnes in 2018-19 of which **65 per cent was from inland sector.**
- China is way ahead at a whopping 60 million tonnes per annum.

**Growth in fisheries**

- Fisheries sector registered more than double growth in past 5 years.
- The sector has grown rapidly from 4.9 per cent in 2012-13 to 11.9 per cent in 2017-18.
- On the other hand, growth in sectors like crop, livestock & forestry from 2014-15 to 2017-18 has been highly fluctuating.
- Fish & fish product exports emerged as the **largest group in agricultural exports & in value terms** accounted for Rs 47,620 crore in 2018-19.
- Fisheries provide employment to more than 14.5 million people.

**Steps taken to improve the fisheries sector**

- Foreseeing the vast resource potential & possibilities in the fisheries sector, **a separate Department of Fisheries was created in February 2019.**
- The Government has merged all the schemes of fisheries Sector into an umbrella scheme of **‘Blue Revolution: Integrated Development & Management of Fisheries’.**
- **Fisheries & Aquaculture Infrastructure Development Fund (FIDF) was approved with a total fund size of Rs 7522.48 crore.**

**Blue Revolution: Integrated Development & Management of Fisheries**

- **Department of Animal Husbandry, Dairying & Fisheries** has restructured the scheme by merging all the ongoing schemes under an **umbrella of Blue Revolution.**
- Under the **Centrally Sponsored Scheme (CSS) of Blue Revolution, financial assistance is provided to the States/UTs** to support the fishermen.
• The restructured scheme covers inland fisheries, aquaculture, marine fisheries including deep sea fishing, mariculture & all activities undertaken by the National Fisheries Development Board (NFDB).

• The scheme has a total Central outlay of 3000 crore for five years & has the following components:
  ✓ National Fisheries Development Board (NFDB) & its activities,
  ✓ Development of Inland Fisheries & Aquaculture,
  ✓ Development of Marine Fisheries, Infrastructure & Post-Harvest Operations,
  ✓ Strengthening of Database & Geographical Information System of the Fisheries Sector, and
  ✓ Monitoring, Control & Surveillance (MCS) & other need-based Interventions.

**Fisheries & Aquaculture Development Fund (FIDF)**

• The first tripartite MoU was signed between the department of Fisheries, GOI, NARBARD & the Government of Tamil Nadu for the implementation of Fisheries & Aquaculture Development Fund (FIDF).

• FIDF is created with a total of Rs. 7522.48 crore to address the infrastructure requirement for fisheries sector.

• FIDF provides concessional finance to the eligible entities, cooperatives, individuals & entrepreneurs for development of identified fisheries infrastructure.

• NARBARD, National Cooperatives Development Corporation (NCDC) & all scheduled banks are Nodal Loaning entities (NLEs) to provide concessional finance under the (FIDF).

• The Department of Fisheries, under the FIDF provides interest subvention up to 3% per annum for providing the concessional finance by the NLEs.

• The Government of Tamil Nadu has signed the first Tripartite MoA for availing the initial concessional finance of Rs 420 crore from NARBARD for development of three fishing harbours in the State.

• These will create safe landing & berthing facilities for many fishing vessels plying in the area, augment fish production in the regions, facilitate hygienic post–harvest handling of fish, etc.

• NABARD as one of the Nodal Loaning Entities (NLEs) provides concessional finance for development of fisheries infrastructure facilities through State Governments/State Entities under the FIDF.

**Pradhan Mantri Matsya Sampada Yojana (PMMSY)**

• The Government has launched the PMMSY for the development of marine & inland fisheries.

• Rs 11,000 crore for activities in Marine, Inland fisheries, & Aquaculture & Rs. 9000 crores for Infrastructure – Fishing Harbours, Cold chain, Markets etc shall be provided.

• There are provisions of Ban Period Support to fishermen (during the period fishing is not permitted).

• The focus will be on Islands, Himalayan States, North-east & Aspirational Districts.

**Kisan credit cards for Fishermen**

• Government has also extended the facilities of Kissan Credit Cards (KCC) to fishers & fish farmers to help them in meeting their working capital needs.

**Development of Inland Fisheries & Aquaculture**

• It is Centrally Sponsored Scheme.
• The components approved under the scheme are:
  1. Development of Freshwater Aquaculture.
  2. Development of Brackish water Aquaculture.
  4. Development of Waterlogged Areas.
  5. Productive Utilization of Inland Saline/Alkaline Soils for Aquaculture.
  6. Integrated Development of Inland Capture Resources (reservoirs/rivers etc.)
  7. creation of a buffer zone between the near shore & offshore regions (waters between 200 m & 500 m in depth) to regulate fishing.

National Fisheries Development Board (NFDB)

• NFDB works for development of Fisheries in the country from Intensive Aquaculture in Ponds & tanks to Coastal Aquaculture.
• It also focuses on: -
  1. Human Resources development programs in fisheries sectors,
  2. Deep sea fishing & tuna processing,
  3. Ornamental Fisheries,
  4. Innovative Projects Quality seed dissemination program,
  5. Cage & pen culture in open water bodies etc.

Draft National Inland Fisheries & Aquaculture Policy (NIFAP)

• For Inland Fisheries:
  1. Conserving indigenous resources,
  2. Restoring natural ecosystem of Rivers,
  3. Conserving & restoring ecosystem in natural wetlands & bringing policies,

• For Aquaculture:
  1. Developing State & Area-specific action plans,
  2. Redefining land use categories to include fisheries & aquaculture as components of agriculture,
  3. Developing separate programmes for small framers,
  4. Infuse public & private investments & take R&D benefits to the farmers & fishers.

For the safety of fisherman

• GOI has issued an advisory to all coastal States & UTs to make mandatory the use of Automatic Identification System (AIS) & Vessel Monitoring Systems (VMS) in fishing vessels for safe navigation.

GEMINI: Gagan Enabled Mariner’s Instrument for Navigation & Information

• For dissemination of information on disaster warnings, Potential Fishing Zones (PFZ) and Ocean States Forecasts (OSF) to fishermen, GOI launched GEMINI device and mobile application.

The need for GEMINI

• PFZ forecasts, developed by INCOIS, will provide advisories on PFZ to fishermen 3 days in advance.
• Ocean State Forecasts include the forecasts on winds, waves, ocean currents, water temperature, etc.
• However, PFZ & OSF advisories do not reach fishermen when they move 10-12 km away from the coast.
The communication gap puts the life & property of those involved in deep sea fishing in Indian Ocean at risk.

To overcome this difficulty, GEMINI portable device was developed.

**How GEMINI works?**

GEMINI device utilizes the **GAGAN** system to transmit the PFZ, OSF and disaster warnings to user's cell phone.

The GEMINI app on the cell phone decodes the signals from GEMINI device and alerts the user on imminent threats like cyclones, high waves, strong winds along with PFZ and search and rescue mission.

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**Transforming Fisheries Sector - Supporting Livelihoods**

*Creation of Department of Fisheries*

- To provide sustained and focused attention towards holistic development of fisheries and welfare of fishers and fish farmers
- To provide requisite impetus towards economic empowerment of fishers and fish farmers

**Major Schemes and Programmes**

- Centrally Sponsored Scheme “Blue Revolution” implemented with Central outlay of Rs. 3000 crore
- “Fisheries and Aquaculture Infrastructure Development Fund” (FIDF) to the tune of Rs. 7522 crore created in 2018-19
- Benefits of ‘Kisan Credit Cards’ (KCC) extended to fishers and fish farmers to meet their working capital needs
- Empowerment of traditional fishermen in Deep Sea Fishing by providing requisite skills and assistance for purchase of vessels
- National Policy on Marine Fisheries, 2017 announced

**Significant Growth in Fisheries**

- Fish production registered all time high at 126.14 lakh tonnes (2017-18) with an average annual growth of 7.14% for the last 4 years
- Export earning from fisheries sector registered at Rs. 45,106.89 crore during 2017-18 with an impressive average annual growth of 11.31% in last 4 years

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**Issues faced by Indian Fisheries**

- **India lies in Tropical belt.**
  - Tropical fisheries have higher oil content which is less desirable for eating.
  - In the Tropical regions, multiple varieties of fishes occur, but in smaller groups, which is not good for large scale commercial exploitation.
- Sector suffers from Lack of a reliable database relating to aquatic & fisheries resources.
- Frequent confrontation of Indian Fishermen with Sri Lankan Navy.
- Aquatic pollution, destruction of fish habitats & frequent occurrence of Dead Zones/Hypoxic
zones leading to shifting or permanent loss of Fishing zone.

- Lack of access to quality seed & feed, inadequate availability of credit.
- Increased use of Fibre Reinforced plastic (FRP), & poor-quality boats leading to ill effects on marine culture.
- Poor infrastructure such as cold storage facilities, leading to an estimated 15-20% post-harvest loss.
- Issue of Formalin leads to negative branding of Indian fisheries.

(Agri – Fisheries – 2021/01) Seaweeds

PIB | Prelims + Mains | GS3 > Government Policies & Interventions for Development in Various Sectors

- **Context:** PM talked of the recently launched 20K crore Matasya Samapada Yojna & Seaweed Farming.

About Seaweeds

- Seaweed is the common name for countless species of marine plants & algae that grow in the ocean as well as in rivers, lakes, & other water bodies.
- They are macrophytic which mean they live in water or moist land surfaces.
- They generally grow in the shallow waters in the tidal zone.
- Some seaweeds are microscopic, such as the phytoplankton that live suspended in the water column.
- Some are enormous, like the giant kelp that grow in abundant “forests” from their roots at the bottom.
- Seaweeds exhibit highest photosynthesis efficiency due to moist conditions.
- They contribute to about 50% of all photosynthesis in the world.

Commercial Significance

- Seaweed is full of vitamins, minerals, & fibre.
- Many seaweeds contain anti-inflammatory & anti-microbial agents.
- They are known to process significant medicinal effects.
- Certain seaweeds possess powerful cancer-fighting agents.
- They are effective binding agents (emulsifiers) & are used commercial goods as toothpaste & fruit jelly, & popular softeners (emollients) in organic cosmetics & skin-care products.

Why Seaweed Farming?

- Provide occupation for the coastal people.
- Provide continues supply of raw material for seaweed-based industry.
- Seaweed farming is eco-friendly.
- It is a major tool to treat coastal pollution in the sea & reduce CO2 in global warming.

Seaweed Cultivation: Potential in India

- India is among the 12 mega-biodiversity nations in the world.
- India has an Exclusive Economic Zone (EEZ) of 2.17 million km².
- The Indian coastline, with its different coastal ecosystems, supports luxuriant growth of diverse seaweed populations, having considerable economic importance.
- About 844 seaweed species are reported from India which has a coastline of 7,500 km.
- On the West Coast, especially in Gujarat, abundant resources are present on the intertidal & subtidal regions.
- These resources have great potential for the development of seaweed-based industries in India.
• Tamil Nadu, Gujarat coasts, Lakshadweep & Andaman & Nicobar Islands are abundant in seaweed.
• Rich seaweed beds are also found around Mumbai, Ratnagiri, Goa, Karwar, Varkala, Vizhinjam & Pulicat in Tamil Nadu & Chilka in Orissa.
• Gulf of Mannar is home to more than 240 seaweed varieties out of which at least 185 are edible ones.

Challenges to seaweed harvesting in India

• Labour shortages during the paddy harvesting & transplanting season.
• Lack of livelihood security due to low wages & during bad weather.
• Lack of technology to improve processed products.
• Lack of information on new & alternative sources of raw material.
• Risky as they must be collected from depths of more than 25 to 30 feet to collect seaweed.
• Over-exploitation: While India has rich source of seaweed varieties, we have **focused only on harvesting not cultivation** thus leading to over-exploitation.

• Lack of awareness about health benefits act as hindrance to nutrition transition among population.
• Less market demand.
• Lack of support from government.

**Agri – Food Security – 2021/01** One Nation One Ration Card (ONORC Scheme)

Livemint | Prelims +Mains | GS3 > Public Distribution System & issues of buffer stocks and food security.

• **Context:** MPs raised concerns over gaps in implementation of ONORC scheme.
• The ONORC scheme seeks to ensure that beneficiaries under NFSA get ration from **any fair price shop across the country** that has a biometric verification system in place.
• The reforms stipulate Aadhaar seeding of ration cards, biometric authentication of beneficiaries, and automation of all fair price shops across the country.
• Currently, about **23 crore ration cards** have been issued to nearly **80 crore beneficiaries** of NFSA.
• In the present system, a ration cardholder can buy food grains **only from an FPS that has been assigned to her in the locality in which she lives**.
• However, this will change once the ‘One Nation, One Ration Card’ system becomes operational nationally.

**National Food Security Act (NFSA), 2013**

• The NSFA, 2013 was notified with the objective to provide for food & **nutritional security**.
• The Act provides for coverage of upto **75% of the rural population** & upto **50% of the urban population** for receiving subsidized food-
grains under Targeted Public Distribution System (TPDS).

- The eligible persons will be entitled to receive 5 Kgs of foodgrains per person per month at subsidised prices of Rs. 3/2/1 per Kg for rice/wheat/coarse grains.

- The existing Antyodaya Anna Yojana (AAY) households, which constitute the poorest of the poor, will continue to receive 35 Kgs of foodgrains per household per month.

- The Act also has a special focus on the nutritional support to women & children.

- Besides meal to pregnant women & lactating mothers during pregnancy & six months after the childbirth, such women will also be entitled to receive maternity benefit of not less than Rs. 6,000.

- Children upto 14 years of age will be entitled to nutritious meals.

- In case of non-supply of entitled foodgrains or meals, the beneficiaries will receive food security allowance.

**Women’s role and participation in farm activities**

- Women have always been the backbone of a large majority of farming activity and yet they have not had the recognition they deserve due to gender inequality.

- In the Indian scenario, according to NSSO 68th round data, women constitute 63% of the workforce in agriculture while their share of operational landholding is a mere 12.8%.

- Traditionally, women have been involved in labour-intensive work like weeding, hand harvesting, pre-pack handling of various vegetables and rice production.

- However, the women farmers are deprived of farm basics like access to various resources like land, water, credit, technology, and training.

**Major causes of the gender gap in the Indian agro-economy**

**Gender Discrimination in Land ownership**

- Women are restricted in terms of access to land which comprises a major role in wealth creation and economic empowerment.

**The longstanding patriarchal disconnect**

- Lack of tenure security and accessibility to entitlements stand as a barrier in empowering female farmers.

- For example, under the aegis of Panchayati Raj Act (1993), in the proxy sarpanches or sarpanchpatis, the control is often vested with the husband of the elected woman representative.
• Such inclusions in State policy constrain women's choices and prevent women from exercising their legal rights like exogamy (marrying outside one's social group), property rights, etc.
• Patriarchy also leads to low level of female literacy, male dominance in public & economic affairs, judicial and administrative actions at various levels.

Women and unpaid domestic responsibilities
• In most societies, gender roles are well defined.
• Chores like child-rearing, household tasks as well as rearing small livestock are undertaken by women and it does not add to any monetary benefit for themselves.
• This work burden limits the capacity of women to engage in income-generating activities.

Way forward
• It is crucial to adopt gender-specific interventions to enhance women's role in agro-economy.
• Reforms need to be undertaken to ensure women farmers security, mobility, and access to local trade.
• An increased role and representation of women in local market committees will help reduce the gender-gap.

Issues with the PM-Kisan Scheme

The scheme comes with a retrospective clause
• If a farmer registered during the first period, she/he will get all three instalments.
• If registration was during the second period, the farmer will receive two instalments — second and third.
• Farmers registered during the third period would get only the third instalment.

The landless and the tenant farmers are not eligible
• The landless and the tenant farmers are not eligible for the scheme while the absentee landlords can receive the benefits.
• Adivasi that cultivates land without individual rights are also left out of the scheme.

\{Agri – Subsidies – 2021/01\} Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)
• It does not take into consideration the small & marginal farmers that are employed in the allied sectors.

Subsidy burden

• Subsidy burden has increased substantially after the scheme is extended to farmer families irrespective of the size of land holding.

Ownership verification is tedious and eligible beneficiaries are kept out

• GOI identified only 8.4 crore beneficiaries in 2019 while the estimated number is more than 14 crores.
• Multiple departments hold the documents required to establish land ownership:
  ✓ Registration Department keeps the sale deeds,
  ✓ Survey Department keeps the maps,
  ✓ Revenue Department keeps property tax receipts.
• Thus, verifying ownership claims is a daunting task.

Payments to ineligible beneficiaries and income taxpayer farmers

• 2020: Payments worth ₹1,364 crore have been made to more than 20 lakh ineligible beneficiaries and income taxpayer farmers.
• Punjab (23%), Maharashtra (17%) and Assam (14%) account for more than half of the beneficiaries of wrong payments, followed by Gujarat and Uttar Pradesh with 8% each.

Environment Current Affairs by Pmfias.com – January 2021

{Envi – CC – 2021/01} Global Warming & Arctic region

IE | Prelims + Mains | GS3 > Environmental Pollution & Degradation | GS3 > Climate Change

Present situation of Arctic

• The region is warming up twice as fast as the global average.
• Since 1980, the volume of Arctic sea ice has declined by as much as 75 per cent.
• The Northern Sea Route (NSR) which would connect the North Atlantic to the North Pacific through a short polar arc is slowly opening due to the melting of ice.
• A trickle of commercial cargo vessels has been going through NSR every summer since the last decade.

Concerns

• The loss of ice & the warming waters will affect sea levels, salinity levels, & current precipitation patterns.
• The Tundra is returning to swamp (→ loss of forest → loss of carbon sink), the permafrost is thawing (→ exposing the subsurface carbon sinks), & wildfires are devastating interior Canada & Russia.
• The phenomenally rich biodiversity of the Arctic region is under serious threat.

New Opportunities

• The opening of the Arctic presents huge commercial & economic opportunities, particularly in shipping, energy, fisheries, & mineral resources.
• Commercial navigation through the NSR is the most tempting: The distance from Rotterdam to Yokohama will be cut by 40 per cent compared to the Suez route.
• Access to unexploited resources
  ✓ Unexplored oil & natural gas deposits are estimated to be 22% of the world’s unexplored resources, mostly in the Arctic ocean
  ✓ mineral deposits including 25 per cent of the global reserves of rare earths are buried in Greenland.

Challenges associated with new opportunities

• Navigation conditions are dangerous & restricted to the summer.
• Lack of deep-water ports, a need for icebreakers, shortage of workers trained for polar conditions, & high insurance costs add to the difficulties.
• Mining & deep-sea drilling carry massive costs & environmental risks.
• The complication is that, unlike Antarctica, the Arctic is not a global common.
• There is no treaty that governs it, only the UN Convention of Law of the Sea (UNCLOS) deals it.
• Large parts of it are under the sovereignty of the five littoral states — Russia, Canada, Norway, Denmark (Greenland) & the US & exploitation of the new resources is well within their rights.

• They have put in overlapping claims for extended continental shelves, & the right to seabed resources.
• In 2007, Russia embedded a flag on the seabed below the North Pole to bolster its claim.
• The US, not a party to UNCLOS, is under pressure to strengthen its Arctic presence.
• Russia claiming that the NSR falls within its territorial waters (the US believes it lies in international waters).
• China has been projecting the Polar Silk Road as an extension of the BRI for economic advantage.

Impact on India

• India’s extensive coastline makes us vulnerable to the impact of Arctic warming on ocean currents.
• Research in Arctic melting will help us understand of climatic changes in the Third Pole — the Himalayas.
• The strategic implications of an active China in the Arctic & its growing economic & strategic relationship with Russia are self-evident.
• India has observer status in the Arctic Council, which is the predominant intergovernmental forum for cooperation on the environmental & development (though not the security) aspects of the Arctic.
Previous UPSC Mains Questions

1. Why is India taking keen interest in resources of Arctic Region? (2018)
3. What is the economic significance of discovery of oil in the Arctic Sea & its possible environmental consequences? (2015)

Integrated Development of Wildlife Habitats

TOI | Prelims + Mains | GS3 > Conservation

- **Context:** Conservation of Caracal cat (put under Indian critically endangered list) will get financial Integrated Development of Wildlife Habitat (IDWH).
- **IDWH:** is an on-going Centrally Sponsored Scheme.
- **Under IDWH:** financial assistance is provided to State/UTs for protection and conservation of wildlife.

Components of the scheme

1. **Support to Protected Areas** (National Parks, Wildlife Sanctuaries, Conservation & Community Reserves)
2. **Protection of Wildlife Outside Protected Areas**
3. **Recovery programmes** for saving critically endangered species and habitats.

The list of critically endangered (locally) species under recovery programme

1. Asian Wild Buffalo
2. Asiatic Lion
3. Brow-Antlered Deer or Sangai
4. Dugong
5. Edible Nest Swiftlet
6. Gangetic River Dolphin
7. Great Indian Bustard
8. Hangul
9. Indian Rhino or Great One-horned Rhinoceros
10. Jerdon’s Courser
11. Malabar Civet
12. Marine Turtles*
13. Nicobar Megapode
14. Nilgiri Tahr
15. Snow Leopard
16. Swamp Deer
17. Vultures (entire group of species found in India)
18. Northern River Terrapin
19. Clouded Leopard
20. Arabian Sea Humpback Whale
21. Red Panda
22. Caracal cat (questions can be asked in multiple ways based on this topic in prelims)

Nilgiri Elephant Corridor Case

TH | Prelims + Mains | GS3 > Conservation

- **Context:** SC upheld the Tamil Nadu (state) government’s authority to notify an ‘elephant corridor’ and protect the migratory path of the animals through the Nilgiri Biosphere Reserve.
- **It was the State’s duty to protect a “keystone species”** such as elephants – Supreme Court.

Elephant Corridor

- Elephant corridors are linear, narrow, natural habitat linkages that allow elephants to move between secure habitats without being disturbed by humans.
**Keystone Species**

It is a species whose **addition to or loss from** an ecosystem leads to **major changes** in the occurrence of at least one other species.

If keystone species is **lost**, it will result in the **degradation of the whole ecosystem**.

Considered more important in **determining the presence of many other species** in that ecosystem.

Eg: **Top Level Predators**

**Indicator Species**

It is the one who's **presence or absence or abundance** reflects the environmental condition.

They serve as **early warning mechanism or signals** because they are sensitive to environmental conditions.

Also Known as **Sentinel Species**.

Eg: **Frogs, Lichens, Salmon**

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**Endemic Species**

They are **native to a single specific geographical location** such as an island, state, nation, country or other defined zone.

A rare alternative term for a species that is endemic is **'precinctive'** (species that are restricted to a defined geographical area).

Eg: **Western Ghats—> Lion-tailed macaque**
Eg: **Western Ghats—> Nilgiri Tahr**
Eg: **Himalayas—> Red Panda etc.**
Eg: **Eastern Ghats—> Flying Squirrel**
Eg: **Eastern Ghats—> Civet**

**Invasive Alien Species**

An Exotic Species which is **introduced in an area (Intentionally or Unintentionally)**.

Once introduced they **multiply so rapidly** that they destroy the local habitat of an area.

Eg: **Lantana, Fall Army Worm, Eucalyptus, Wattle, Prosopis Juliflora, Common Water Hyacinth**
There are 88 identified elephant corridors in India (names not important).
Out of total 88 corridors,
- 22 in north-eastern India (prelims point)
- 20 are in south India,
- 20 in central India,
- 14 in northern West Bengal
- 12 in north-western India.

**Nilgiri Elephant Corridor**
- It is the largest protected forest area in India, spanning across Tamil Nadu, Karnataka & Kerala.
- It is situated in the Masinagudi area near the Mudumalai National Park in the Nilgiris district.
- The corridor is situated in the ecologically fragile Sigur plateau, which connects the Western & the Eastern Ghats & sustains elephant populations & their genetic diversity.
- It has the Nilgiri hills on its southwestern side & the Moyar river valley on its northeastern side. The elephants cross the plateau in search of food & water depending on the monsoon.
**TH | Prelims | GS3 > Conservation | Basics: Indian Vulture Crisis**

- **Context:** To increase the availability of food for vultures in the Mudumalai Tiger Reserve (MTR), the Forest Department is allowing dead cattle from a nearby cow shelter to be left for the scavengers.
- In a bid to save endangered species of vultures from extinction, the National Board for Wildlife has approved a new plan that proposes setting up Vulture Conservation Breeding Centres in some States.
- A captive breeding centre would come up in the buffer zone of Mudumalai Tiger Reserve.
- **Critically endangered Oriental White-backed Vultures, Indian white-rumped vulture & long-billed vulture** are found here.

**{Envi – IUCN – 2021/01} Caracal Cat**

**TOI | Prelims | GS3 > Conservation**

- **Context:** Caracal put on critically endangered list under Indian List of critically endangered species.

- It is medium sized wild cat.
- Found in parts of Rajasthan & Gujarat in India.
- **IUCN Red List:** Least concerned since they are found in abundance in Africa.

**{Envi – Laws – 2021/01} Wildlife Advisory Boards**

**PIB | Prelims | GS3 > Conservation**

- **Context:** The Standing Committee of National Board of Wildlife (SC-NBWL) has approved the advisory for management of Human-Wildlife Conflict (HWC) in the country.
- The Committee also approved the inclusion of Caracal, a wild cat found in some parts of Rajasthan and Gujarat, in the list of critically endangered species (Indian CR List; not IUCN List).
- The Standing Committee of NBWL considers proposals after a series of levels of scrutiny and have recommendations of the State Chief Wildlife Warden, State Government and the State Board for Wildlife.
- **The advisory envisages:**
  - Empowering gram panchayats in dealing with the problematic wild animals as per Wild Life (Protection) Act, 1972.
  - Utilising add-on coverage under the Pradhan Mantri Fasal Bima Yojna for crop compensation against crop damage due to HWC.
  - Augmenting fodder and water sources within the forest areas.
  - Payment of a portion of ex-gratia as interim relief within 24 hours of the incident to the victim/family.

**National Board for Wildlife (NBWL)**

- NBWL is a statutory body constituted under Wildlife (protection) Act 1972.
History of National Board for Wildlife

- Due to the rapid decline in wildlife population, the GOI had constituted an advisory body designated as the Indian Board for Wildlife (IBWL) in 1952.
- The *Wildlife (Protection) Act 1972* was enacted for providing special legal protection to wildlife.
- It laid special emphasis on endangered species of fauna.
- As per the *Wildlife (Protection) Amendment Act, 2002*, a provision was incorporated for the constitution of the National Board for Wildlife, replacing the Indian Board for Wildlife.

Members of National Board for Wildlife

- The National Board for Wildlife has 47 members with the **Prime Minister in the Chair**.
- The **Minister in charge of the MoEF** in GOI is the Vice-Chairperson.
- The Additional Director General of Forests (WL) & Director, Wildlife Preservation is the Member-Secretary.

Other members include:

- three Members of Parliament (two from Lok Sabha and one from Rajya Sabha),
- five NGOs and
- 10 eminent ecologists, conservationists and environmentalists.

Duties

- The board is **advisory in nature** and advises the GOI in conservation of wildlife and forests.
- It has the power to review all wildlife-related matters and approve projects in and around national parks and sanctuaries.
- No alternation of boundaries in **national parks and wildlife sanctuaries** can be done without the approval of the National Board for Wildlife.

Wildlife Advisory Board (State Board for Wildlife)

- Wildlife Advisory Board is a **statutory body** of the state (UT) government.
- The *Wildlife (Protection) Act, 1972* mandates the **State (UT) Government** to constitute a Wildlife Advisory Board.
- **Minister in charge of Forest** in the **State (UT) is the Chairman** (Chief Secretary will be the chairman if the minister’s post is vacant).

Duties

- Advise the State Government in
  - selection and administration of areas to be declared as Sanctuaries, National Parks, Closed Areas;
  - formulation of the policy of protection and conservation of Wildlife and specified plants;
  - measures to be taken for harmonizing the needs of the tribals and other forest dwellers with the protection and conservation of wildlife; and
  - any matter that may be referred to it by the State Government.

(Envi – Pollution – 201/01) Green Tax

**TH** | **Prelims + Mains** | GS3 >Environmental Pollution and Degradation

- **Context:** Recently, Government proposes ‘green tax’ for 15-year-old petrol, diesel vehicles.
- Based on the principle of “**polluters must pay**”, this charge would be levied when commercial vehicles go for obtaining fresh fitness
certificate and private vehicles for seeking renewal of registration.

- **State governments** would be allowed to levy this tax over and above the regular road taxes.
- Currently, similar taxes are levied in Andhra Pradesh, Maharashtra Karnataka, Telangana, UP & Jharkhand.
- Transport vehicles such as city buses would attract less green tax.
- **Vehicles used for farming** such as tractors and combined harvesters could be exempted.
- **Vehicles running on clean fuel** such as CNG, LPG, ethanol & strong hybrid would also be exempted.

**{Envi – Pollution – 2021/01} Endosulfan**

**TH | Prelims + Mains | GS3 > Environmental Pollution & Degradation > Persistent Organic Pollutants**

- **Context:** Spraying of Endosulfan on cashew plantations in Kasaragod, Kerala has caused disorders in many.

**What is Endosulfan?**

- Endosulfan is an **organochlorine** insecticide — a **Persistent Organic Pollutant**.
- It is primarily used as an **insecticide** in agriculture & it is also used as a **wood preservative**.

**Ban on Endosulfan**

- India was one of the biggest producers & consumers of endosulfan.
- After the toxicity of the pesticide came into limelight in 2001 in Kasargod District, Kerala banned it.
- **In 2011, SC banned the production, distribution & use of endosulfan in India.**
- SC also directed Kerala government to pay Rs 500 crores as compensation to over 5,000 victims.
- **Globally, use of endosulfan is banned under Stockholm Convention on Persistent Organic Pollutants.**
- Under pressure from pesticide firms India sought remission on the ban for 10 years.
- India has agreed to **phase out use of endosulfan by 2017.**

**Hazardous Effects of Endosulfan**

- It is **highly toxic & has a large potential for bioaccumulation** (substance does not leave body).
- It has hazardous effects on **human genetic & endocrine systems.**
- **Endocrine disruptor:** enhances the effect of estrogens causing reproductive & developmental damage in both animals & humans.
  ✓ Delayed reproductive development
  ✓ Late sexual maturity
  ✓ Autism
- **Neurotoxic:** endosulfan destroys the integrity of the nerve cells.

**About Persistent Organic Pollutants (POPs)**

- POPs are defined as “chemical substances that persist in the environment, bioaccumulate through the food web, & pose a risk of causing adverse effects to human health & the environment”.
- Persistent organic pollutants (POPs) are chemicals of global concern due to their potential for:
  ✓ **long-range transport,**
  ✓ **persistence in the environment,**
  ✓ **ability to bio-magnify & bio-accumulate** in ecosystems,
  ✓ **Have significant negative effects on human health & the environment.**
The most commonly encountered POPs are organochlorine pesticides, such as
- Dichlorodiphenyltrichloroethane (DDT),
- Endosulfan,
- Polychlorinated biphenyls (PCB: resistant to extreme temperature & pressure).
- PCBs were used widely in electrical equipment like capacitors & transformers),
- Dioxins (toxic by-products produced when organic matter is burned), etc.

DDT was widely used a few decades ago as an effective pesticide & insecticide.
- It was later identified as POP, & its usage was phased out in almost all developed countries.
- DDT is banned for agricultural use in India; however, it continues to be used for fumigation against mosquitoes (disease vector control) in several places in India In India.

Stockholm Convention on Persistent Organic Pollutants
Persistent organic pollutants (POPs) are chemicals of global concern

1) Long-Range Transport

2) Persistence in the Environment

3) Bio-magnify & Bio-accumulate

Bioaccumulation

4) Have significant negative effects on human health & the environment.

Cancer  Immunity Suppression  Heart Disease

The environmental treaty that aims to eliminate POPs.

STOCKHOLM CONVENTION

POP EXAMPLES

Dichlorodiphenyltrichloroethane (DDT): insecticide
- DDT is banned for agricultural use in India
- It continues to be used for fumigation against mosquitoes

Endosulfan: insecticide

Polychlorinated biphenyls: resistant to extreme temperature; used widely in electrical equipment

Dioxins: toxic by-products produced when organic matter is burned

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CHLORINATED HYDROCARBONS (ORGANOCHLORIDES)

What are Organochlorides)

CHCs are hydrocarbons in which one or more hydrogen atoms have been replaced by chlorine.

E.g., DDT (dichlorodiphenyltrichloroethane), endosulfan, chloroform, carbon tetrachloride, etc.

Applications of Organochlorides)

Used in the production of polyvinyl chloride (a synthetic plastic polymer used to make PVC pipes).

Some are useful solvents in cleaning applications such as degreasing and dry cleaning.

DDT, heptachlor and endosulfan were widely used as pesticides.

• It is an international environmental treaty.
• It came into effective in 2004.
• It aims to eliminate or restrict the production & use of persistent organic pollutants (POPs).

Chlorinated Hydrocarbons (Organochlorides)

• CHCs are hydrocarbons in which one or more hydrogen atoms have been replaced by chlorine E.g., DDT (dichlorodiphenyltrichloroethane), endosulfan, chloroform, carbon tetrachloride, etc.

Applications of Chlorinated Hydrocarbons (CHC)

• CHCs are used in the production of polyvinyl chloride (a synthetic plastic polymer used to make PVC pipes).
• Chloroform, dichloromethane, dichloroethane, & trichloroethane are useful solvents.
• These solvents are immiscible with water (not forming a homogeneous mixture when mixed with water) & effective in cleaning applications such as degreasing & dry cleaning.
• DDT, heptachlor & endosulfan are widely used as pesticides.

Effects of Chlorinated Hydrocarbons (CHC)

• DDT accumulated in food chains & caused egg-shell thinning in certain bird species.
• In India, traces of DDT spray used three decades ago can still be found on the walls of homes.
• DDT residues continue to be found in mammals across the planet.
• In Arctic areas, particularly high levels are found in marine mammals.
• The traces of persistent organic pollutants are found in breast milk of several mammals.
• In females the concentration is lower due to transfer of the compounds to their offspring through lactation.

**Pesticide Regulatory Regime in India**

• India currently has a registered list of 295 pesticides & 746 approved formulations.
• These pesticides are registered by the **Registration Committee (RC).**
• The **Central Insecticides Board (CIB)** acts as an advisory body.
• The two regulatory bodies are governed by the **Insecticides Act, 1968** & the **Insecticides Rules, 1971**.
• The Act & Rules intend to “regulate the import, manufacture, sale, transport, distribution & use of insecticides with a view to prevent risk to human beings or animals”.
• Since its inception, the CIBRC (as they are together called) registers pesticides upon receiving applications along with efficacy, toxicity, & safety data from the company.
• The **Ministry of Agriculture** has the authority to cancel registrations & allow continued use or in some cases even ban the pesticides upon the recommendation of the RC.

**There is a near total collapse of pesticide regulation mechanism in India**

**2020 Notification on Draft ban order**

• In May 2020, a notification consisting of a draft ban order was released by the **Ministry of Agriculture & Farmers’ Welfare**, proposing a ban on the manufacture, sales, & imports of 27 pesticides in India.
• Several are **WHO Class I pesticides** (‘extremely hazardous’ & ‘highly hazardous’), some are classified as probable **human carcinogens**, some documented for their toxicity on bees, fish, earthworms, etc.
• Several are implicated in fatal pesticide poisonings whether it is occupational, or accidental.
• 24 of the 27 pesticides are banned in other countries.
• Many of these have been part of 2015 **Anupam Verma Committee** reviewed 66 “bannable” pesticides.
• At the behest of the industry, the **Department of Chemicals & Petrochemicals** cited Covid-19 pandemic situation as an excuse in proceeding with the draft ban order.

**Notable pesticides in the list of 27 proposed-to-be-banned pesticides**

- **Carcinogenic:** Oxyflourfen, Pendimethalin (causes Thyroid follicular cell adenoma)
- **Endocrine disruption:** Dicofol, Carbofuran, Oxyflourfen
- **Eco-toxic:** Carbofuran, Monocrotophos, Carbofuran, Oxyflourfen

**Deemed to be Registered Pesticides or DRPs**

- **DRPs** are pesticides that **were in use before the Insecticides Act of 1968** & could be used on the assumption that they would be registration once the mandatory data on efficacy & toxicity is generated.
- There are at least 51 such DRPs.
- Six of these have been withdrawn, eight have been banned & five are to be phased out by the end of 2020.
- The list of DRPs is not readily available on any government website (lack of transparency).
- Importantly, **17 of the 27 proposed-to-be-banned pesticides are DRPs.**
- These biosafety (safety to human health & environment) of these DRPs was never assessed.
• Bio-safety data submitted & review committee reports are shrouded in secrecy.
• They have been turned down even under RTI.
• They all are being considered registered, irrespective of the data submitted.
• No other nation is known to be following such an arbitrary, risky, & unscientific regulatory practice.
• Many of the DRPs have been banned in various countries, even decades ago.

{Envi – Pollution – 2021/01} Nitrous oxide emissions due to farming

TH | Prelims + Mains | GS3 > E-technology in the aid of farmers.

• **Context**: Indian biotechnologists have found a way to reduce the wastage of nitrogenous (N) fertilisers.
• **Agriculture accounts for over 70% of all nitrous oxide emissions** in the Indian environment, of which 77% is contributed by fertilisers, mostly urea.
• Nitrogen deficiency often leads to the plants having spindly stems and stunted growth.

{Envi – Pollution – 2021/01} Polluters Pay Principle

IE | Prelims + Mains | GS3 > Environmental Pollution & Degradation

**Present situation of Air pollution**

• The global death rate attributable to air pollution is **86 deaths per 100,000 people**.
• **92%** of the population lives in places where air pollution levels are above the WHO guideline for healthy air.
• Of all the deaths caused by ischemic heart disease (the biggest killer), **20%** are caused by air pollution.

• Of all the deaths caused by lung cancer (deadliest of all cancers), **19 per cent** are due to air pollution.

**What is the Polluter Pays Principle?**

• The ‘polluter pays’ principle is the commonly accepted practice that **those who produce pollution should bear the costs** of managing it to prevent damage to human health or the environment.
• For instance, a factory that produces a potentially poisonous substance as a by-product of its activities is usually held responsible for its safe disposal.
• The polluter pays principle is part of a set of broader principles to guide sustainable development worldwide (formally known as the **1992 Rio Declaration**).
• When the pollution cost from the release of GHGs is not imposed on emitters, these costs are thus ‘externalised’ to society, representing ‘market failure’.
• Society bears these costs as GHGs are emitted into the atmosphere, which is described a ‘global commons’ as everyone shares & has the right to use.

{Envi Mapping – TR – 2021/01} Bandipur Tiger Reserve

TH | Prelims | GS3 > Conservation

• **Context**: A stranded wild elephant was rescued close to Bandipur Tiger Reserve in Karnataka.
• Together with the adjoining Nagarhole NP, Mudumalai NP (TN) and Wayanad WLS (Kerala), it is part of the **Nilgiri Biosphere Reserve**.
• The Kabini river (a tributary of Cauvery River) separates Bandipur NP from Nagarhole NP.
• Bandipur NP is contiguous with the Mudumalai NP (Tamil Nadu) and Wayanad WLS (Kerala).
• Vegetation: dry deciduous forest, moist deciduous forests and shrublands.
• Major Flora: teak, rosewood, sandalwood (Veerappan’s favourite), clumping bamboo, etc.
• Major Fauna: Indian elephants, gaur, tigers, sloth bears, four-horned antelopes, dholes, chital, sambar, gray langurs, Indian giant squirrels.
• Threats: speeding vehicles, cattle grazing, transmission of disease, habitat fragmentation, & invasive species such as Lantana (thorny bush not eaten by animals) & Parthenium.
• There is a ban on traffic from 9 pm to 6 am of dusk to dawn to help bring down the death rate of wildlife.
{Envi Mapping – TR – 2021/01} Mudumalai Tiger Reserve

**TH | Prelims | Mapping > Tiger Reserves**

- It lies on the north-western side of the **Nilgiri Hills (Blue Mountains)**, in Nilgiri District.
- It shares its boundaries with the states of **Karnataka & Kerala**.
- Vegetation: tropical moist deciduous, tropical dry deciduous forest, tropical dry thorn forests are in the east.

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**Geography GS Current Affairs by Pmfias.com – January 2021**

{Geo – EG – Textiles – 2021/01} Eri Silk

**HT | Prelims | GS3 > Economics of Animal Rearing | Geography > Economic Geography > Silk Industry**

- **Context**: The Assam government has decided to provide garments made of ‘Eri’ to grade IV employees.
- ‘Eri’ is a variety of silk produced in the **NE states** of Assam, Bihar, Manipur, Nagaland, Meghalaya & WB.
- It is product of domesticated silkworm, philosamia ricini that **feeds mainly on castor leaves**.
- **Unlike Other kind of silk, this cannot be reeled & it is only spun**.
- **India is the only country producing all five kinds of silk** namely, Mulberry, Eri, Muga, Tropical Tasar & Temperate Tasar. *(Silk Industry is explained in Geography > Economic Geography > Silk Industry)*

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{Geo – Geomorphology – 2021/01} Earthquakes in Delhi NCR Region

**HT | Prelims + Mains | GS1 > Important Geophysical phenomena such as earthquakes, Tsunami, etc.**

- **Major Fauna**: *Indian elephant*, *Bengal tiger*, *gaur*, golden jackal, bonnet macaque, sambar deer, Indian muntjac, *Indian giant squirrel*, red giant flying squirrel, etc.
- **Major Avian Fauna**: *Indian white-rumped vulture* *(CR)* & *Indian Vulture* *(CR)*.
- **Threats**: Tourism & invasive species such as lantana.

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**Basics: ‘Fault’ in Geology | Earthquakes | Richter Magnitude Scale**

- **Context**: The National Capital Region (NCR) has witnessed more than 20 earthquakes since April.
- Experts say that these low intensity earthquakes are a sign that a major earthquake is due for the Delhi-NCR.
- While others believe that these earthquakes are reducing the chances of a major earthquake in the region.

**Why so many earthquakes in Delhi NCR Region?**

- New Delhi experienced its seventh earthquake in just two months.
- They were all minor, with magnitudes of less than 5.
- Studies have indicated that the *Indian plate is still moving into the Asian plate at 5-6 cm per year*.
- The consequences of this motion can be observed in the form of *ongoing mountain formation*. 
The crust has deformed under the Himalaya in such a way that there is tremendous amount of strain.

Strain will be able to release if rocks can find some room to shift, move around or even break apart.

This slow release of tension is what Delhi’s seismic zone is experiencing in the form of minor earthquakes.

If the crust in this part can slowly release all its tension, there would not have to be a megaquake in the future since there is no accumulation of energy/strain.

Also, Delhi is closer to multiple faults (Faults are the regions of seismic activities) such as:
1. Mahendragarh-Dehradun Fault (MDF),
2. Sohna Fault (SF) &
3. Mathura Fault (MF)

Delhi standing on danger line due to hazardous development

- Delhi has developed in a very clumsy way.
- The construction of colonies here is quite dense.
- Also, there is a lot of illegal construction in Delhi.
- Two-thirds of the capital’s population live in illegally constructed houses.
- Areas on the banks of the Yamuna in Delhi come under the maximum danger.

Preparation?

- National Seismological Network (NSN) is being operated & maintained by National Seismological Centre (NCS), Ministry of Earth Sciences.
- The seismic network in Delhi & surroundings was strengthened by deploying 11 temporary additional stations covering the known faults in the region to precisely locate the earthquakes & their aftershocks.
- Data from these stations are received in near real-time & used for locating the micro & small earthquakes in the region.
The expanded network has improved the accuracy of the epicentre location to ~2 km.

A geophysical survey, namely, Magneto-telluric (MT) is also being conducted over the Delhi region.

Magneto-telluric (MT) is a geophysical method which uses natural time variation of the Earth’s magnetic & electric fields to understand geological (underground) structure & processes.

Microzoning has been done in Delhi & the city is divided into nine parts according to the intensity of quakes.

Among them, three areas, including densely populated Yamunapar, are the most dangerous.

Five zones are medium risk, one zone is safe.

**What is Earthquake Microzoning?**

- Microzoning means micro classification.
- In this, the surface structure of the ground is investigated.
- Soil samples are collected by drilling into the ground every 200 to 500 meters in the field & after scientific investigation it is decided how sensitive the location is.
- For example, if the building is built on a damp surface, i.e., on the ridge area or on any soil that absorbs water for a long time, then the danger is greater.
- On the other hand, where the soil is dry or sandy, or the rocks are below, it has different effects.

**Earthquake Zone**

- According to the risk of earthquake, the country is divided into four parts, zone-2, zone-3, zone-4 & zone five.
- Of these, the **least threatened is Zone 2 & the highest risked is Zone-5**.
- **North-East, Jammu & Kashmir, Uttarakhand & parts of Himachal Pradesh** fall under Zone-5.
- **Delhi falls in Zone-4**, central India falls under relatively low danger zone of Zone-3, while most of the south falls in Zone-2 with limited danger, but it is a thicker classification.
- **There are some areas in Delhi which can be as dangerous as Zone-5**.
- Thus, there may be many places in the south states which may be hazardous like zone-4 or zone-5.

**Bharatmala Pariyojana**

- Bharatmala Pariyojana is a new **umbrella program for the highways sector**.
- It focuses on optimizing efficiency of freight & passenger movement across the country.
- It will **bridge critical infrastructure gaps** through effective interventions like development of Economic Corridors, Inter Corridors & Feeder Routes, Border & International connectivity roads, Coastal & Port connectivity roads & Green-field expressways.
- The implementation of a **pan-nation scheme** to improve the road network.
- All key aspects of the scheme will be managed by the **Ministry of Road Transport & Highways (MoRTH)**.

**Highlights of Bharatmala Pariyojana**

- Improvement in efficiency of existing corridors through development of Multimodal Logistics Parks & elimination of choke point.
- Enhance focus on **improving connectivity in North East** & leveraging synergies with Inland Waterways.
- Emphasis on use of technology & scientific planning for Project Preparation & Asset Monitoring
- Delegation of powers to expedite project delivery - **Phase I to complete by 2022 (now 2023)**
- Improving connectivity in the North East.

**Bharatmala project Category**

- Economic Corridor
- Feeder Route or Inter Corridor
- National Corridor Efficiency Improvement
- Border Road & International Connectivity
- Port Connectivity & Coastal Road
- Green Field Expressway
- Balance NHDP Works

**Dedicated Freight Corridor**

- Under Ministry of Railways.
- The project involves the construction of six freight corridors traversing the entire country.
- The purpose of the project is to provide a safe & efficient freight transportation system.
- Initially, the construction of two freight corridors,
  - Western DFC connecting the states of Haryana & Maharashtra &
  - Eastern DFC connecting the states Punjab & West Bengal, is being undertaken.
- The other four corridors include
  1. North-South (Delhi-Tamil Nadu),
  2. East-West (West Bengal-Maharashtra),
  3. East-South (West Bengal-Andhra Pradesh) &
  4. South-South (Tamil Nadu-Goa).
- These four corridors are still in the planning stage.
- In 2006, the Government of India established a dedicated body to implement the project, called the Dedicated Freight Corridor Corporation of India (DFCCIL).
Significance

- The diversion of freight to DFCs on trunk routes will free up the existing network for the kind of capacity expansion needed for passenger movement.
- It will also integrate the Industrial Corridors.

In short

- Logistics costs will be reduced.
- Reduction in unit cost of transportation,
- Smaller organization & management cost,
- Higher efficiency & lower energy consumption.
- Faster movement of goods.
- It is environmentally friendly.
- Helps in generating more employment.

Western Dedicated Freight Corridor (WDFC):

- Dadri, U.P to Jawaharlal Nehru Port, Mumbai-1,468 km
- The WDFC covers Haryana, Rajasthan, Gujarat, Maharashtra & Uttar Pradesh.
- It is being funded by the Japan International Cooperation Agency.

Eastern Dedicated Freight Corridor (EDFC):

- Ludhiana Punjab to Dankuni West Bengal-1,760 km
- The EDFC route covers Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand & West Bengal
- The EDFC route has coal mines, thermal power plants & industrial cities.
Feeder routes are also being made for these.

EDFC is being funded by World Bank.

Connecting Link for Eastern & Western Arm is under construction between Dadri & Khurja.

LHPs are model housing projects with houses built with shortlisted innovative alternate technology suitable to the geo-climatic & hazard conditions of the region.

The LHPs are being constructed at Indore (Madhya Pradesh), Rajkot (Gujarat), Chennai (Tamil Nadu), Ranchi (Jharkhand), Agartala (Tripura) & Lucknow (Uttar Pradesh).

They comprise about 1000 houses at each location along with allied infrastructure facilities.

LHPs deliver houses with speed, economy & with better quality of construction in a sustainable manner.

These LHPs will provide the scope for incubating new technologies for construction & innovation.

The period of construction is maximum 12 months.

Approvals will be accorded through a fast-track process by the concerned states (cooperative federalism).

Six Technology providers have been selected through online bidding process for construction of LHPs.

<table>
<thead>
<tr>
<th>LHP Location</th>
<th>Technology Selected</th>
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</thead>
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<td>1. Indore</td>
<td>Prefabricated Sandwich Panel System</td>
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<td>2. Rajkot</td>
<td>Monolithic Concrete Construction</td>
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</tr>
<tr>
<td>5. Agartala</td>
<td>Light Gauge Steel Structural System &amp; Pre-engineered Steel Structural System</td>
</tr>
</tbody>
</table>

What are Light house projects?

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Six Technology providers have been selected through online bidding process for construction of LHPs.
6. Lucknow | Stay In-place Formwork System

These technologies will be sourced from various developed countries like France, Germany, U.S., etc.

**Other measures by the government towards affordable housing**

- The new **Real Estate (Regulation & Development) Act (RERA)** is aimed at protecting the buyers.
- Taxes on affordable & regular houses has been reduced from 8 to 1 percent & GST from 12 to 5 per cent.
- Central rental housing complex project was conceived to address the issues faced by migrant labourers.

{Geo – Infra – 2021/01} National Infrastructure Pipeline (NIP)

**Source & Credits**

- **Context:** Finance Minister chairs review meeting of the National Infrastructure Pipeline (NIP)
- Agenda was to discuss the progress of NIP.
- Projects, expenditure incurred so far and the initiatives taken to expedite the project implementation.

**About National Infrastructure Pipeline (NIP)**

- The **National Infrastructure Pipeline (NIP)** is a group of social & economic infrastructure projects in India over a **period of five years** with a sanctioned amount of ₹102 lakh crore (US$1.4 trillion).
- It will improve project preparation, attract investments (both domestic & foreign) into infrastructure, & will be crucial for attaining the tar-
get of becoming a $5 trillion economy by FY 2025.

- Covers both economic & social infrastructure projects.
- It also includes both **greenfield & brownfield projects**.
- The Centre & states are expected to have almost equal share in implementing NIP, while the private sector contribution is expected to be around 21%.

**Home solution**

- 6 winners will design and build projects of 1,000 housing units each
- The State and the Centre each will provide assistance of ₹1.5 lakh
- The Centre will give an additional technology grant of ₹2.5 lakh for each house
- Incubation facilities will be provided to develop building technologies with support from four IITs
- The approved technologies will be displayed by Central Public Works Department along with the rates

**When was it announced?**

- In the budget speech of 2019-2020, Finance Minister announced an outlay of Rs 100 lakh Crore for infrastructure projects over the next 5 years.

**{Geo – Infra – 2021/01} One nation one Gas Grid**

- **Context:** PM dedicated the **Kochi-Mangaluru Natural Gas Pipeline** to the nation.
- The event marks an important milestone towards the creation of ‘**One Nation One Gas Grid**’.

**Kochi-Mangaluru Natural Gas Pipeline**

- The 450 km long gas pipeline will carry natural gas from **Kochi (Kerala) to Mangaluru (Karnataka)**.
- It is built by GAIL (India) Ltd.
- The total cost of the project was about Rs. 3000 crores.
- Laying of the pipeline necessitated it to cross water bodies at more than 100 locations.
- This was done through a special technique called **Horizontal Directional Drilling method**.

**One Nation One Gas Grid**

- Under One Nation One Gas Grid, all the willing rural households would be provided with cooking gas and electricity connection by **2022**, that is by the **75th year of India’s independence**.

**Objectives**

- **Remove regional imbalance** with regard to access for natural gas.
- Provide **clean and green fuel** throughout the country.
- **Connect** gas sources to major demand centres.
• Ensure availability of gas to consumers in various sectors.
• Develop City Gas Distribution Networks in various cities for the supply of CNG and PNG.
• Synchronously connect all the regional grids.

Need for Grid

• India is the third-largest emitter of greenhouse gases after the US and China
• The Grid would be helpful in meeting emission reduction targets that were signed at Paris Agreement.
• Natural gas can be used as a transition fuel before completely switching to solar or clean energy.
• India aims to increase the share of Natural gas usage to 15% by 2030.

Natural Gas

• Natural gas consists of primarily methane and ethane. (LPG is a mixture of butane and propane)
• Propane, butane, pentane, and hexane are also present.
• Natural gas is formed during the process of formation of Petroleum.
• Hence, it is often found dissolved in oil or as a gas cap above the oil.
• Sometimes, pressure of oil forces gas up to the surface.
• Such natural gas is known as associated gas or wet gas.
• Some reservoirs contain gas and no oil. This gas is termed non-associated gas or dry gas.
- Often natural gases contain substantial quantities of \textit{hydrogen sulphide} or other organic sulphur compounds. In this case, the gas is known as \textit{“sour gas.”}
- Coalbed methane is called \textit{‘sweet gas’} because of its lack of hydrogen sulphide.
  - \textbf{Oil + Gas} $\rightarrow$ \textit{Associated Gas or Wet Gas},
  - \textbf{Only Gas} $\rightarrow$ \textit{Non-Associated Gas or Dry Gas},
  - \textbf{Hydrogen Sulphide in gas} $\rightarrow$ \textit{Sour Gas},
  - \textbf{Coalbed Methane} $\rightarrow$ \textit{Sweet Gas}.
- On the market, natural gas is usually \textbf{bought and sold not by volume but by calorific value}.

\textbf{Uses of Natural Gas}

- Electric power generation.
- Many buses and commercial vehicles now operate on Compressed Natural Gas (CNG).
- Ammonia is manufactured using hydrogen derived from methane.
- Ammonia is used to produce chemicals such as nitric acid, urea, and a range of fertilizers.

\textbf{(Geo – Infra – 2021/01) Pradhan Mantri Awas Yojana (PMAY), Urban}

\textbf{IE | Prelims + Mains | GS3 > Government Policies and Interventions}

- \textbf{Context:} States and UTs to strategize speedy implementation of PMAY (U) for Rapid Urbanisation.
- A total of \textbf{1.1 crore houses} has been approved under Pradhan Mantri Awas Yojana Urban (PMAY-U).
- This scheme was \textbf{launched in 2015 by the Ministry of Housing and Urban Poverty Alleviation (MoHUPA)} to address the housing requirement of urban poor including slum dwellers.

- \textbf{It envisions “Housing for All 2022” (completion of 75 years of Independence)} by addressing the housing requirement of urban poor including slum dwellers through 4 verticals.
- The key components of this programme are as follows:
  - \textbf{In-situ as well as ex-situ slum rehabilitation with the participation of private developers.}
  - \textbf{Credit linked subsidy for affordable housing to poor.}
  - \textbf{Affordable housing in partnership with the private sector.}
  - \textbf{Subsidy for individuals for construction of the house.}
- The scheme is a \textbf{Centrally Sponsored Scheme except the “credit-linked subsidy” component which is a central sector component.}

\textbf{Beneficiaries}

- The beneficiaries of this scheme include the Economically Weaker Section (EWS), low-income groups (LIGs), and Middle-Income Groups (MIGs).
  - The annual income cap is up to Rs 3 lakh for EWS, Rs 3-6 lakh for LIG, and Rs 6-18 lakhs for MIG.
  - EWS category of beneficiaries is eligible for assistance in all four verticals of the Missions.
  - \textbf{LIG and MIG categories are eligible under only Credit linked subsidy scheme (CLSS) component.}
- The identification is based on a \textbf{self-certificate} submitted by an individual at the time of the loan application.
- Further, the beneficiary family should not own a pucca house in the name of any member of the family.
Coverage and Phases

- The PMAY-U covers all 4041 statutory towns as per Census 2011 with a focus on 500 class-I cities.
- It has three phases as follows:

1. Phase I (April 2015 – March 2017) to cover 100 Cities selected from States/UTs as per their willingness.
2. Phase II (April 2017 – March 2019) to cover additional 200 Cities
3. Phase III (April 2019 – March 2022) to cover all other remaining Cities.
Places in NEWS: Naku La

- **Context:** Recently, a clash took place between forces of India and China at Naku La, Sikkim.
- It is situated at the border of India (Sikkim) and Tibet.
- Nathu La, Goecha La, Dongkhala, and Jelep La are the other passes situated in Sikkim.

Provinces of Pakistan

- **Context:** A Hindu temple was demolished by a mob in the Khyber Pakhtunkhwa province of Pakistan.
• Pakistan has four provinces:
  1. Punjab,
  2. Khyber Pakhtunkhwa (which now includes the Federally Administered Tribal Areas or FATA),
  3. Balochistan, &
  4. Sindh.
• Though both PoK (Azad Kashmir) & Gilgit–Baltistan are ruled directly from Islamabad, neither is officially listed as the territory of Pakistan.
• They are both considered as “autonomous territories”.
• For India, on the other hand, as per the resolution passed by Parliament in 1994, PoK & Gilgit–Baltistan are both part of the State of Jammu & Kashmir, which is an integral part of India.

Bo Hai Sea (Bohai Sea)

• Context: India urged China to aid 39 crew members of cargo vessels stranded for months in a port on the Bo Hai Sea (Bohai Sea).
• The Bohai Sea is a marginal sea which is the north-western extension of the Yellow Sea.
• The Bohai Sea is connected to the Yellow Sea via the Bohai Strait.

Science & Technology Current Affairs by Pmfias.com – January 2021

(S&T – COVID – 2021/01) COVID-19 Vaccine in news

IE | Prelims + Mains: Basics: COVID-19

• Context: Drug Controller General of India has given the “restricted emergency use” approval to two vaccines i.e., Covishield & Covaxin against Covid-19.

Vaccines

• Vaccines prevent or mitigate infections.
• They are designed to induce an immune response in the body against the viruses.
• When vaccinated, the immune system of the body produces a specific response, consisting of specific T cells & specific antibodies that fight off the infection when exposure to the virus occurs at a later stage.
• Importantly, vaccination also leads to the induction of a specific immunological memory against the viruses represented in the vaccine.
• There are about a half-dozen basic types of vaccines, including killed viruses, weakened viruses, & parts of viruses, or viral proteins.
• A lot of trial & error is involved in making a vaccine. Hence it could take years to invent a vaccine.
• A new approach being taken by Moderna Pharmaceuticals is to copy genetic material from a virus & add it to artificial nanoparticles.
• This makes it possible to create a vaccine based purely on the genetic sequence rather than the virus itself.

Differences between Vaccine & Drugs
<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Vaccines are almost <strong>always biological products</strong></td>
<td>• Drugs may be chemical or biological</td>
</tr>
<tr>
<td>– Subject to widespread variation even between batches.</td>
<td>• Chemical drugs have remarkable identity between batches &amp; even between manufacturers.</td>
</tr>
<tr>
<td>• All vaccines require special conditions of storage</td>
<td>• Chemical drugs do not usually require cold storage.</td>
</tr>
<tr>
<td>– usually cold storage.</td>
<td>• Some biological drugs may require cold storage e.g., <strong>Insulin</strong>.</td>
</tr>
<tr>
<td>• Vaccines are large molecules usually administered parenterally</td>
<td>• Most chemical drugs are administered orally as tablets, capsules, suspensions etc.</td>
</tr>
<tr>
<td>(put inside the body, but not by swallowing. E.g., injection).</td>
<td></td>
</tr>
<tr>
<td>• Some vaccines may be given orally (e.g., polio vaccines) or nasally.</td>
<td></td>
</tr>
<tr>
<td>• Vaccines given mostly to <strong>PREVENT</strong> the disease.</td>
<td>• Some drugs are given through various other routes e.g., IV, IM., SC, dermally etc.</td>
</tr>
<tr>
<td>• Vaccines are supposed to protect whole populations (&quot;herd immunity&quot;)</td>
<td>• Drugs are given to treat, diagnose or prevent disease.</td>
</tr>
<tr>
<td>• <strong>Examples</strong>: Covaxin, ChAdOx1, SputnikV.</td>
<td>• <strong>Examples</strong>: Itolizumab, Hydroxychloroquine, Dexamethasone, Remdesivir</td>
</tr>
</tbody>
</table>

**What is the mRNA vaccine?**

- The genetic blueprint (or code) in living organisms is stored in a double-stranded molecule called DNA (deoxyribonucleic acid), which makes proteins that are responsible for nearly every function in the human body.
- The conversion of DNA code into proteins requires a single-stranded molecule called the **mRNA (messenger ribonucleic acid)**.
- In an analogy with computers, one may think of the DNA as the hardware, the mRNA as the software & proteins as the applications.
- The mRNA-1273 is a piece of RNA that carries the code to make the COVID-19 **virus Spike protein** when introduced into cells.
- This protein present on the virus surface is critical for its entry into cells.

**Covishield**

- Developed by Oxford University in collaboration with Astrazeneca.
- **India’s Serum Institute** is their manufacturing and trial partner.
- Covishield vaccine has been developed by using a **weakened version of the adenovirus**.
- **Adenovirus** causes infections in chimpanzees and its genetic material is same as that of the spike protein of SARS-CoV-2 coronavirus.
- **Spike protein** is the part of SARS-CoV-2 using which the virus enters a human body cell.
**Covishield vs Covaxin**

### Vaccine
- **Covishield** contains the genetic material of the SARS-CoV-2 virus spike protein.
- After vaccination, the surface spike protein is produced, priming the immune system to attack the SARS-CoV-2 virus if it later infects the body.
- Covishield will cost around Rs 400-450.
- Efficiency of Covishield has been pegged at over **70 per cent**.

### Covaxin
- Covaxin is India’s first **indigenous vaccine** against Covid-19.
- Developed by **Bharat Biotech** in collaboration with the **Indian Council of Medical Research** and National Institute of Virology, Pune.
• Covaxin is an **inactivated vaccine**.
• An inactivated vaccine is one which is developed by inactivating the live microbe that cause the disease.
• This destroys the pathogen’s ability to replicate but keeps it intact so that the immune system can still recognise it and produce an immune response.
• Cost: Rs 100-200.
• No efficacy rate has been made public.
• Covaxin is **two-dose** Covid-19 vaccines.
• Require to be kept at 2-8 degree Celsius

**Modern & Pfizer Vaccine**

- The Moderna and Pfizer vaccines use the same technology, based on messenger RNA, or mRNA.

- Such vaccines make use of the messenger RNA molecules that tell the body’s cells what proteins to build.
- The mRNA, is coded to tell the cells to recreate the spike protein of the coronavirus SARS-CoV-2, which causes Covid-19.
- It is the spike protein which appears as spikes on the surface of the coronavirus.
- **Spike Protein initiates the process of infection.**
- Spike Protein allows the virus to penetrate cells, after which it goes on to replicate.
- A coronavirus vaccine based on mRNA, once injected into the body, will **instruct the body’s cells to create copies of the spike protein.**
- In turn, this is expected to **prompt the immune cells to create antibodies to fight it.**
- These antibodies will remain in the blood and fight the real virus if and when it infects the human body.

**Sputnik-V**

- This vaccine has been developed by Moscow’s **Gamaleya Institute.**
- The vaccine is based on the DNA of a SARS-CoV-2 type **adenovirus**, a common cold virus.
- In this vaccine, **adenovirus is used as a tool to deliver genes or vaccine antigens to the target host tissue.**
- The vaccine uses the weakened virus to deliver small parts of a pathogen & stimulate an immune response.
- The vaccine is administered in two doses & consists of two types of a human adenovirus, each carrying an **S-antigen of the new coronavirus**, which enter human cells & produce an immune response.

**ZyCoV-D**
• DNA Vaccine ZyCoV-D by Zydus Cadila is approved for Phase III clinical trials.

• ZyCoV-D is a plasmid DNA vaccine, under the Vaccine Discovery Programme supported by the Department of Biotechnology under the National Biopharma Mission.

• Plasmids are circular deoxyribonucleic acid (DNA) vectors that can be used as vaccines.

• Scientists insert the virus genetic material into plasmids that they have obtained from bacteria.

• The plasmid is then inserted into the body and this triggers an immune response.

• Vaccine can remain stable even at 30 degree Celsius for about three months.

• This can be a major factor when planning nation-wide vaccine distribution as it would have minimal cold chain requirements when it reaches the hinterland.

National Biopharma Mission

• The National Biopharma Mission (NBM) is an industry-Academia Collaborative Mission for accelerating biopharmaceutical development in the country.

• Under this Mission the Government has launched Innovate in India (i3) programme to create an enabling ecosystem to promote entrepreneurship and indigenous manufacturing in the sector.

• The mission will be implemented by Biotechnology Industry Research Assistance Council (BIRAC).

• The mission was approved in 2017 at a cost of Rs 1500 crore and is 50% co-funded by World Bank loan.

• The mission is focused on the following 4 verticals:
  1. Development of product leads for Vaccines, Biosimilars and Medical Devices.

  2. Upgradation of shared infrastructure facilities and establishing them as centres of product discovery/discovery validations and manufacturing.

  3. Develop human capital by providing specific trainings to address the critical skills gap among the nascent biotech companies across the product development value chain.

  4. Technology Transfer Offices to help enhance industry academia inter-linkages.

Co-WIN

• The Union Health Ministry has developed a digital platform application Co-WIN.

• It is developed for real-time monitoring of Covid-19 vaccine delivery, recording data & to enable people to get themselves registered for vaccination.

What are the challenges faced by India in delivering the vaccine?

• The main challenge is to work with a new vaccine and provide it across age groups.

• Current vaccination program which focuses primarily on pregnant women and children.

• There are issues related to financial and human resources.

• Skill manpower to handle vaccination is lacking.

• Storage issue related to cold chain infrastructure.

• Some vaccines, such as the ones made using mRNA technology need to be stored in extremely cold temperatures, (-70 degree Celsius) which cannot be made available in every region.

• Most facilities in India are said to be equipped to operate at a maximum of -40 degree Celsius.
Most important challenge is Vaccine hesitancy

- According to WHO Vaccine hesitancy is delay in acceptance or refusal of vaccines despite the availability of vaccination services.
- It is complex and context specific varying across time, place and vaccine.
- It is one of 10 threats to global health.

Reasons for vaccine Hesitancy

- **Misinformation** related to:
  1. **Religious factor**: Vaccines contains microbes & animal products which is forbidden in religious customs.
  2. **Vaccine derived poliovirus**: For instance, Oral Polio Vaccines (OPV) contains weakened but live poliovirus, which have caused polio disease earlier.
  3. **Social media**: Misinformation spread through social media stirring fear in the minds of people by falsely blaming vaccines for unrelated diseases.
  4. **Accessibility**: Vaccines are often not available within the reach of communities causing inconvenience to peoples, thus avoiding vaccination.

Which is the Best Vaccine Suited for India?

- Comparing the top three vaccines based on:

Efficacy Rates

<table>
<thead>
<tr>
<th></th>
<th>Pfizer/BioNTech</th>
<th>Moderna</th>
<th>AstraZeneca/Oxford</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>mRNA</td>
<td>mRNA</td>
<td>Adenoviral vector</td>
</tr>
<tr>
<td>Efficacy</td>
<td>95%</td>
<td>95%</td>
<td>62% to 90%</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-94°F</td>
<td>-4°F</td>
<td>36°F to 46°F</td>
</tr>
<tr>
<td>Shelf-life</td>
<td>5 days</td>
<td>1 month</td>
<td>6 months</td>
</tr>
<tr>
<td>Price per dose</td>
<td>$19.50</td>
<td>$32 to $37</td>
<td>$3 to $4</td>
</tr>
<tr>
<td>For profit?</td>
<td>Yes</td>
<td>Yes</td>
<td>After pandemic ends</td>
</tr>
<tr>
<td>Doses by end of 2020</td>
<td>50 million</td>
<td>20 million</td>
<td>200 million</td>
</tr>
</tbody>
</table>

Sources: American Council on Science and Health (ACSH.org), multiple news outlets

Pricing

- Pfizer’s candidate is the steepest one right now, costing $20 per dose.
- Moderna’s make comes up to cost somewhere around $15-$17 per dose.
- Oxford-Astrazeneca' shot is by far the cheapest vaccine under offering, as little as $5- $6 (Rs.1000).

Side Effects

- Both Moderna & Pfizer-BionTech haven’t reported the occurrence of undue or alarming side-effects.
- Neither have reports of adverse reactions emerged from people who have been vaccinated right now.
- In comparison to this, the Oxford-Astrazeneca vaccine has been surrounded by controversies in the past months with the many ‘strange’ side-effects being reported from volunteers

Storage & shelf-life

- Storage & shelf-life are prime factors that determine how effective a vaccine would be in real-world settings.
- Many experts claimed that Pfizer’s vaccine model will not be well-suited for developing nations, since it requires extreme temperature settings to be stored in & additional shipping ingredients.
- The vaccine can be stored for use for up to 5 days’ time in a regular refrigerator, for 30 days in a dry-ice freezer, or 6 months’ time in ultra-cold freezers, which are not feasible to arrange everywhere.
- Moderna faces similar challenges but is slightly less expensive to ship & can stay stable for a longer time, as compared to Pfizer.
- Oxford’s dose, wins since it is a vaccine prepared using traditional settings, can be stored...
for use for longer months, easily delivered & administered.

Vaccine Candidates in Late-Stage Trials

Sources: University of Oxford, AstraZeneca, Pfizer, Bloomberg research

(S&T – Diseases – 2021/01) Avian influenza (H5N8) – Bird Flu

TH | Prelims | GS2 > issues related to Health

- **Context:** Avian influenza (H5N8) has been confirmed among ducks in Kottayam.
- Bird flu/Avian influenza (H5N8) is a **highly contagious viral disease** affecting several species of **food-producing birds** (chickens, turkeys, quails, guinea fowl, etc.) as well as **pet birds** & **wild birds**.
- While it can prove **lethal for birds**, the H5N8 strain of avian influenza has a lower likelihood of spreading to humans as compared to H5N1.
- Human infections are primarily acquired through direct contact with infected poultry.
- Avian influenza virus subtypes include A(H5N1), A(H7N9), & A(H9N2) A(H5N8)

**Government Response**

- Directions have been given to enforce culling of sick birds as per the **2015 National Avian Influenza Plan**.
- The plan is prepared & revised by **Department of Animal Husbandry & Dairying (not MoEF)**.
- The plan provides guidance to state govt in prevention, control, & containment of avian influenza.
- Fishing will be banned in the affected region.

**Influenza (Flu) in Humans**

- Flu is a **contagious respiratory illness** caused by **influenza viruses** that infect the nose, throat, & sometimes the lungs.
- Influenza viruses are classified into subtypes based on two surface proteins, **Hemagglutinin (HA) & Neuraminidase (NA)**.
- It can cause mild to severe illness, & at times can lead to death.

**Source & Credits**

- There are four types of influenza viruses namely A, B, C & D.
  1. **Influenza A viruses:** These are the **only influenza viruses that cause flu pandemics** that is global epidemics of flu disease.
  2. **Influenza B viruses:** They are not classified into subtypes & can be broken down into lineages.
  3. **Influenza C viruses:** This type of virus is detected less frequently & usually causes mild infections & does not present public health
risk. Or we can say that they do not cause human flu epidemic.

4. **Influenza D viruses:** They primarily affect cattle & does not infect or cause illness in people.

- Influenza A & B viruses causes acute respiratory infection & the seasonal epidemic of disease.

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**TRAI: Telecom Regulator Authority of India**

- TRAI is the independent regulator of the telecommunications business in India.
- TRAI was established on 1997 by an Act of Parliament to regulate telecom services & tariffs in India.
- Earlier regulation of telecom services & tariffs was overseen by the Central Government.
- TRAI’s mission is to create & nurture conditions for growth of telecommunications in India to enable the country to have a leading role in the emerging global information society.
- One of its main objectives is to provide a fair & transparent environment that promotes a level playing field & facilitates fair competition in the market.
- TRAI regularly issues orders & directions on various subjects such as tariffs, interconnections, quality of service, Direct to Home (DTH) services & mobile number portability.

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**Interconnection Usage Charge (IUC)**

**TH | Prelims | GS3 > Awareness in the fields of IT, Space, Computers**

- **Context:** Telecom operators not to pay interconnect usage charge from 1st January.
- **IUC is a charge payable by a service provider, whose subscriber originates the call, to the service provider in whose network the call terminates.**
- This is paid to cover the network usage costs as the operator, on whose network the call terminates, carries the call on its network to the customers.
- **IUC is one of the main sources of income for** telecom companies.
- In a **calling-party pays regime (CPP),** if you originate a call, you pay your access provider, who in turn pays termination charges to the network you placed the call.
- The term ‘**interconnection**’ refers to an arrangement under which telecom players connect their equipment, networks, & services with other Telecom Services Providers.
- **TRAI regulates the IUC** & addresses the various issues related to interconnection arrangements.
- **IUC ensures operators make appropriate investments to carry voice calls without terminations.**

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**GI Tagging for tribal Products by TRIFED**

**PIB | PIB | Prelims | GS3 > Intellectual Property Rights (IPR) > GI | GS2 > policies for development**

- **Context:** TRIFED is collaborating with different Ministries and Departments to jointly execute schemes and programmes for transforming tribal lives.

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**GI Tagging for tribal Products**

- TRIFED had taken up the cause of promotion of GI Tag products along with tribal products and transform them into a brand.
- TRIFED, along with Ministry of Culture, has identified 8 heritage locations across the country, where GI specific Tribes India stores will be set up.
• Among these 8 heritage places, work is shortly expected to commence in
  ✓ Sarnath, Uttar Pradesh,
  ✓ Hampi, Karnataka,
  ✓ Golconda Fort, Telangana.

What is TRIFED?

• The Tribal Cooperative Marketing Development Federation of India (TRIFED) was established in 1987 under the Multi-State Cooperative Societies Act, 1984.
• It is a national level apex organization functioning under the administrative control of Ministry of Tribal Affairs (MTA).
• Its basic mandate is to bring about socio-economic development of tribal people of the country.
• TRIFED works towards socio-economic development of tribal people by way of marketing development of the tribal products (such as 'Minor Forest Produce (MFP)).

Other Initiatives by TRIFED

Development of Designer’s lab

• Designer’s lab is a place wherein select tribal artisans will give live demonstrations of their rich craft traditions.
• It has been planned to develop a designer’s lab at Lal Qila (Red Fort), Delhi, in close collaboration with the Ministry of Culture.
• Pochampally in Andhra Pradesh, famous for Ikat fabric, has been chosen to be the second venue for designer’s hub.

Aadi Mahotsav festival

• The Aadi Mahotsav festival, is an initiative commenced by TRIFED in 2017.
• It aims to familiarize the people with the rich and diverse craft and culture and cuisine of tribal communities.

Marketing & Logistics intervention for promoting Tribal products of North – Eastern States

• This will be done in collaboration with Ministry of Development of North Eastern Region (DoNER) and India Post.
• The aim of this initiative is to create a brand for products from that region, increase awareness of the brand across the globe.