

28th June - 04th July Weekly Compilation

(The Hindu+ Indian Express + PIB + Other World Wide News)

❖ POSHAN Tracker App

(Source: The Hindu)

Why in News: Anganwadi workers in several States are concerned. A government order threatened them with a pay cut if they did not download the 'Poshan Tracker' app to record delivery of services by them.

Poshan Tracker App

The Poshan Tracker App has been launched by the Ministry of Women and Child Development (MoWCD). The app enables real-time monitoring and tracking of the services provided by the Anganwadi Centre (AWC), Anganwadi Workers (AWWs), and beneficiaries.

The use of technology for real-time growth monitoring and tracking of beneficiaries is an important feature of the Poshan Abhiyaan.

Concerns Raised by the Anganwadi workers

Firstly, they wanted to know who would give them the mobile phones and bear the expenses for recharge. Secondly, who would train Anganwadi workers to use smart phones, as many workers only know how to use the mobile phones with keypads.

Thirdly, many anganwadi centers are situated in remote locations and often don't have Internet connectivity. They need to walk 500 meters to 1 km to get some network coverage.

❖ Paintings in News

(Source: Live Mint)

Why in News: For perhaps the first time, folk and tribal artists around the country have been united by a common theme: covid-19.

Key Paintings seen in News Recently

Madhubani Painting

- Madhubani painting is also referred to as Mithila Art as it flourishes in the Mithila region of Bihar.

- The paintings are done with mineral pigments prepared by the artists. The work is done on freshly plastered or a mud wall. For commercial purposes, the work is now being done on paper, cloth, canvas, etc.
- This style of painting has been traditionally done by the women of the region. Today, men are also involved to meet the demand.
- These paintings are popular because of their tribal motifs and use of bright earthy colours. The colours used in paintings comprise natural extracts from plants and other natural sources. E.g.: Black colour is obtained by mixing soot with cow dung; blue from indigo, among others.
- Figures from nature & mythology are adapted to suit their style. The themes & designs widely painted are of Hindu deities such as Krishna, Rama, Saraswati, wedding scenes among others.

Pattachitra Painting

Phad Painting

- Phad painting or phad is a style of religious scroll painting and folk painting practiced in Rajasthan.
- This style of painting is traditionally done on a long piece of cloth or canvas known as phad.
- The paintings depict the narratives of the folk deities of Rajasthan, mostly of Devnarayan Ji (a reincarnation of Vishnu) and Pabuji (a local hero).
- The Bhopas, the priest-singers, traditionally carry the painted phads along with them and use these as the mobile temples of the folk deities, who are worshipped by the Rebari community of the region. Traditionally, the phads are painted with vegetable colors.

Gond Paintings

Gond paintings are a form of painting from folk and tribal art that is practiced by the Gond tribe. The paintings can best be described as 'on line work' that has an immediate effect on the viewer.

❖ Stock Limit on Pulses

(Source: The Hindu)

Why in News: Centre has imposed stock limits on all pulses except moong held by wholesalers, retailers, importers, and millers till October. The stock limit of 200 tones, for any one variety of pulses, has been imposed on wholesalers.

An order in this regard has been issued by the Union Food and Consumer Affairs Ministry.

- **The Department of Consumer Affairs issued the Removal of Licensing Requirements, Stock Limits, and Movement Restrictions on Specified Foodstuffs (Amendment) Order, 2021.** It prescribes the limits imposed on the stock of a commodity with immediate effect.
- **The order has been issued in exercise of the powers conferred by section 3 of the Essential Commodities Act, 1955**
- If the stocks of entities exceed the prescribed limits, it has to be declared on the online portal of the Department of Consumer Affairs. Further, the stock has to be brought within the prescribed limit within 30 days of the notification of the order.

There was a sustained increase in the price (inflation) of pulses in March-April. The need for an urgent policy decision was felt to send the right signal to the market. Therefore, this decision will prevent hoarding and check price rise.

❖ **FREIGHT SMART CITIES INITIATIVE** **(Source: PIB)**

Why in News: The Logistics Division under the Ministry of Commerce & Industry has released the roadmap for the 'Freight Smart Cities Initiative'.

'Freight Smart Cities Initiative'

- Freight Smart Cities Initiative aims to improve the efficiency of urban freight and create an opportunity for a reduction in logistics costs.
- Under the initiative, State Governments will identify ten cities, initially, to be developed as Freight Smart Cities.
- In these ten cities, city-level logistics committees would be formed. These committees would have members from the government as well as from the private sector.
- These committees would co-create City Logistics Plans like developing peri-urban freight centers, night-time deliveries, developing truck routes, Promoting electrification of urban freight among others.
- Further, the initiative will be expanded to 75 cities in the next phase before scaling up throughout the country. It will include all state capitals and cities that have more than one million populations.

Due to urbanisation, requirements of rapid economic growth including e-commerce and associated first and last-mile freight movements are increasing. It is expected that the demand for urban freight is expected to grow by 140% over the next 10 years. However, increasing congestion, high logistics cost, noise, and sound pollution in the Indian cities are affecting the urban freight sector. Hence, the initiative has been launched to improve the efficiency of urban freight and create an opportunity for a reduction in logistics costs.

❖ HEAT DOME

(Source: Express)

Why in News: Parts of Canada and USA are reeling under severe heat wave caused due to a heat dome. Possible causes and likely impact are discussed.

High temperatures are being reported from the Pacific Northwest (in USA) and some parts of Canada. This is a part of a “historic” heat wave that lasted over a week, a result of a phenomenon referred to as a “heat dome”.

Heat Wave

- According to The National Oceanic and Atmospheric Administration (NOAA), a heat dome occurs when the atmosphere traps hot ocean air like a lid or cap.
- Heat dome is more likely to form during La Niña years like 2021, when waters are cool in the eastern Pacific and warm in the western Pacific.
- The phenomenon begins when there is a strong change (or difference) in ocean temperatures. In the process known as convection, the temp difference causes more warm air, heated by the ocean surface, to rise over the ocean surface.
- That temperature difference creates winds that blow dense, tropical, western air eastward. Eventually that warm air gets trapped in the jet stream: a current of air spinning counterclockwise around the globe and ends up on the U.S. West Coast, resulting in heat waves.
- A heat wave is a period of unusually hot weather that lasts for more than two days. Heat waves can occur with or without high humidity and have the potential to cover a large area exposing a high number of people to hazardous heat.

Impact of heat wave: So as long as the body is producing sweat, which is then able to evaporate quickly, the body will be able to remain cool even under high temperatures. But, there is a limit to this (a limit called the wet-bulb temperature) beyond which humans cannot tolerate high temperatures. Some heat-related illnesses include heat stroke, heat exhaustion, sunburn and heat rashes. Sometimes, heat-related illnesses can prove fatal.

Wet Bulb temperature is the lowest possible temperature that a surface can reach by evaporative cooling (i.e. that a wetted surface can reach with air passing over it) in a given spot.

To understand what causes a heat dome, one should liken the Pacific ocean to a large swimming pool in which the heater is turned on. Once the heater is on, the portions of the pool close to the heat source will warm up faster and therefore, the temperature in that area will be

higher. In the same way, the western Pacific ocean's temperatures have increased in the past few decades and are relatively more than the temperature in the eastern Pacific.

The 'heat dome'

Occurs when the atmosphere traps hot ocean air like a lid or cap

1 In summer, the **jet stream** (which moves the air) shifts northward

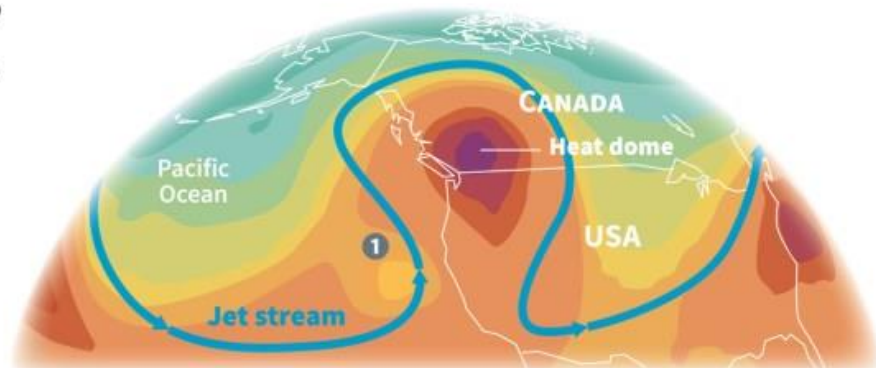
2 **Hot** and stagnant air **expands** upwards

3 Strong and **high-pressure** atmospheric conditions combine with influences from La Nina act like a dome or cap

4 In a process known as **convection**, hot air attempts to escape but high pressure pushes it back down

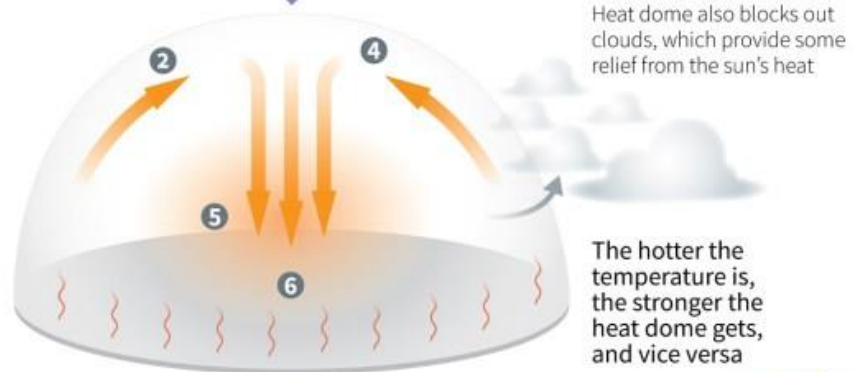
5 Under the dome, the air sinks and **compresses**, releasing more heat

6 As winds move the hot air east, the jet stream traps the air where it sinks, resulting in **heat waves**



3 **High pressure**

Temperature forecasts
(darker color = hotter)



Heat dome also blocks out clouds, which provide some relief from the sun's heat

The hotter the temperature is, the stronger the heat dome gets, and vice versa

Source: NOAA/US/Canada medias, experts

AFP

Impact of a heat dome

- Loss of life
- Damage to crops
- Rise in energy consumption
- Increase in wildfires

Heat dome also prevents clouds from forming, allowing for more radiation from the sun to hit the ground. It's challenging to link any one specific weather event with climate change, but over time the trend is showing longer-lasting, more intense heat.

❖ **United Information System for Education Plus (UDISE+)**

(Source: PIB)

Why in News: The Union Education Minister has released the report on United Information System for Education Plus (UDISE+) 2019-20 for School Education in India.

UDISE

- Unified District Information on School Education (UDISE) is one of the largest Management Information Systems on school education.
- UDISE was initiated in 2012-13 by the Ministry of Education by integrating DISE for elementary education and SEMIS for secondary education.
- It helps measure the education parameters from classes 1 to 12 in government and private schools across India.

UDISE+ is an updated and improved version of UDISE. It was developed in the year 2018-19 to speed up data entry, reduce errors, improve data quality and ease its verification. The present publication relates to the data for the reference year 2019-20.

Key Findings of the Report

Enrollment in Schools

- Gross Enrolment Ratio at all levels of school education has improved in 2019-20 compared to 2018-19.
- The GER is at 98% for students of Classes 1-8. For secondary and senior secondary students, GER stood at 78% and 51% respectively.
- Pupil-Teacher Ratio (PTR) has also improved at all levels of school education.
- The enrolment of girls increased at all levels of school education in 2019-20 compared to 2018-19. The increase was highest in the pre-primary level.
- Between 2012-13 and 2019-20, the Gender Parity Index (GPI) at both Secondary and Higher Secondary levels have also improved.

Facilities in Schools

- More than 80% of schools in India in 2019-20 had functional electricity. This is an improvement of more than 6% over the previous year 2018-19.
- The number of schools having functional computers increased to 5.2 lakh in 2019-20 from 4.7 lakh in 2018-19.
- The number of schools having internet facilities increased to 3.36 lakh in 2019-20 from 2.9 lakh in 2018-19.
- More than 90% of schools in India had hand wash facilities in 2019-20. This is a major improvement as this percentage was only 36.3% in 2012-13.

- More than 83% of schools had electricity in 2019-20, an improvement of almost 7% over the previous year, 2018-19. In 2012-13, about 54.6% of schools had electricity.
- More than 82% of schools conducted medical check-ups of students in 2019-20, an increase of more than 4% compared to the previous year 2018-19.

❖ **OxiJani**

(Source: PIB)

Why in News: A team from Jawaharlal Nehru Centre for Advanced Scientific Research, an autonomous institute under the Department of Science & Technology, has developed a device named 'OxyJani'.

OxyJani

- OxyJani is a mobile group oxygen concentrator that can be used in rural settings and also be rapidly deployed in emergencies in any location.
- It is based on the principles of Pressure Swing Adsorption (PSA) technology.
- The team replaced lithium zeolites (LiX) which is usually used in oxygen concentrators with sodium zeolites which do not generate toxic solid waste and can be manufactured in India.

Advantages of OxyJani

- Firstly, It is modular and capable of delivering a range of solutions such as conversion of medical air to medical oxygen.
- Secondly, It is an entirely off-grid solution including all modules that can facilitate deployment in rural areas.
- Thirdly, it is portable just like personal oxygen concentrators and affordable too. Lastly, the waste from the zeolite plant can be potentially a good agricultural input material.

❖ **DRONE Attack in India**

(Source: The Hindu)

Why in News: Last week, two drones dropped an IED each packed with high grade-explosives on an Indian Air Force base in Jammu. It was the first-ever attack in India where suspected terrorists had used drones.

- Drones have control and delivery mechanisms, and to counter them either you can counter the control mechanism by jamming, or can control the delivery mechanism. It depends on what kind of radar is being used, which is critical for the size of the UAV that needs to be detected.

- Any kind of counter-strategy should give enough warning to positively identify that it is not a bird. Also, if you are firing, you don't know what it is carrying. I
- Currently, border forces in India largely use eyesight to spot drones and then shoot them down. It is easier said than done, as most rogue drones are very small and operate at heights difficult to target.
- India has been exploring technologies to detect and disable drones using electromagnetic charges or shoot them down using laser guns. Technology to disable their navigation, interfere with their radio frequency, or just fry their circuits using high energy beams have also been tested. None of these has, however, proven foolproof.

Challenges in tackling small drones

Conventional radar systems are not meant for detecting small flying objects, and, even if they are calibrated that way, they might confuse a bird for a drone and the system may get overwhelmed.

Rules for Drone Regulations in India

Unmanned Aircraft System (UAS) Rules, 2020

- It is a set of rules notified by the government that aims to regulate the production, import, trade, ownership, establishment of the drone ports (airports for drones) and operation of UAS.
- It also seeks to create a framework for drones use by businesses.

National Counter Rogue Drones Guidelines 2019

- The guidelines had suggested a number of measures to counter rogue drones depending on the vitality of assets being protected.
- For places of critical national importance, the rules called for deployment of a model that consists of primary and passive detection means like radar, Radio Frequency (RF) detectors, electro-optical and infrared cameras.
- In addition to this, soft kill and hard kill measures like RF jammers, Global Positioning System (GPS) spoofers, lasers, and drone catching nets were also suggested to be installed.

Other Initiatives

Directed-Energy Weapon: Defence Research and Development Organisation (DRDO) has developed two anti-drone Directed-Energy Weapon (DEW) systems, with a 10-kilowatt laser to

engage aerial targets at 2-km range and a compact tripod-mounted one with a 2-kilowatt laser for a 1-km range. But they are yet to be productionized in large numbers.

Smash-2000 Plus

The armed forces are now also importing a limited number of other systems like Israeli 'Smash-2000 Plus' computerized fire control and electro-optic sights, which can be mounted on guns and rifles to tackle the threat from small hostile drones in both day and night conditions.

Global anti-drone systems

Drone Dome: Rafael, the defence company behind Israel's famed Iron Dome missile system, has also developed something called the Drone Dome. Like the Iron Dome, which identifies and intercepts incoming missiles, Drone Dome detects and intercepts drones. Beside offering a 360-degree coverage", the Drone Dome is also capable of jamming the commands being sent to a hostile drone and blocking visuals, if any, that are being transmitted back to the drone operator. Its highlight, however, is the precision with which it can shoot high-powered laser beams to bring down targets.

Drone Hunter: US-based Fortem Technologies uses an interceptor drone called the 'Drone Hunter' to pursue and capture hostile drones. The Drone Hunter fires from its 'Net Gun' a spider web-shaped net to capture targets midair and tow them.

Drone Gun: Besides the regular detection and surveillance, Drone Shield, an Australian publicly listed company, also offers a portable solution in the form of a drone gun that can be used to point and 'shoot'. The company's Drone Gun Tactical and Drone Gun MKIII engage in radio frequency disruption that will disrupt the hostile drone's video feed and force it to land on the spot or return to the operator.

❖ AGNI -P Missile

(Source: The Hindu; PIB)

Why in News: Defence Research and Development Organisation(DRDO) has successfully flight-tested a New Generation Nuclear-Capable Ballistic Missile Agni P from Dr APJ Abdul Kalam island off the coast of Odisha.

Agni-P: Agni P is a new generation advanced variant of the Agni class of missiles.

Features of Agni P Missile

- **Canister Based Missile:** Agni P is a canisters based missile. Canisterisation of missiles reduces the time required to launch the missile while improving its storage and mobility,

This means that it can be launched from rail and road and stored for a longer period. It can also be transported across the length and breadth of the country.

- **Weight:** The missile weighs 50% less than Agni III and has new guidance and a new generation of propulsion.
- **Range:** The missile has a range between 1000km to 2000km. It has been developed specifically to strike targets in Pakistan. Its range is too short to reach targets in the Chinese mainland.
- The Agni-P will replace the Prithvi, Agni-1 and Agni-2 missiles that were built two decades ago with technologies that are now considered outdated.

Agni Missiles

- Agni Missiles trace their origins back to the Integrated Guided Missile Development Program (IGMDP). IGMDP was conceived by APJ. Abdul Kalam in the 1980s to enable India to attain self-sufficiency in the field of missile technology.
- The missiles developed under this program include (a) Agni (b) Akash, (c) Trishul (d) Prithvi and (e) Nag.

❖ Censorship of Films in India

(Source: The Hindu)

Why in News: The Ministry of Information and Broadcasting has recently sought public comments on its draft Cinematograph (Amendment) Bill, 2021, which proposes to bring back its “revisionary powers” over the Central Board of Film Certification.

The new Bill will also “make the process of sanctioning of films for exhibition more effective, in tune with the changed times and curb the menace of piracy”.

Key Points

Background

The Supreme Court of India (SC) in November 2000, had upheld a Karnataka High Court order which struck down the Centre’s “revisional powers in respect of films that are already certified by the Board”. However, the SC had opined that the Legislature may, in certain cases, overrule or nullify the judicial or executive decision by enacting an appropriate legislation”.

Provision of Draft Cinematograph (Amendment) Bill, 2021

Granting Revisionary Powers: The government on account of violation of Section 5B (1) of the Cinematograph Act, 1952 can order for “re-examination” by the certification board of an already certified film, following receipt of complaints.

- Section 5B (1) deals with the principles for guidance in certifying films. It is derived from Article 19(2) of the Constitution and is non-negotiable.
- Under Section 6 of the existing Cinematograph Act, 1952, the Centre is already empowered to call for the record of proceedings in relation to certification of a film and pass any order thereon.
- The Central Government, if the situation warranted, has the power to reverse the decision of the Board.

Sub-division of Existing UA Category: The provisions relating to certification of films under “unrestricted public exhibition (U/A)” category are proposed to be amended so as to sub-divide the existing UA category into age-based categories like U/A 7+, U/A 13+ and U/A 16+.

Film Piracy: In most cases, illegal duplication in cinema halls is the originating point of piracy. At present, there are no enabling provisions to check film piracy in the Cinematograph Act, 1952. The draft Bill proposes to insert Section 6AA which prohibits un-authorized recording.

Punishment for Piracy: Section 6AA of the draft legislation makes piracy a punishable offence.

- The punishment of imprisonment for a term up to three years and with a fine which shall not be less than Rs 3 lakh but which may extend to 5% of the audited gross production cost or with both.
- The recommendations of the Justice Mukul Mudgal Committee of 2013 and the Shyam Benegal Committee of 2016 had also been considered while drafting the legislation.

Central Board of Film Certification (CBFC)

- It is a statutory body under the Ministry of Information and Broadcasting, regulating the public exhibition of films under the provisions of the Cinematograph Act 1952.
- The Board consists of non-official members and a Chairman (all of whom are appointed by Central Government) and functions with headquarters at Mumbai.
- Films can be publicly exhibited in India (on cinema halls, T.V. channels) only after they have been certified by the Central Board of Film Certification.

At present, films are certified under 4 categories: U, U/A, A& S.

- Unrestricted Public Exhibition (U)

- Unrestricted Public Exhibition - but with a word of caution that Parental discretion required for children below 12 years (U/A)
- Restricted to adults (A)
- Restricted to any special class of persons (S)

Provisions for Censorship

Article 19(2) of the Constitution authorises the government to impose, by law, reasonable restrictions upon the freedom of speech and expression in the interests of the sovereignty and integrity of India, the security of the State, friendly relations with foreign States, public order, decency or morality or in relation to contempt of court, defamation or incitement to an offence. **The Cinematograph Act, 1952 also provides for similar provisions as stated under Article 19(2).**

❖ NHP-Bhuvan Portal

(PIB)

Why in News: The Government of India has launched the NHP –Bhuvan portal of the National Remote Sensing Centre (NRSC).

NHP –Bhuvan Portal

- The National Hydrology Project or NHP-Bhuvan Portal is a repository of information on the initiatives undertaken by NRSC under NHP (National Hydrology Project).
- The portal also has a facility to download the reports and knowledge products being developed by NRSC.

National Hydrology Project (NHP)

- National Hydrology Project (NHP) is a Central Sector scheme. It was launched by the Department of Water Resources, River Development, and Ganga Rejuvenation, Ministry of Jal Shakti with the financial aid of the World Bank.
- To improve the extent and accessibility of water resources information and strengthen institutional capacity to enable improved water resources planning and management across India.

Components: The project comprises four broad components:

- Improving In Situ Monitoring System (IMS)
- Improving Spatial Information System (SIS)
- Promoting Water Resources Operation and Management Applications (WROMA)
- Strengthening Water Resources Institutions and Capacity Building

Implementing Agency: National Remote Sensing Centre (NRSC)

National Remote Sensing Centre (NRSC): NRSC is one of the primary centers of the Indian Space Research Organization (ISRO), Department of Space (DOS). NRSC has the mandate for:

- Establishment of ground stations for receiving satellite data,
- Generation of data products
- Development of techniques for remote sensing applications, including disaster management support.
- Geospatial services for good governance and
- Capacity building for professionals, faculty, and students.

❖ **Fund for Industrial Research Engagement (FIRE) Program (PIB)**

Why in News: Science and Engineering Research Board (SERB) in collaboration with Intel India has launched the Fund for Industrial Research Engagement (FIRE) Program.

Fund for Industrial Research Engagement (FIRE) Program

The FIRE program is a joint government and industry initiative with an aim to promote innovative technology solutions and strengthen academic research through collaboration with key research and development (R&D) organizations in India.

Key Features of the FIRE Program

- The program intends to select highly impactful research projects in every cycle (typically once or twice a year) which have breakthrough potential at a national or global level.
- These projects will be in the space of Artificial Intelligence (AI)/Machine Learning (ML), platform systems, circuits & architecture, Internet of Things (IoT), security, and so on from edge to cloud. Moreover, the selected projects will get support with funding, mentoring and industry connect.

Science and Engineering Board (SERB)

- **SERB is a statutory body established in 2009. It functions under the Department of Science and Technology, Ministry of Science and Technology.**
- It was set up for promoting basic research in science and engineering. It also provides financial assistance to scientists, academic institutions, Research and Development laboratories, industrial concerns, and other agencies for such research.

- It is chaired by the Secretary to the Government of India in the Department of Science and Technology. Further, it has other senior government officials and eminent scientists as members.

❖ **Global Economic Prospect**

(Source: Express)

Why in News: The World Bank releases a Global Economic Prospects (GEP) report twice a year. It is the most important source for evaluating the current and future outlook for emerging markets and developing economies (EMDEs). The recently released edition is significant because of the warnings it contains.

Key findings of the recent Global Economic Prospects report:

- The world economy is recovering from the pandemic. While the advanced economies (with successful or rapidly progressing covid vaccination program) appear to return to or even exceed their earlier growth rates.
- Emerging markets and developing economies (EMDEs) prospects are more mixed.
- The strongest-looking emerging-market region is East Asia and the Pacific followed by South Asia.
- The huge global disparity in vaccine access means that poorer countries are likely to face more waves of the coronavirus and its variants in the coming months and years.
- **Inflation:** If inflation in advanced economies persists, central banks may be compelled to tighten monetary policy. That could lead to higher capital inflows for advanced economies and the depreciation of EMDE currencies.
- The report shows that one big stumbling block to faster growth and progress for EMDEs is the high cost of a trade. Tariffs account for only one-fourteenth of the total cost of trade, with logistics, transport, bureaucracy and corruption making up the rest. As a result, a good sold to another country costs on average double what it does domestically.

Key findings of the Global Economic Prospects related to India

The World Bank estimates that covid will cause the number of people living in poverty to increase by 143-163 million in 2021. More than half of the newly poor in South Asia, mainly in India

The problem with India is not its economic fundamentals, which are strong, but the fact that poor management of its economy, and the pandemic means “confidence remains depressed, and balance sheets damaged.

❖ **Zydus Cadila**

(Indian Express)

Why in News: Zydus Cadila has applied to Central Drugs Standard Control Organisation (CDSCO) seeking emergency use authorisation (EUA) for ZyCov-D, its Covid-19 vaccine. If approved by the regulator, ZyCov-D will be the world's first DNA vaccine against infection with SARS-CoV-2.

ZyCov-D Vaccine

- ZyCov-D is a plasmid DNA vaccine, which means it uses a genetically engineered, non-replicating version of a type of DNA molecule known as a 'plasmid'.
- ZyCov-D has been developed by Zydus Cadila with the support of the Department of Biotechnology and the Indian Council of Medical Research (ICMR).

How does the ZyCov-D vaccine work

- In this vaccine, the plasmids are coded with the instructions to make the spike protein of SARS-CoV-2, the coronavirus that causes Covid-19.
- Vaccination gives the code to cells in the recipient's body, so they can begin making the spiky outer layer of the virus.
- The immune system is expected to recognize this as a threat and develop antibodies in response.

Most Covid-19 vaccines currently are given in two doses. In contrast, ZyCov-D will be given in three doses, with an interval of 28 days between each dose. Moreover, ZyCov-D is also an intra dermal vaccine which means it is applied using a 'needle-free injector'. Instead, a spring-powered device delivers the shot as a narrow, precise stream of fluid that penetrates the skin.