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VEDHIK
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FOREWORD

We, at Team Vedhik is happy to introduce a new initiative - "Daily Current Affairs_The Hindu" compilations to help you with UPSC Civil Services Examination preparation. We believe this initiative - "Daily Current Affairs_The Hindu" would help students, especially beginners save time and streamline their preparations with regard to Current Affairs. A content page and an Appendix has been added segregating and mapping the content to the syllabus.

It is an appreciable efforts by Vedhik IAS Academy helping aspirants of UPSC Civil Services Examinations. I would like to express my sincere gratitude to Dr. Babu Sebastian, former VC - MG University in extending all support to this endeavour. Finally I also extend my thanks to thank Ms. Shilpa Sasidharan and Mr. Shahul Hameed for their assistance in the preparing the compilations.

We welcome your valuable comments so that further improvement may be made in the forthcoming material. We look forward to feedback, comments and suggestions on how to improve and add value for students. Every care has been taken to avoid typing errors and if any reader comes across any such error, the authors shall feel obliged if they are informed at their Email ID.

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The IPEF holds promise but there are perils too

The U.S. has been carefully constructing the framework and India, despite endorsing it, needs to be wary of hurdles



BISWAJIT DHAR

On May 23, the Joe Biden administration took a significant step to turn the clock back to the Obama Presidency by launching its own version of a “pivot to Asia” through the establishment of the Indo-Pacific Economic Framework for Prosperity (IPEF) with other partner countries – Australia, Brunei, India, Indonesia, Japan, the Republic of Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, Vietnam and the United States. Within days of its launch, IPEF expanded its membership to the Pacific Island states, with Fiji joining the initiative.

An American initiative to bring together its allies in the Indo-Pacific region to enhance economic cooperation is bound to lead to comparisons with one of former U.S. President Barack Obama’s pet projects, the Trans-Pacific Partnership (TPP), which was spiked by Donald Trump immediately after he took over the reins in Washington. The IPEF reignites the twin ambitions of the U.S. to provide economic leadership and to challenge China’s hegemony in the region.

A tag that fits

The U.S. Trade Administration had touted the TPP as “Made in America” (<https://bit.ly/3MT7KA6>), a tag that seems equally appropriate for the IPEF. At its launch, the IPEF was proposed as an elaborate framework of rules covering four pillars, namely, fair and resilient trade, supply chain resiliency, clean energy decarbonisation, and tax and anti-corruption. It is not clear whether the original signatories to the IPEF were fully in the know of the details that were unveiled at the launch of the initia-

tive, for there is no record of any prior discussion. However, evidence is available that suggests that Washington has been carefully constructing the framework ever since President Biden had first spoken about it in October 2021 during the East Asia Summit, in the presence of all IPEF signatories except Fiji.

Following its usual process of coalescing the views of all major business interests and the political establishment, the Biden administration sought public comments in March from “interested parties” on the four pillars to assist its trade administration for developing the U.S.’s position in IPEF negotiations. Not surprisingly, major corporations, including Google, Microsoft, IBM, Intel and Cargill and influential industry associations such as the Biotechnology Innovation Organization and the Pharmaceutical Research and Manufacturers of America (PhRMA) responded to the call. The IPEF was also discussed in considerable detail in the U.S. Congress, a process that is vitally important to secure bipartisan support for the Biden administration to conduct negotiations to translate the framework into reality.

On IPRs

The Biden administration has announced that under the “fair and resilient trade” pillar, it “aims to develop high-standard, worker-centered commitments” covering labour rights, the environment and climate, the digital economy, agriculture, transparency and good regulatory practices, competition policy and trade facilitation. The clear focus of this agenda is to focus on issues which the U.S. considers vital to further its interests. One notable exclusion from this list is intellectual property rights (IPRs) that have generally been at the heart of the U.S.’ economic engagements with its partner countries. One possible reason for excluding IPRs could be that these are seen as the major reason why only 16.2% of people in low-in-



come countries have received at least one dose of the COVID-19 vaccine until today. But with several corporations, including those from the pharmaceutical and electronics sectors, and members of the Congress making a strong pitch for their inclusion, IPRs could soon figure in the IPEF negotiations.

Promoting “fair and resilient trade” defines the U.S.’s agenda on trade, side-stepping its pursuit of the free trade ideal. The reason behind this shift could be that for most IPEF signatories, import tariffs are passé. Only four of the 14 signatories have average tariffs in double digits. The U.S. Secretary of Commerce, Gina M. Raimondo has, thus, affirmed that the IPEF is “intentionally designed not to be a same old... traditional trade agreement” (<https://bit.ly/3tIpOMd>). The primary objective of the IPEF is to ensure a high degree of regulatory coherence and to make market access contingent upon realisation of regulatory standards. It must be pointed out that standards and regulations in most developed countries often create discretionary/discriminatory barriers to trade and overcoming these barriers is usually beyond the capacities, both institutional and otherwise, of lesser developed countries.

Contentious issues

Two contentious issues that are generally included in free trade agreements (FTAs) involving the U.S., namely, labour rights and the

environment and climate change, are duly included in the IPEF. Enforcement of labour rights using trade rules is quite contentious, having been rejected by the members of the World Trade Organization (WTO) on several occasions. WTO members had arrived at a consensus that the “internationally recognized core labour standards” of the International Labour Organization (ILO) should be used to deal with issues pertaining to labour rights. They had also rejected the use of labour standards for protectionist purposes.

As regards the environment, the United Nations Framework Convention on Climate Change (UNFCCC) had cautioned that “measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade” (<https://bit.ly/3as4BZz>). The IPEF could threaten abrogation of these decisions at the WTO and the UNFCCC.

Data portability

A third set of issues, whose ramifications on the future of the digital economy and beyond can be far reaching, are those related to standards on cross-border data flows and data localisations. Control over data, the driver of the digital economy, will increasingly determine the dynamics of economies, and hence the issue of data portability assumes critical importance.

Although China was not mentioned at the official launch of the IPEF, possibly for diplomatic reasons, the second largest economy has been at the centre of Washington’s strategies for the Indo-Pacific, especially with regard to supply chains. However, the crux of the American narrative on this issue is the hope that U.S. manufacturing giants, most of which have made China their preferred production bases at least since the 1990s, would move to the other countries in the Indo-Pacific. But even if these corporations move to coun-

tries other than China, how can the U.S. ensure supply chain resilience?

What New Delhi has to watch

What could India expect from the IPEF? While endorsing the IPEF, Prime Minister Narendra Modi had spoken of India’s aspiration to participate more substantially in the supply chains in the region. However, this would have its challenges. For instance, while addressing the needs of the digital economy, the U.S. has emphasised the importance of “high-standard rules... on cross-border data flows and data localization” (<https://bit.ly/3xb0M2G>). On this issue of data localisation, the Government of India has not yet taken a clear position. In 2019, its likely preference was revealed in the Draft National e-Commerce Policy, wherein it had backed restrictions on cross-border data flows. The key challenge for India is to sustain this diametrically opposite view to an uncompromising position of the U.S. on data localisation.

India should also be wary of the considerable emphasis that is being given to strengthening labour rights in the on-going discussions on the IPEF, both by corporate interests and members of the Congress. In a Senate Finance Committee hearing in April, Elizabeth Warren, one of the more vocal voices among the Democrats extolled the United States Trade Representative, Katherine Tai, who would be leading the discussions on the “fair and resilient trade” for “incorporating strong, enforceable labor and environment standards to demonstrate [the U.S.’s] commitment to the importance of these areas in [the U.S.’s] competitiveness and in our terms of trade” (<https://bit.ly/3tcUMFp>). How would India’s preference for a “flexible labour market” gel with the regime that the U.S. is proposing for the IPEF?

Biswajit Dhar is Professor, Centre of Economic Studies and Planning, Jawaharlal Nehru University

HC remark on conversion ‘right’ raises questions

A 1977 SC verdict says Article 25 does not allow such a right

KRISHNADAS RAJAGOPAL
NEW DELHI

Recent observations by the Delhi High Court that religious conversion, unless forced, is not prohibited raise a question if proselytism is also protected under the right to religious freedom in the Constitution.

A few days ago, the High Court, hearing a petition by advocate Ashwini Upadhyay to frame laws to prohibit conversions by force or deception, observed that “first and foremost, conversion is not prohibited. It is a right of an individual to profess any religion, religion of his birth, or religion that he chooses to profess. That is the freedom our Constitution grants”.

Article 25(1) of the Constitution says that “subject to public order, morality and health... all persons are equally entitled to freedom of conscience and the right to freely profess, practise and propagate religion”.

Though a person has a right to “profess” or affirm his allegiance to a religion, does Article 25 extend the



A petition in the Delhi HC has alleged mass conversions.

right to “propagate” one’s religion to converting another to one’s faith?

In the HC, Mr. Upadhyay had reportedly alleged “mass conversions” of underprivileged people, particularly the Scheduled Castes and the Scheduled Tribes.

In its 1977 judgment, a five-judge Bench of the Supreme Court, in *Rev. Stainislaus versus State of Madhya Pradesh*, had held that the word ‘propagate’ in Article 25 does not give “the right to convert another person to one’s own religion, but to spread one’s religion by an exposition of its tenets”.

The Constitution Bench had also held there was “no fundamental right to convert another person to one’s own religion”. “If a person purposely undertakes conversion of another... as distinguished from his effort to transmit or spread the tenets of his religion, that would impinge on the ‘freedom of conscience’ guaranteed to all the citizens of the country alike,” the 1977 verdict said.

But Supreme Court advocate Kaleeswaram Raj said the 1977 judgment remains “incomplete”.

“Even though the right to propagate religion does not include the right to convert, one’s fundamental right under Article 25 to freely profess or practise religion will include the right to get converted. The *Stainislaus* judgment only dealt with the right to propagate or convert, and not the right to get converted. The Delhi High Court’s view is more on the right to get converted. It is an area the Constitution Bench did not go deeper into,” Mr. Raj said.

Boost for boosters

With the approval of Corbevax as a booster dose, India will have a heterologous shot

With the Indian drug regulator greenlighting Corbevax as a booster dose for all adults above 18 years who have received two doses of either Covishield or Covaxin as part of primary vaccination, a heterologous booster shot has come a step closer to being administered to people. Though booster shots have been administered since January 10 beginning with health-care and frontline workers, and people over 60 with comorbidities, India has been using the same vaccine for both primary vaccination and booster (homologous boosting). In clinical trials, a booster dose using a vaccine that is different from the one used for primary vaccination – technically called heterologous boosting – produced higher immune responses when compared with a same vaccine for primary and booster vaccination. A trial by the Christian Medical College, Vellore, too found the same result. As expected, Bio E's phase-3 heterologous booster vaccine trial using Corbevax in people who have received two doses of either Covaxin or Covishield did produce significantly higher immune responses. But with the control group not receiving a homologous booster shot but only a placebo, the trial failed to bring out the enhanced immune responses by using Corbevax as a heterologous booster. Any vaccine administered as a booster – immaterial of being homologous or heterologous – months after primary vaccination will, by default, increase the immune responses. The trial has thus only shown that Corbevax as a heterologous booster increases the immune responses but failed to show that heterologous boosting with this vaccine produces superior immune responses than homologous boosting with Covishield or Covaxin. It is all the more surprising that the booster trial used a placebo for the control arm as even the phase-3 clinical trial to study the immunogenicity of Corbevax for primary vaccination used the comparator vaccine Covishield for the control group.

With Corbevax being approved as a heterologous booster based on a poorly designed heterologous booster trial, the drug regulator can be expected to soon greenlight Covishield and Covaxin as heterologous boosters based on the results of the CMC Vellore trial. Especially as the trial clearly demonstrated the advantages of heterologous boosting compared with using the same vaccine for primary vaccination and boosting. While the National Technical Advisory Group on Immunisation (NTAGI) is quite likely to approve Corbevax as a heterologous booster shot without much delay, it remains to be seen whether it greenlights it for all adults above 18 years. Given the greater likelihood of NTAGI approving Corbevax as a heterologous booster, the Government is not likely to side step the expert group, as in mid-March. As booster shots have been rolled out for all adults above 18 years, the Government should not hurry to approve Corbevax without NTAGI's nod.

Modinomics and the long distance to the finish line

The Indian economy needs a new economic policy that has clear objectives unlike the incoherent announcements now



SUBRAMANIAN SWAMY

On May 31, 2022, in its press note on provisional estimates on national income, the National Statistical Office (NSO) released the 2021-22 fourth quarter GDP growth rate figure at 4.1% (April 1-March 31, 2022 in annual equivalent terms) compared to fourth quarter figures for the previous year, 2020-21.

In the first quarter of 2020-21 (April 1 to June 30), GDP growth rate according to the NSO, was -23.8%, which is when the COVID-19 pandemic began spreading.

The combined subsequent and remaining three quarters of 2021-22 annualised growth rate was negative, and thus for the fiscal year of four quarters, the GDP annual 2020-21 was placed at -4.8%.

Points to note

The following two conclusions are important to the Narendra Modi government for a badly needed reality check. First, which I have detailed in my earlier Opinion articles in *The Hindu* is that the Indian economy had been declining in growth rate since 2016 and fell below what was earlier sneeringly referred to by economists in the Congress-ruled period (1950-77) as “The Hindu Rate of Growth” of 3.5%-4% per year growth rate in GDP.

Second, the Modi government

should recognise that during the present Prime Minister’s tenure since 2014, his plan for “Vikas” is more genuinely akin to the Hindu rate of growth planning of Jawaharlal Nehru. No P.V. Narasimha Rao tenure type structural reforms were systematically implemented. The decline in GDP growth rate from 2016 till today is thus a national shame for a dispensation that claims to bring “Vikas” to the country.

Not only has the growth rate of GDP been consistently declining since 2016 but the brazen but rosy predictions that were impossible to achieve without major reforms, such as a \$5 trillion GDP by 2024-25, have been publicised in the media, (which in 2019, when Mr. Modi announced the goal, meant a 14.8% per year growth rate in GDP).

I am prepared to debate publicly with any Government official to prove to the Indian public that “Modinomics” to date is a gigantic failure. That is, to prove that no announced macroeconomic goal has been achieved during the Modi tenure as Prime Minister so far from 2014 till date.

What is needed

What the Indian economy needs today is a new economic policy that is based on clearly stated objective targets, priorities, a strategy to achieve the targets, and an intelligent and transparent resource mobilisation plan. At present we have an incoherent hotch-potch set of public announcements, with no accountability or logic.

The Atal Bihari Vajpayee government lost badly in 2004 des-



GETTY IMAGES/ISTOCKPHOTO

pite the confidence in advancing the general election by six months before the due date because of the imaginary paradise of “India Shining”. The Bharatiya Janata Party (BJP) could not make an electoral comeback for 10 years after the debacle in the 2004 elections.

The BJP was lucky to come back in 2014 because of the Supreme Court judgments cancelling the 2G Spectrum licences, hopes of Ram Mandir re-building, and a failing economy.

Democracy’s dynamics

Today, the BJP is in its eighth year of its tenure as the ruling party. Although some socio-religious successes have helped to raise the morale of party workers, the 2024 general election is still not a done deal. State elections in West Bengal and Punjab are also not good omens. In the recent elections in Uttar Pradesh, the margins of victory were mostly very narrow. My own reading is that economic failure, which is fast becoming the main issue, could drastically unsettle even the most conservative forecast in 2024. Democracy could be threatened by desperate political extremists.

In every nation, democracy is

structured on four pillars: electoral legitimacy, constitutional safeguards, functionally independent institutions, and embedded accountability. Mere elections are not sufficient for a democracy.

But there is a conflict between the market and democracy that requires to be resolved: a flourishing and vibrant democracy that empowers a relatively poor uncorrupted majority to vote, and hence can influence legislation against the relatively rich capitalist and entrepreneurial minority, and a thriving market economy driven by a rich empowered minority with disproportionate access to capital, skills and media and other networks has the capacity to undermine the electoral system through strategic funding of the same.

Therefore, there is a need to understand the dynamics of democracy especially since, in India, even economic reformers such as Narasimha Rao have so far lost elections.

Thus, designing reforms is most important because leaders initiating reforms must win elections. Let us understand how a democratic Japan came to have such an opaque financial system with no prudential norms or accountability because of cronyism that had to be pleased, or how the United States that had no proper regulation in place for the new sophisticated financial products gave free play to so much greed that it led to the global financial crisis in 2007-09.

Economic reforms in a democracy can be electorally successful if so designed that the losers from it (usually touts who organise quo-

tas and licences for the rich for a price, and who, because de-regulations implicit in reforms make them immediately lose the “rent”) do not hijack the election, while the unorganised poor who cannot see early returns from reforms are kept satisfied by reducing unemployment and controlling galloping inflation.

Deregulations should also not mean that we reject government intervention for safety nets, affirmative action, market failure and creating a level-playing field.

Empower institutions

Democratic institutions have to be empowered to guard against public disorder arising from rapid de-regulation, as it happened in Russia, post-1991. The Russians underwent chaos and misery. Thus, dictatorship has returned for the Russians.

Thus, the trade-offs as between public order and de-regulation, through affirmative action, social security and a safety net, are essential to create a stake for the poor in the system, levelling the playing field to create hope, ensure transparency, accountability, and trusteeship (philanthropy) as also corporate governance to legitimise profit making that drives the market system.

Market systems are not a free-for-all. It is capitalism with rules of transactions. With that proviso, market system capitalism works since the principal driver is capital and its deployment for innovation to raise productivity.

Subramanian Swamy is a former Union Minister and a six-term Member of Parliament

EXPLAINER

The status of eVTOL: a soon to be reality?

What powers electric vertical take off and landing aircraft? What new regulations and policy changes does India need to better integrate electric vertical aircraft?

THE GIST

■ The Government of India is exploring the possibility of inviting manufacturers of Electric Vertical Take off and Landing (eVTOL) aircraft to set up base in India. Aviation Minister Jyotiraditya Scindia has been reported as asking Beta Technologies, which has a partnership with the Blade group (it has a presence in India), to look at the Indian market.

■ An eVTOL aircraft is one that uses electric power to hover, take off, and land vertically. This is technology that has grown on account of successes in electric propulsion based on progress in motor, battery, fuel cell and electronic controller technologies and also fuelled by the need for new vehicle technology that ensures urban air mobility (UAM).

■ The global market for eVTOLs was put at \$8.5 million in 2021 and is to grow to \$30.8 million by 2030. The demand will be on account of green energy and noise-free aircraft, cargo carrying concepts and the need for new modes of transport.

MURALI N. KRISHNASWAMY

The story so far: The Union Civil Aviation Minister, Jyotiraditya Scindia, has said that the Government of India is exploring the possibility of inviting manufacturers of Electric Vertical Take off and Landing (eVTOL) aircraft to set up base in India. The Minister had been on a visit to the U.S. and Canada in April and in his interactions with key players in the industry, it was said that several eVTOL players were 'keen on setting up production centres' in the country. In late May, while speaking at "India@2047", which was part of the seventh edition of the India Ideas Conclave in Bengaluru, the Minister also said that India is in 'conversation' with a number of eVTOL producers – the implication being a futuristic vision for India.

What is eVTOL?

As the acronym suggests, an electric vertical take-off and landing (eVTOL) aircraft is one that uses electric power to hover, take off, and land vertically. Most eVTOLs also use what is called as distributed electric propulsion technology which means integrating a complex propulsion system with the airframe. There are multiple motors for various functions; to increase efficiency; and to also ensure safety. This is technology that has grown on account of successes in electric propulsion based on progress in motor, battery, fuel cell and electronic controller technologies and also fuelled by the need for new vehicle technology that ensures urban air mobility (UAM). Thus, eVTOL is one of the newer technologies and developments in the aerospace industry.

An article in *Inside Unmanned Systems*, a leading business intelligence platform, describes eVTOL as being "a runway independent technological solution" for the globe's transportation needs. This is because it opens up new possibilities which aircraft with engines cannot carry out in areas such as manoeuvrability, efficiency and even from the environmental point of view. The article adds that there are an estimated 250 eVTOL concepts or more being fine-tuned to bring alive the concept of UAM. Some of these include the use of multi-rotors, fixed-wing and tilt-wing concepts backed by sensors, cameras and even radar. The key word here is "autonomous connectivity". Some of these are in various test phases. There are also others undergoing test flights so as to be certified for use. In short, eVTOLs have been likened to "a third wave in an aerial revolution"; the first being the advent of commercial flying, and the second, the age of helicopters.

Why are the developments in powering eVTOLs?

An article in *Avionics International* says the roles eVTOLs adopt depends on battery technology and the limits of onboard electric power. Power is required during the key phases of flight such as take off, landing and flight (especially in high wind conditions). There is also the important factor of weight. BAE Systems, for example, is looking at formats using a variety of Lithium batteries. Nano Diamond Batteries is looking at "Diamond Nuclear Voltaic (DNV) technology" using minute amounts of carbon-14 nuclear waste encased in layered industrial diamonds to create self-charging batteries. There are some industry experts who are questioning the use of only batteries and are looking at hybrid technologies such as hydrogen cells and batteries depending on the flight mission. There is even one that uses a gas-powered generator that powers a small aircraft engine, in turn charging the battery system. But whatever the technology, there will be very stringent checks and certification requirements.

What are the challenges?

As the technology so far is a mix of unpowered and piloted aircraft, the areas in focus include "crash prevention systems". These use cameras, radar, GPS (global positioning

system) and infrared scanners. There are also issues such as ensuring safety in case of powerplant or rotor failure. Aircraft protection from cyberattacks is another area of focus.

A third area is in navigation and flight safety and the use of technology when operating in difficult terrain, unsafe operating environments and also bad weather.

How did it begin?

There is general agreement that the eVTOL world is moving forward based on the spark provided by NASA researcher Mark D. Moore who came up with the concept of a personal (one man) air vehicle while working towards his doctorate. Called the "Puffin" and thought of in 2009-10, it was about four metres tall and with a wingspan of 4.4 metres. It had 60hp electric motors that powered two propellers. Its other specifications included a four-point landing gear, a weight of 272kg, 45kg of batteries, a pilot payload of about 90kg, fetching it a total weight of 407 kg. Its top speed was under 245 kmph with a range of about 80km. A prototype was unveiled in 2010 and the concept was discussed at a conference on aeromechanics in 2010, according to an article in *Electric VTOL News*. In his paper, "NASA Puffin Electric Tail-sitter VTOL Concept", Moore described "electric propulsion as offering dramatic new vehicle mission capabilities, ... but the only penalising characteristic" being "the current energy storage technology level".

Are there any big players now?

Since then there have been a number of ideas by industry, such as the Volocopter VCI from Germany and the Opener BladeFly from the U.S. The top aircraft manufacturers, Airbus and Boeing, have also joined the race. Airbus unveiled its prototype, Vahana Alpha One or the Airbus Vahana (from the Sanskrit Vahana), at the Paris Air Show in 2017. It was pitched as a "cost-comparable replacement for short-range urban transportation" based on a fan-run tilt-wing design. Prototypes made test flights. Airbus then shifted to the "CityAirbus" project (air taxi) which has propellers and direct-drive electric motors.

Boeing is working on the Boeing Passenger Air Vehicle, as an "American autonomous personal air vehicle prototype". However, the major disruptors have been start-ups, backed by huge dollar flow.

A company, Lilium, started in 2015, which claims to be the "developer of the first all-electric vertical take-off and landing eVTOL jet", says that it is moving towards developing prototypes "designed to extract over 100kW of power from a system weighing just over 4kg" – which gives us an idea of the advancements. Its LiliumJet theory has been designed for concepts such as private flights, six-seater passenger flights, or no seating for the zero-emissions logistics market.

It says that the concept looks to connect towns and cities (40km-200km) at speeds of up to 300km/h. It has called this as aimed at Regional Air Mobility, which it clarifies is not to be confused with Urban Air Mobility (UAM) – connecting intra-city points over shorter distances, or less than 20 km. It is also working on a seven-seater model, for use in existing helipads; In the U.S., for example, this would mean approximately 14,000 possible locations. The power demand across different phases of flight and the predicted range have been discussed in detail in a technology paper.

China, Israel and the U.K too have programmes to look out for.

How does one get an idea of the kinds of eVTOLs?

Electric VTOL News, for instance, has a World eVTOL Aircraft Directory. Started in 2016 and listing half-a-dozen known designs, it has now progressed to categorising almost all known electric and hybrid-eVTOL concepts. Categories are: "Vectored Thrust",

where any thruster is used for lift and cruise; "Hover Bikes/Personal Flying Devices", which are single-person eVTOL aircraft and in multicopter-type wingless configurations; "Lift and Cruise", where independent thrusters are used for cruise and lift without any thrust vectoring; "Wingless (Multicopter)", or where there is no thruster for cruise but only for lift; and "Electric Rotorcraft" or eVTOLs that use a rotor, such as an electric helicopter or autogyro.

What about certification?

Some companies have concepts that are aimed at dual certifications by regulatory agencies in the western world. In March this year, the Federal Aviation Administration (FAA) and the United Kingdom Civil Aviation Authority announced being engaged in discussions focused on "facilitating certification and validating new eVTOL aircraft, their production, continued airworthiness, operations, and personnel licensing". Both bodies also highlighted the need to maintain very high safety standards. Further to this, eVTOL technology is to use existing regulatory frameworks despite being in the form of new and emerging technologies. The FAA has clarified that it plans to certify eVTOLs as powered-lift aircraft (an existing category) but in future, "develop additional powered-lift regulations" for innovation in operations and pilot training. It plans to use a "special class" process in 14 CFR 21.17(b) to oversee the unique features of emerging powered-lift models. But this certification will use the performance-based airworthiness standards found in Part 23 of the FAA regulations. The FAA's important clarification that the changes will be gradual has been welcomed by eVTOL developers, who are leaning on the Part 23 framework as the bedrock for type certification.

An article in *Inside Unmanned Systems*, a leading business intelligence platform, describes eVTOL as being "a runway independent technological solution" for the globe's transportation needs.

eVTOL certification is also complex because of planned operations within urban areas, new battery systems and the need for higher levels of automated redundancy.

How has the progress been?

The Paris summer Olympics 2024 is expected to be the big moment, according to an article in *Bloomberg*. France is working on two dedicated routes to transport passengers. Landing and takeoff zones at the Pontoise-Cormeilles-en-Vexin hub are being tested on parameters such as noise levels, integration of drones and eVTOLs with existing air traffic, battery charging and also maintenance.

How will it be in India?

Mr. Scindia has been reported as asking Beta Technologies, which has a partnership with the Blade group (it has a presence in India), to look at the Indian market. An official from Blade India told *The Hindu* that Blade is an urban air mobility company that aims to connect places that are heavily congested and also not well connected by air services. The concept of 'Advanced Air Mobility' comes in, i.e., connecting places through vertical aircraft and thus skipping road travel. This is being done now by helicopters, but eVTOLs will step into this space. The official said that Blade U.S. is currently working with electric vertical aircraft (EVA) manufacturers such as Beta Technologies and has partnered with them for an all electric fleet by the year 2024. eVTOLs are noise free, have a zero carbon footprint and are more affordable. Beta technologies and other EVA manufacturers have been extended an invitation to manufacture in India.

Amrit Dutta, Managing Director, Blade

What are electric aircraft?

The Union Aviation Minister while speaking at the seventh edition of the India Ideas Conclave in Bengaluru, stated that India is in 'conversation' with a number of eVTOL producers. But how are Electric Vertical Take off and Landing aircraft structured? And what are they capable of?

Vertical Aerospace VA-X4
*Electric Vertical Take Off and Landing

Propulsion: Eight Rolls-Royce electric motors

Take-off and landing: Rear vertical rotors fan out, front propellers orientate vertically

Stowed: Front propellers fold into stowed position. Undercarriage withdraws. Front propellers tilt for forward motion

Flight: Rear rotors fold into stowed position. Undercarriage withdraws. Front propellers tilt for forward motion

Other components: Pilot and four passengers, Luggage hold, V-tail with rudders, Front rotors, Rear vertical rotors

Cruise speed:	241km/h
Range:	161km
Payload:	450 kg
Wing span:	15m
Length:	13m
Height:	4m

Sources: Vertical Aerospace, Future Flight, Business Wire Picture: Vertical © GRAPHIC NEWS

India is the chairperson of the Confederation of Indian Industry (CII) Taskforce for Urban Air Mobility. In his suggestions for policy and regulation changes to better integrate EVAs, he has advised regulatory authorities in India to look at: formulating regulations for pilotless vehicles, airworthiness certifications, and the need for a pilot's licence; implementing efficient energy management systems, onboard sensors, collision detection systems and advanced technologies such as artificial intelligence; having in place infrastructural support such as take-off and landing zones, parking lots, charging stations and what are called vertiports; creating a robust air traffic management system that is integrated with other modes of transportation, and putting in place a database to ensure operational and mechanical safety.

In addition to this, there are psychological barriers that need to be overcome when it comes to flying in a fully autonomous aircraft. Therefore, the official added, there needs to be a document that outlines compliance for eVTOLs and also aligns frameworks to meet the standards adopted in commercial aviation, especially when it comes to safety. The current timeline for certification with India's Directorate General of Civil Aviation is two years. The Blade India official says that there is a need for a committee to spell out the guidelines for eVTOL operations and speed up the process.

What is the value of the market?

The global market for eVTOLs was put at \$8.5 million in 2021 and is to grow to \$30.8 million by 2030. The demand will be on account of green energy and noise-free aircraft, cargo carrying concepts and the need for new modes of transport.

According to the Blade India official, the UAM market is expected to expand at a compound annual growth rate of 25% between 2018-25. By 2025, it is anticipated to be a \$74 billion market. This includes the eVTOLs market since UAM ideally focuses on the use of eVTOLs, the official added.

'Never again will there be coal shortage'

The demand for power went up due to improved economic activity, says Union Coal Minister

M. RAMESH

Twice in the recent past the country has faced coal shortage – in October 2021 and last month. While critics blame poor planning, the government says it was an “extraordinary situation”, and action has been taken to ensure that a shortage never occurs again. Excerpts from an interview with Union Coal Minister Pralhad Joshi at Neyveli, Tamil Nadu, where he had come to review the performance of the public sector company, NLC India Ltd.:

You have been repeatedly saying that there is no coal shortage in the country. Yet Coal India Ltd. is taking steps to import coal. If there is no coal shortage, why go in for imports? How should we read the situation?

■ Even today, I am saying there is no shortage of coal. As of now, we are having 11-12 days stock of coal (required by power plants), on average, as a country. We have about 33.6 million tonnes of coal (lying in various places). Pithead power plants have about 25 days of stock, those about 300 km (from the mines) have about 20 days' stock, those beyond 500 km may be having 14-15 days' stock – like that.

In the last few days, there has been no depletion of stocks. We are replenishing

coal stocks with power plants on a day-to-day basis. There was a shortage of coal due to an extraordinary situation. The demand for power went up due to improved economic activity, but at the same time power plants operating on imported gas and coal stopped producing power because of high gas and coal prices. Coal prices increased from \$40 a tonne to \$210 a tonne. Also, power plants operating with blended coal (partly imported) stopped importing and began demanding domestic coal.

Last year, domestic coal production increased by 18%. In the first two months of the current financial year, production from captive mines alone increased by 70%.

Now, coming to why we are importing – it is because of the upcoming rainy season, when mines could be waterlogged and not be able to produce coal. Also, rain could affect transportation of coal. Keeping this in mind, we want to import and keep some stocks so that the country does not suffer.

Some people have expressed fears of a 'third round' of shortage. You don't expect that to happen?

■ There won't be any coal shortage. You see, Coal India Ltd. will ramp up its production to 780 million tonnes



We have to show that we will use coal without harming the environment

this year. Captive mines produced 89 million tonnes (mt) last year; this year they expect to produce 130 mt. I am expecting 5 mt from commercial coal mining and another 5 mt from abandoned coal mines. All put together, coal production will increase by 100 mt. In contrast, the shortage was not even 10 mt. Still we are planning for any eventuality by imports. We will import whatever is needed.

So, are you confident that coal shortage is a thing of the past?

■ I'm fully confident. I want to assure the country that there will never be a coal shortage again.

You have also been saying repeatedly that the country cannot do without coal. On the other hand, India has

global commitments to reduce carbon dioxide emissions. How do you handle this dichotomy?

■ We would definitely need coal for at least for a long time. Without coal, we cannot fulfil the aspirations of the country. The question is, how to use coal in a manner that doesn't affect the environment or contribute to global warming. We have to do all that we can to ensure that usage of coal does not cause any harm.

There are many ways of doing it, such as coal gasification and planting trees.

We are going in for coal gasification of high ash coal. Coal gasification is covered by the PLI scheme (production-linked incentive scheme, which gives a financial incentive for every unit of production that is sold.)

We are going in for four pilot plants for coal gasification, with imported technology.

But coal gasification plants typically suffer huge delays.

For example, the Talcher project.

■ That is why we want to invite private players and also international players. Even the Talcher project is being expedited. Necessary steps are being taken.

There are many reports saying that coal power will not be competitive in future. Do you foresee any problems in coal mines getting finance?

■ There is no problem, they are already getting finance. We have sold 47 mines –

But only about 15 of them have started work

■ You see, it takes time to develop any mine. About 4-5 years. There are 21 permissions or clearances to be obtained.

But the question is, how do the financiers see the coal sector. Many international funds, such as the Norwegian sovereign fund, have said they would stop funding fossil fuels.

■ Many countries that had earlier said they would not burn coal are now turning back to coal.

Only, we have to show that we will use coal without harming the environment.

(M. Ramesh is a Special Correspondent with The Hindu Business Line)

10% ethanol blending goal met, says PM

SPECIAL CORRESPONDENT

NEW DELHI

India has achieved the target of 10% ethanol blending in petrol, five months ahead of schedule, Prime Minister Narendra Modi said on Sunday.

This, he claimed, had led to a reduction of 27 lakh tonnes of carbon emissions and saved foreign exchange worth ₹41,000 crore. Farmers earned ₹40,600 crore in the past eight years due to increase in ethanol blending, Mr. Modi said at an event organised by the Isha Foundation.

Last June, Mr. Modi made public the “Road map for ethanol blending in India, 2020-25”, which laid out a pathway for achieving 20% ethanol blending by 2025-26.

The 10% blending target was to be achieved in November 2022.

China marks new space milestone

Astronauts dock at Tiangong space station which will be operational by 2022-end

AGENCE FRANCE-PRESSE

BEIJING

Three Chinese astronauts docked at the country's space station on Sunday, the state broadcaster said, marking a new milestone in Beijing's drive to become a major space power.

The trio blasted off in a Long March-2F rocket at 0814 GMT from the Jiuquan launch centre in northwestern China's Gobi desert, said broadcaster CCTV.

The team is tasked with "completing in-orbit assembly and construction of the space station", as well as "commissioning of equipment" and conducting scientific experiments, state-run CGTN said on Saturday.

The spacecraft docked at



Giant stride: The rocket carrying Shenzhou 14 spacecraft blasts off from the launch centre in Jiuquan on Sunday. ■ AP

the Tiangong station after about "seven hours of flight", CCTV reported.

Fully operational

Tiangong, which means "heavenly palace", is expected to become fully opera-

tional by the end of the year.

China's heavily promoted space programme has already seen the nation land a rover on Mars and send probes to the Moon.

The Shenzhou-14 crew is led by Air Force pilot Chen

Dong, 43. The three-person crew's main challenge will be connecting the station's two lab modules to the main body.

Tiangong's second crew

Mr. Dong, along with fellow pilots Liu Yang and Cai Xuzhe, will become the second crew to spend six months aboard the Tiangong after the last returned to earth in April following 183 days on the space station.

Tiangong's core module entered orbit earlier last year and is expected to operate for at least a decade.

The completed station will be similar to the Soviet Mir station that orbited Earth from the 1980s until 2001.

World's first fishing cat census done in Chilika

The lake has 176 of the globally threatened species

SATYASUNDAR BARIK
BHUBANESWAR

The Chilika Lake, Asia's largest brackish water lagoon, has 176 fishing cats, according to a census done by the Chilika Development Authority (CDA) in collaboration with the Fishing Cat Project (TFCP).

This is the world's first population estimation of the fishing cat done outside the protected area network.

According to the CDA, phase 1 of the estimation was conducted in 2021 in the 115 sq.km marshland in the north and north-eastern section of Chilika and its surrounding areas. Phase 2 was conducted in 2022 in

the Parikud side along the coastal islands of Chilika.

A total of 150 camera traps were deployed in two phases with each fixed in the field for 30 days. Spatially explicit capture recapture method was used to analyse the data, the CDA said in a statement.

'Participatory spirit'

"It was truly participatory in spirit since local fishermen and villagers of Chilika were the primary participants in this exercise. Without their support, the world's first such population estimation outside protected areas on this globally threatened cat, would not have been possible," said Susanta Nanda, Chief Executive Officer, CDA.

"Ten graduate and postgraduate students also



In two phases, 150 camera traps were deployed.

volunteered during the exercise. Chilika Wildlife Division staff actively facilitated and participated in the estimation. Such a participatory effort involving multiple stakeholders for studying this elusive and threatened species sets a wonderful precedent," said Partha Dey, co-founder, TFCP.

The CDA said the globally threatened cats are found in wetlands in major South and

Southeast Asian river basins starting from the Indus in Pakistan till the Mekong in Vietnam and in Sri Lanka and Java. They are found in 10 Asian countries but have stayed undetected in Vietnam and Java since the last decade or so.

"Wetlands in Asia are being lost at alarmingly rapid rates and proper data on their current status or even baseline data are missing. The status of many wetland species remains understudied and highly threatened. Tracking specialist species such as the fishing cat gives us an indication of what might be happening to these ecosystems, which are safeguards against climate change and droughts," said Tiasa Adhya, the co-founder of TFCP.

Rivers facing heavy pollution: CSE

Heavy toxic metals such as lead, iron, nickel present at alarming levels, says NGO

JACOB KOSHY
NEW DELHI

Three of every four river monitoring stations in India posted alarming levels of heavy toxic metals such as lead, iron, nickel, cadmium, arsenic, chromium and copper.

In about a fourth of the stations, which are spread across 117 rivers and tributaries, high levels of two or more toxic metals were reported.

Of the 33 monitoring stations in the Ganga, 10 had high levels of contaminants. The river, which is the focus of the Centre's Namami Gange mission, has high levels of lead, iron, nickel, cadmium and arsenic, according to the State of Environment Report, 2022 from the environmental NGO, the Centre for Science and Environment (CSE).

The report is an annual compendium of environment-development data and is derived from public sources.

India has 764 river quality monitoring stations across



High pollution: Of the 33 monitoring stations on the Ganga, 10 had high levels of contaminants. ■ R.V. MOORTHY

28 States. Of these, the Central Water Commission tested water samples from 688 stations for heavy metals between August 2018 and December 2020.

Of the 588 water quality stations monitored for pollution, total coliform and biochemical oxygen demand was high in 239 and 88 stations across 21 States – an indicator of poor wastewater treatment from industry, agriculture and domestic households.

India dumps 72% of its sewage without treatment. Ten States do not treat their

sewage at all, as per the Central Pollution Control Board.

Coastline erosion

Over a third of India's coastline that is spread across 6,907 km saw some degree of erosion between 1990 and 2018. West Bengal is the worst hit with over 60% of its shoreline under erosion.

The reasons for coastal erosion include increase in frequency of cyclones and sea level rise and activities such as construction of harbours, beach mining and building of dams.

While the global average

of the Ocean Health Index, a measure that looks at how sustainably humans are exploiting ocean resources, has improved between 2012 and 2021, India's score in the index has declined over the same period, the CSE report underlines. India's total forest cover has registered a little over a 0.5% increase between 2017 and 2021 though most of the increase has taken place in the open forest category, which includes commercial plantations. This has happened at the cost of moderately dense forest, which is normally the area closest to human habitations. At the same time, very dense forests, which absorb maximum carbon dioxide from the atmosphere, occupy just 3% of total forest cover.

India has a forest cover of 77.53 million hectares. But recorded forests – the area under the forest department – are only 51.66 million. This gap of 25.87 million hectares – a size bigger than U.P. – remains unaccounted, the organisation noted.

Project to track small fishing vessels pending since 26/11

Despite trials being conducted, efforts to install the satellite-based Vehicle Monitoring System remain stuck, say officials

DINAKAR PERI
NEW DELHI

As the Quad grouping looks to track and address illegal, unreported and unregulated (IUU) fishing in the Indo-Pacific, an ambitious effort to install the satellite-based Vehicle Monitoring System (VMS) for small fishing vessels (less than 20 metres) across the country's coastline is still to be rolled out. Despite pilot studies being conducted, the project, conceived in the aftermath of the 26/11 Mumbai attacks, remains stuck, government officials say.

"Tracking of our small fishing vessels is something pending since 26/11, but it has been stuck primarily due to two reasons," an official said on condition of anonymity. "Fishermen don't want to get tagged as they do not want any of their illegal activities recorded and they are sceptical that others will get to know of where there is

good catch. Second is that fishing is a State subject and there are local politics involved," the official said.

The official further stated that there is no legislation to force fishermen to install the transponders and efforts by the Ministry of Fisheries to table the Indian Marine Fisheries Bill, 2021 which covers this has repeatedly been delayed due to the opposition from the States and fishermen.

Quad initiative

The Quad grouping, comprising India, Australia, Japan and the U.S., announced at the Tokyo summit last month an ambitious Indo-Pacific Maritime Domain Awareness (IPMDA) initiative to track "dark shipping" and to build a "faster, wider, and more accurate maritime picture of near-real-time activities in partners' waters" integrating three critical regions

in the Indo-Pacific – the Pacific Islands, Southeast Asia, and Indian Ocean Region (IOR).

There are two main regulations globally on IUU fishing – the Cape Town Agreement (CTA) and the Agreement on Ports State Measures (PSMA) – and India is, so far, not a signatory to both agreements.

The Automatic Identification System (AIS) is for bigger ships, which was made compulsory for all vessels above 20 metres after 26/11 by the National Committee on Strengthening Maritime and Coastal Security (NCSMCS).

For smaller fishing vessels, VMS, which is slightly different from AIS, is used, another official said, explaining that AIS is a broadcast mode which anyone can receive while VMS is a proprietary system and one can't receive unless the data is given. In terms of functioning VMS



Under watch: The monitoring system will help in tracking illegal and unregulated fishing, said officials.

has a transponder which relays data via a satellite.

Trials were conducted on tracking of vessels under 20 m first fitted on small patrol boats in Mumbai followed by trials on fishing vessels both of which were successful, the official said. "Further a pilot was carried out on a small number of fishing vessels along the coasts of Gujarat and Tamil Nadu."

The trials were conducted

in association with the Indian Space Research Organisation (ISRO) on one of their communication satellites and the transponders have advanced features like weather alert and so on but there has been no progress, the official further explained.

"Trials were again conducted in 2021 in collaboration with a start-up which were also successful. But

there has been no movement since." World over fishing vessels are supposed to have VMS which does not only give the position identity, the fishing vessel is also supposed to feed in the volume of the catch and where was it caught which tackles the issue of IUU.

Growing concern on IUU

There has been growing concern and action on IUU fishing that depletes fish stocks, destroys marine habitats, puts fishermen at disadvantage and impacts coastal communities, especially in developing countries.

In addition, there is also the issue of subsidies for fishermen. It is believed that more the subsidies given, more the illegal fishing, and there has been a campaign across the world against subsidies. India has been under pressure over this, two officials independently noted.

General Studies Paper I

A	History of Indian culture will cover the salient aspects of art forms, literature and architecture from ancient to modern times;
B	Modern Indian history from about the middle of the eighteenth century until the present-significant events, personalities, issues;
C	Freedom struggle-its various stages and important contributors / contributions from different parts of the country;
D	Post-independence consolidation and reorganization within the country;
E	History of the world will include events from 18 th century such as industrial revolution, world wars, re-drawing of national boundaries, colonization, decolonization,
F	Political philosophies like communism, capitalism, socialism etc.-their forms and effect on the society
G	Salient features of Indian Society, Diversity of India;
H	Effects of globalization on Indian society;
I	Role of women and women's organization;
J	Social empowerment, communalism, regionalism & secularism
K	Salient features of world's physical geography;
L	Geographical features and their location- changes in critical geographical features (including water bodies and ice-caps) and in flora and fauna and the effects of such changes;
M	Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc.
N	Distribution of key natural resources across the world (including South Asia and the Indian subcontinent);
O	Factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India);
P	Population and associated issues;
Q	Urbanization, their problems and their remedies

General Studies Paper II

A	India and its neighbourhood- relations;
B	Important International institutions, agencies and fora- their structure, mandate;
C	Effect of policies and politics of developed and developing countries on India's interests;
D	Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.
E	Indian Constitution, historical underpinnings, evolution, features, amendments, significant provisions and basic structure;
F	Comparison of the Indian Constitutional scheme with other countries;
G	Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein; Inclusive growth and issues arising from it;
H	Parliament and State Legislatures - structure, functioning, conduct of business, powers & privileges and issues arising out of these;
I	Structure, organization and functioning of the executive and the judiciary, Ministries and Departments;

J	Separation of powers between various organs dispute redressal mechanisms and institutions;
K	Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional bodies;
L	Statutory, regulatory and various quasi-judicial bodies;
M	Mechanisms, laws, institutions and bodies constituted for the protection and betterment of these vulnerable sections;
N	Salient features of the Representation of People's Act;
O	Important aspects of governance, transparency and accountability, e-governance- applications, models, successes, limitations, and potential;
P	Citizens charters, transparency & accountability and institutional and other measures;
Q	Issues relating to poverty and hunger,
R	Welfare schemes for vulnerable sections of the population by the Centre and States, Performance of these schemes;
S	Issues relating to development and management of social sector / services relating to education and human resources;
T	Issues relating to development and management of social sector / services relating to health
General Studies Paper III	
A	Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment;
B	Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth;
C	Inclusive growth and issues arising from it;
D	Infrastructure Energy, Ports, Roads, Airports, Railways etc. Government budgeting;
E	Land reforms in India
F	Major crops, cropping patterns in various parts of the country, different types of irrigation and irrigation systems;
G	Storage, transport and marketing of agricultural produce and issues and related constraints;
H	e-technology in the aid of farmers; Technology Missions; Economics of Animal-Rearing.
I	Issues of buffer stocks and food security, Public Distribution System- objectives, functioning, limitations, revamping;
J	Food processing and related industries in India – scope and significance, location, upstream and downstream requirements, supply chain management;
K	Issues related to direct and indirect farm subsidies and minimum support prices
L	Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology;
M	Indigenization of technology and developing new technology;
N	Developments and their applications and effects in everyday life;
O	Issues relating to intellectual property rights
P	Conservation, environmental pollution and degradation, environmental impact assessment
Q	Disaster and disaster management
R	Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security;
S	Money-laundering and its prevention;

T	Various forces and their mandate;
U	Security challenges and their management in border areas;
V	Linkages of organized crime with terrorism;
W	Role of external state and non-state actors in creating challenges to internal security;
X	Linkages between development and spread of extremism.
General Studies Paper IV	
A	Ethics and Human Interface: Essence, determinants and consequences of Ethics in human actions;
B	Dimensions of ethics;
C	Ethics in private and public relationships. Human Values - lessons from the lives and teachings of great leaders, reformers and administrators;
D	Role of family, society and educational institutions in inculcating values.
E	Attitude: Content, structure, function; its influence and relation with thought and behaviour;
F	Moral and political attitudes;
G	Social influence and persuasion.
H	Aptitude and foundational values for Civil Service , integrity, impartiality and non-partisanship, objectivity, dedication to public service, empathy, tolerance and compassion towards the weaker sections.
I	Emotional intelligence-concepts, and their utilities and application in administration and governance.
J	Contributions of moral thinkers and philosophers from India and world.
K	Public/Civil service values and Ethics in Public administration: Status and problems;
L	Ethical concerns and dilemmas in government and private institutions;
M	Laws, rules, regulations and conscience as
N	sources of ethical guidance;
O	Accountability and ethical governance; strengthening of ethical and moral values in governance; ethical issues in international relations and funding;
P	Corporate governance.
Q	Probity in Governance: Concept of public service;
R	Philosophical basis of governance and probity;
S	Information sharing and transparency in government, Right to Information, Codes of Ethics, Codes of Conduct, Citizen's Charters, Work culture, Quality of service delivery, Utilization of public funds, challenges of corruption.
T	Case Studies on above issues.