

ECONOMY**Why did FIU IND Act against Virtual Asset Providers?****Background**

- On December 28th 2023, the Financial Intelligence Unit India (FIU IND) issued show cause notices to nine offshore Virtual Digital Asset Service Providers (VDA SPs).
- These VDA SPs include Binance, Kucoin, Huobi, Bitfinex and MEXC Global, among others.
- The Director FIU IND wrote to the Secretary, Ministry of Electronics and Information Technology to block the URLs of the above-mentioned entities.

What are Virtual Digital Assets?

- The Financial Action Task Force (FATF) defines a virtual asset as “A digital representation of value that can be digitally traded, transferred and used for payment or investment purposes“.

What is the Premise of the Noncompliance?

- In March 2023, VDA SPs in India were brought under anti-money laundering/counter financing of terrorism regulations.
- They were mandated to comply with Prevention of Money Laundering Act (PMLA) 2002, verify the identities of on boarded clients, and maintain records of their financial positions and potentially suspicious transactions.
- This obligation applies to all VDA SPs operating in India irrespective of physical presence.
- Nonregistration made entities noncompliant despite serving Indian users.
- To put it in perspective, the entities “though catering to a substantial part of Indian users were not getting registered and coming under the Anti Money Laundering (AML) and Counter Financing of Terrorism Network (CFT) framework”.
- Currently, 31 VDA SPs have registered with FIU IND.
- However, several offshore entities though catering to a substantial part of Indian users were not getting registered and coming under the Anti Money Laundering (AML) and Counter Financing of Terrorism (CFT) framework.

Why VDA SPs have been made to Comply with PMLA 2002?

- The objective of the PMLA and its reporting obligation are to enable monitoring and tracking of financial transactions to curb money laundering and terror financing.
- Complying with the PMLA 2002 addresses one of the primary concerns of any regulator about the purported anonymity of the crypto assets and their potential use for unlawful purpose.
- This is also in line with India’s efforts through the G20 where it has been advocating for global regulation of cryptocurrency.
- The regulation casts reporting, record keeping, and other obligations on the VDA SPs under the PML Act which also includes registration with the FIU IND.
- Mandatory KYC verifications would ensure lack of anonymity and businesses not encountering multiple hurdles.

How are other Countries Regulating Virtual Assets?

- In Dubai (UAE), they follow licensing framework. The mandatory licenses are comprehensively categorised based on the service that the entity wants to offer in the market.
 - For obtaining the mandatory license in the Emirate, it imposes an obligation to comply with AML-CFT laws relevant to “its VA activities, businesses or operations in any jurisdiction at all times”.
- In the European Union, the Markets in Crypto-Assets Regulation (MiCA) endeavours to institute uniform EU market rules for crypto-assets.
 - The regulation is premised around “transparency, disclosure, authorisation and supervision of transactions”.
 - It would provide measures to tackle market manipulation, prevent money laundering, terrorist financing and other criminal activities.
 - Service providers under this common law would require authorisation to operate in the region.

- Though entered into force in June 2023, the legislation is still in consultation stages. The final report is expected in June 2024.
- Across the Atlantic, the U.S. does not have a thorough nationwide regulatory framework at present.
 - Some digital assets and related activities are covered under certain existing regulations, such as the Bank Secrecy Act and the Anti-Money Laundering Act of 2020.

What Considerations emerge when looking to Regulate VDAs?

- The Bureau for International Settlements (BIS), in a report about financial stability from crypto assets in emerging economies (August 2023) observed three high-level policy options under consideration.
 - These include an outright ban, containment and regulation.
- BIS observed that an outright ban may not prove enforceable.
- This is because of the pseudo anonymous nature of crypto markets. There could be a possibility that regulators lose all sight of the market, further shrinking their transparency and making them less predictable.
- Containment would imply controlling the flows between crypto markets and traditional financial systems.
- However, BIS argued that the strategy would not address the vulnerabilities inherent in the crypto markets and could result in financial stability risks.
- About regulation, motivation to regulate the asset varies across jurisdictions.
- The report holds that it must be ensured that the benefits of regulating and supervising are greater than the costs involved.
- Furthermore, for emerging market economies three issues are of importance, that is:
 - Defining the (regulatory) authority or entity and their scope,
 - Scope of regulation in terms of either activity or entity,
 - Filling in the data gaps to understand the technology and interconnections.

SCIENCE & TECHNOLOGY**XPoSat Mission****Why in news?**

- Indian Space Research Organisation (ISRO) put its first polarimetry mission X-ray Polarimeter Satellite (XPoSat) on January 1.
 - ISRO's PSLV-C58 has launched XPOSAT Satellite.
- XPoSat is the world's second satellite-based mission dedicated to making X-ray polarimetry measurements.

Polarisation of X-rays

- About
 - X-rays comprise electric and magnetic waves that are constantly in motion. Being sinusoidal waves, they do not follow a patterned direction of motion.
 - Whereas, a polarised X-ray is both organised and has two waves vibrating in the same direction.
- Sources that emit polarised X-rays
 - When magnetars or black holes emit X-rays, they encounter a wide variety of materials in the Universe.
 - As X-rays pass through the thick cloud of materials, the electric component of the X-ray emits a photon in a changed direction, as it has now undergone scattering.
 - In the process, the new photon has got polarised in a direction perpendicular to the plane formed between the original and scattered photon.
- Polarisation measurements
 - The polarisation measurements – angular and degree of polarisation – are believed to provide clues about:
 - the bright X-ray emitting sources the nature of these radiations and
 - the complex process they undergo.

X-ray Polarimeter Satellite (XPoSat)

- About
 - It is the first dedicated satellite from ISRO to carry out research in space-based polarisation measurements of X-ray emission from celestial sources.
 - It is designated for observation from low earth orbit (~ 650 km, low inclination of ~ 6 degree).
 - It has an estimated mission life of about five years during which XPoSat will observe sources that emit polarised X-rays.
 - The observations will be done when the magnetars or neutron stars (they are highly magnetic and display a wide array of X-ray activity) are in transit through the Earth's shadow, for instance, during the eclipse period.
- Scientific payloads onboard XPoSat
 - XPoSat comprises two payloads, including Indian X-ray Polarimeter (POLIX) and X-ray Spectroscopy and Timing (XSPECT).
 - They have been built by Raman Research Institute and UR Rao Satellite Centre, both located in Bengaluru.
 - POLIX:
 - It is the world's first instrument designed to operate in the medium X-ray of 8 to 30 kilo electron Volt (keV) energy band.
 - It comprises a collimator, which is the key component to filter light originating from bright sources in the field of view.
 - Moreover, there is a scatterer consisting of four X-ray proportional counter detectors (that prevent the trapped light from escaping).
 - It will observe a few tens of astronomical sources. It was conceived, designed, and built at RRI.
 - XSPECT:
 - It is designed to conduct fast timing and high spectroscopic resolution in a soft X-ray energy band (0.8-15 keV).
 - It will observe a variety of sources like X-ray pulsars, black hole binaries, low-magnetic field neutron stars, active galactic nuclei or AGNs and magnetars.
 - AGNs are a compact region at the centre of a galaxy that emits a significant amount of energy across the electromagnetic spectrum.

Significance of XPoSat Mission

- X-ray polarisation measurements in medium energy bands for the first time
 - So far, polarisation of celestial sources was done either in the optical or radio bands.
 - XPoSat, however, will facilitate X-ray polarisation measurements possible from bright sources, that too, in the medium energy band (8-30 keV) energy range.
 - This has never been attempted ever before.
- Analyse two kinds of sources
 - XPoSat will observe two kinds of sources — persistent sources (targeted and known sources) and transient sources (pulsars, active galactic nuclei, magnetars).
- Nature of the radiations and the multitudes of processes involved can be analysed
 - Out in space, X-rays get polarised due to multiple causes.
 - For example, X-rays when subject to strong magnetic fields or due to the interactions with material present around black holes.
 - With the help of XPoSat, scientists can now probe the nature of the radiations and the multitudes of processes involved in the generation of these radiations.
- Will aid the researchers by analysing the additional parameters
 - POLIX will undertake important measurements like the degree and angle of polarisation of X-ray photons from various potential sources.
 - These two additional parameters, along with the spectrographic, timing and imaging data, will aid researchers to overall improve the present understanding of the celestial bodies.

How does XPoSat compare with X-ray experiments or missions globally?

- Indian astronomers, using AstroSat performed timing and broadband spectroscopy of X-ray sources but no polarisation studies were performed.
 - AstroSat is India's first astronomy-based space missions that was launched in September 2015.
- The lack of development of highly sensitive and precise instruments makes missions for polarisation measurements of X-rays extremely challenging.
- In 2021, NASA launched Imaging X-ray Polarimetry Explorer (IXPE).
 - It has been designed to operate and perform X-ray polarisation measurements within the soft X-ray band (2 to 8 keV energy band).

Besides complementing IXPE, XPoSat's payload POLIX will offer an expanded observational energy band, as it is designated to perform X-ray polarisation in the medium X-ray band (8 to 30keV).

PRELIM FACTS

1. Bubble Baby Syndrome

- A two-month-old girl with bubble baby syndrome underwent bone marrow transplant (BMT) in Mumbai recently.

About Bubble Baby Syndrome:

- 'Bubble baby syndrome,' known medically as Severe Combined Immunodeficiency (SCID) is very rare genetic disorder that causes life-threatening problems with the immune system.
- It is a type of primary immune deficiency.
- The disease is known as "living in the bubble" syndrome because living in a normal environment can be fatal to a child who has it.
- Causes:
 - Inherited mutations in more than a different genes cause SCID.
 - This means one or both birth parents pass down the disease to their child.
- Symptoms: Babies with SCID may appear healthy at birth, but problems can start soon after, such as:
 - failure to thrive
 - chronic diarrhea
 - frequent, often serious respiratory infections
 - oral thrush (a type of yeast infection in the mouth)
 - other bacterial, viral, or fungal infections that can be serious and hard to treat.
- Treatment:
 - SCID is a pediatric emergency. Without treatment, babies are not likely to survive past their first birthday.
 - The most common treatment is a stem cell transplant (also called a bone marrow transplant). This means the child receives stem cells from a donor. The hope is that these new cells will rebuild the child's immune system.

2. KH-22 Missile

- Ukraine Air Force spokesperson recently disclosed that the country's air defense units were unable to shot down any of the Kh-22 supersonic cruise missiles launched by Russia.

About KH-22 Missile:

- It is a Soviet-era long-range airborne supersonic cruise missile.
- Armed with a nuclear or highly explosive fragmenting cumulative warhead, it was initially designed to destroy aircraft carriers and other large warships, or even groups of such carriers.
- The Kh-22 family was developed in the USSR in the 1960s and specifically designed to be launched from Tupolev-22 bombers.
- Later, both the missiles and the aircraft were modernized as part of the so-called "Kh-22 special air-to-surface missile complex."
- Upgraded in the 1970s, the missile had an impressive speed of 4,000 kilometers per hour, a 1,000-kilogram warhead, and a range of 500 kilometers.
- It weighs 5,820 kilograms.
- A total of approximately 3,000 such missiles were produced in the USSR.

- After the USSR collapsed, quite a few of them remained in Ukraine. However, soon after independence in 1991, Ukraine gave up its nuclear and strategic aviation arsenal.
- In 2000, Ukraine transferred 386 Kh-22 missiles to Russia as an installment against the gas debt.
- The successor to the Kh-22 became the Kh-32, which can be carried by the new Russian Tu-22M3M bombers. The new missile features a conventional warhead, an improved rocket motor, and a new radar imaging terminal seeker. It has a longer range but a smaller warhead.

3. e-SCR Portal

- The Electronic Supreme Court Reports (e-SCR) portal starts with just 2,238 translated judgments as of January 2023 and ends the year with over 31,000 rulings translated.

About e-SCR portal:

- It is an initiative to provide the digital version of the apex court's judgments in the manner as they are reported in the official law report.
- The Supreme Court has developed a search engine with the help of the National Informatics Centre.
- It comprises elastic search technique in the database of e-SCR and the search facility in e-SCR provides for free text search, search within search, case type and case year search, judge search, year and volume search and bench strength search options.
- It will provide free access to it's about 34,000 judgements to lawyers, law students and the common public.
- These verdicts will be available on the apex court website, its mobile app and on the judgment portal of the National Judicial Data Grid (NJDG).

Key facts about National Judicial Data Grid:

- It is a national repository of data relating to cases instituted, pending, and disposed of by the courts across the length and breadth of the country.
- It has been developed by National Informatics Centre (NIC) in close coordination with the in-house software development team of the Computer Cell, Registry with an interactive interface and analytics dashboard.
- The entire database shall be periodically updated on the NJDG portal.
- Through this one may access case related information, statistics such as institution, pendency and disposal of cases, case-types, year-wise break-up of the Supreme Court of India.

4. Eurozone

- The eurozone economy is set for only modest growth next year, despite wages rising faster than inflation for the first time in three years, according to a recent poll of economists.

About Eurozone

- The eurozone, officially known as the euro area, is a geographic and economic region that consists of all the European Union countries that have fully incorporated the euro as their national currency.
- As of January 2023, the eurozone consists of 20 countries in the European Union (EU):
- Austria, Belgium, Croatia, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, and Spain.
- Not all European Union nations participate in the Eurozone; some opt to use their own currency and maintain their financial independence.
- The European Central Bank (ECB) exercises the sole power to set the monetary policy for the Eurozone countries.
 - The ECB exercises the sole authority to decide the printing and minting of euro notes and coins. It also decides the interest rate for the Eurozone.
 - The ECBs is headed by a president and a board, comprising the heads of the central banks of the participating nations.
- How do countries join Eurozone?
 - In order to join the euro area, EU member states are required to fulfil so-called 'convergence criteria' which consists of price stability, sound public finances, the durability of convergence, and exchange rate stability.

- These binding economic and legal conditions were agreed upon in the Maastricht Treaty in 1992 and are also known as 'Maastricht criteria'.
- All EU Member States, except Denmark, are required to adopt the euro and join the euro area once they are ready to fulfill them.
- The Treaty does not specify a particular timetable for joining the euro area but leaves it to member states to develop their own strategies for meeting the condition for euro adoption.
- The European Commission and the ECB jointly decide whether the conditions are met for euro area candidate countries to adopt the euro.

What is European Union (EU)?

- The EU is a political and economic union of 27 member states located primarily in Europe.
- The EU was established by the Maastricht Treaty, which entered into force on November 1, 1993.
- The main goal of the EU is to promote cooperation and integration among its member states in order to enhance economic and political stability in Europe.
- The EU has its own currency, the Euro, which is used by 19 of the member states.
- It has a single market where goods, services, and capital can move freely.

5. Exercise Desert Cyclone

- The Joint Military Exercise 'Desert Cyclone 2024' between India and UAE will be held from January 2 to January 15 in Rajasthan.

About Exercise 'Desert Cyclone':

- It is the inaugural edition of joint military exercise "Desert Cyclone 2024" between India and the United Arab Emirates (UAE).
- The exercise aims to enhance interoperability by learning & sharing best practices in Urban Operations.
- This exercise is marking a significant milestone in the strategic partnership.

Key facts about India and UAE relations:

- India and the UAE established diplomatic relations in 1972 and UAE opened its Embassy in Delhi in 1972 whereas India opened its Embassy in Abu Dhabi in 1973.
- The first-ever India-UAE Joint Air Forces exercise took place in September 2008 at the Al-Dhafra base in Abu Dhabi.
- India has also been a regular participant at the biennial International Defence Exhibition (IDEX) in Abu Dhabi.
- Earlier this year, two ships of the Indian Navy, INS Visakhapatnam, and INS Trikand participated in bilateral exercise 'ZayedTalwar' with the UAE to enhance interoperability and synergy between the two navies.

ANSWER WRITING

What is the impact of climate change on agriculture? Discuss the measures to mitigate the impact of climate change on Agriculture.

Climate change is having profound impacts on the agricultural sector. Changes in temperature and precipitation patterns, increasing intensity of extreme weather events, and rising atmospheric CO₂ are having direct and indirect effects on crop yields, water availability, nutrient cycling, and livestock health.

According to the UN Intergovernmental Panel on Climate Change (IPCC), crop yields could fall by 10-25% by 2050 due to higher temperatures and extreme weather events.

Impact of climate change on Agriculture:

- Increasing temperature: Climate change is causing temperatures to rise, resulting in longer growing seasons and more intense heat waves. This can be beneficial for some crops, such as corn and soybeans, but can also create more stress on other crops, such as wheat and barley. Additionally, extreme heat can lead to decreased productivity, higher water requirements and increased risk of pest and disease outbreaks
- Decreasing precipitation: There is changes in precipitation patterns, both in terms of the amount and timing of precipitation. These changes are making drought conditions more

common and causing floods in many areas. This can lead to crop losses due to decreased water availability, soil erosion and increased weed and pest pressure.

- Increased pests and diseases: Warmer temperatures and increased precipitation can lead to increased pest and disease pressure, leading to crop losses). For example, pests such as the maize stalk borer have been observed to be more active in warmer temperatures, leading to reduced yields in maize crops.
- Increased costs for farmers: There are increased costs for farmers, due to the need for new equipment, increased labour costs, and increased costs for inputs such as fertilizers and pesticides. This can also result in food inflation.
- Increased food insecurity: The food insecurity is increased due to changes in crop yields, increased costs for farmers, and changes in food prices. This can have serious implications for populations in developing countries, which are often more vulnerable to the impacts of climate change.

Measures to mitigate the impact of climate change on Agriculture:

- Improved Crop Varieties: As climate conditions change, farmers need to adjust their crops accordingly. This includes selecting varieties that are more tolerant of extreme temperatures and droughts. For example, maize varieties in Africa that have been bred specifically for heat tolerance have been shown to offer a yield advantage of up to 10%.
- Irrigation: A well-managed irrigation system can be a powerful tool for limiting the effects of climate change on agriculture. By decreasing the dependence on rainfall, farmers are able to ensure that their crops are receiving the water they need to thrive, even during periods of prolonged drought.
- Precision Agriculture: Precision agriculture uses technology to monitor crop growth and soil health in order to make more informed decisions about planting and fertilization. This can help farmers optimize their yields and reduce their environmental impact.
- Agroforestry: Agroforestry combines traditional agricultural practices with tree cultivation. This helps to reduce soil erosion and increase carbon sequestration, while also providing a source of income for farmers.
- Water Harvesting: Water harvesting is a simple and effective way to capture rainfall and store it for future use. This can be especially helpful for farmers in areas prone to long periods of drought.
- Climate-Smart Agriculture: Climate-smart agriculture is a set of practices that aim to increase agricultural productivity while also reducing greenhouse gas emissions. This includes practices such as the use of improved crop varieties, efficient irrigation systems, and sustainable land management.

Conclusion

Agriculture is the primary source of food for much of the world’s population, and it is becoming increasingly difficult to produce food in an unpredictable climate. Tackling climate change is necessary to protect and preserve the agricultural industry. By reducing greenhouse gas emissions, investing in renewable energy, and developing sustainable agricultural practices, we can reduce the impacts of climate change, improve agricultural yields, and protect farmers and producers.

MCQs

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| <p>1. With reference to Eco Sensitive Zone (ESZ), consider the following statements:</p> <p>1.An ESZ has stricter regulations compared to a National Park.</p> <p>2.The buffer zone concept in ESZ management refers to an area where stricter regulations apply to minimize impacts on the core zone.</p> <p>3.Economic potential and development prospects are among the factors considered for designation as an ESZ.</p> | <p>How many of the statements given above are correct?</p> <p>a) Only one</p> <p>b) Only two</p> <p>c) All three</p> <p>d) None</p> <p>2. Which one of the following is the objective of Smart Lander for Investigating Moon (SLIM) Mission?</p> <p>a) It aims to search for signs of water ice on the Moon surface.</p> |
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- b) It aims to deploy a network of seismic sensors for understanding lunar structure.
c) It aims to test and demonstrate new technologies for future lunar missions.
d) It aims to collect and analyze lunar soil samples for resource potential.
3. With reference to the University Grants Commission (UGC) consider the following statements:
1. It is a statutory body set up by the Indian Union government in accordance with the UGC Act, 1956.
2. One of its functions is to set curriculum for all Universities in India.
3. It recognizes Technical Universities of India.
Which of the statements given above is/are correct?
a) 1 and 2 only
b) 1 only
c) 2 and 3 only
d) 3 only
4. Consider the following statements:
1. The suffrage (right to vote) movement amongst women gained pace in the West after World War-I.
2. France was the first nation to let women vote in national elections.
Select the correct statements using the codes given below:
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2
5. In the context of bilateral relations between India and Russia, consider the following statements:
1. A major factor fostering close India-Russia ties is the common concern over rising Chinese influence in Asia.
2. Diverging strategic interests in the Middle East is one of the key challenges in India-Russia relations.
3. India and Russia are engaged in joint exploration of Arctic resources.
How many of the statements given above are correct?
a) Only One
b) Only two
c) All three
d) None
6. The Indian government has launched several initiatives to boost the shipping industry. Which one of the following is NOT directly included in the government's initiatives to boost the Indian shipping industry?
a) Sagarmala Project
b) Make in India
c) Coastal Shipping Policy
d) Green Shipping Policy
7. Which one of the following passes connects the Ladakh region with the rest of Jammu & Kashmir?
a) Zoji La
b) Rohtang Pass
c) Nathu La
d) Banihal Pass
8. In hydroponics, plants are grown without soil using:
a) Organic matter like compost
b) A combination of soil and water
c) A nutrient-rich water solution
d) Specialized nutrients sprayed on leaves
9. Consider the following statements:
1. Increased government control over citizens
2. Violations of individual privacy rights
3. Identity theft and financial fraud
How many of the above is/are the concerns/risks associated with Pegasus spyware?
a) Only One
b) Only two
c) All three
d) None
10. With reference to Organization of the Petroleum Exporting Countries (OPEC) consider the following statements:
1. One of its objectives is to promote research and development in renewable energy sources.
2. It regulates oil production mainly through negotiating deals with oil-consuming nations.
Select the correct statements using the codes given below:
a) 1 only
b) 2 only
c) Both 1 and 2
d) Neither 1 nor 2