14 June 2021: UPSC Exam Comprehensive News Analysis

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A. GS 1 Related

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B. GS 2 Related

Category: INTERNATIONAL RELATIONS

1. Fight against authoritarianism, extremism, says PM at G7 meet

Context:

- India's participation in the special outreach sessions for guest countries at the G7 summit.

Major highlights:

- The Indian Prime Minister has stated that India being the world's largest democracy, qualifies as a **natural ally of the G7** to fight against threats of authoritarianism.
- India has also called for joint efforts in the **fight against terrorism and violent extremism, disinformation and infodemics and economic coercion.**
- The Indian administration has stated that it will study U.S. President Joseph Biden's proposal for a **"Build Back Better World" (B3W) initiative**, keeping in mind the principles of "transparency and inclusion".
- India has supported the call for a timely, transparent, expert-led, and science-based WHO-convened Phase 2 **COVID-19 Origins study**.
- India also sought **support from the G7 countries for the joint India-South Africa proposal for a TRIPS (Intellectual Property Rights) waiver** for coronavirus-related medicines and vaccines.
    - **The G7 has committed to donating a billion vaccines to poorer countries.**
- The Indian administration has stopped short of direct references to China as against the main 25-page G7 communique, which contained negative references to China on the issue of its aggression in the East and South China Sea, and human rights issues in Xinjiang.

2. Rare earth metals at the heart of China-U.S. rivalry

Context:

- Recently, the U.S. Senate passed the **U.S. Innovation and Competition Act**, aimed at countering China's technological ambitions.
    - Among many other interventions, the bill also **aimed at improving American competitiveness in the rare earth metals market.** The bill includes several provisions to help improve critical minerals supply chains.

Background:

Rare earth metals:

- Rare earth metals are a **group of 17 elements** - lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium, yttrium - that appear in low concentrations in the ground. They are lustrous silvery-white soft heavy metals.
- Although they are more abundant than their name implies, **they are difficult and costly to mine and process cleanly.**

Use of rare earth metals:

- Rare earths **find application in a wide range of products** including rechargeable batteries for electric and hybrid cars, advanced ceramics, computers, DVD players, wind turbines, catalysts in cars and oil refineries, monitors, televisions, lighting, lasers, fiber optics, superconductors, mobiles and glass polishing as well as **military jet engines, satellites and lasers**.
- Lanthanum is needed to manufacture night vision devices.
- These rare minerals **are essential to the manufacture of electric vehicles, wind turbines and drones** considered very important sectors in the coming future.
    - Rare earth minerals like neodymium, praseodymium and dysprosium, are crucial to the manufacture of magnets used in wind turbines and electric cars. Hence **the transition to green energy is dependent on the availability of these critical rare earth metals.**

China's dominance in rare earth metals:

- The rare earth metals are **largely extracted and refined in China**.
    - Most of the rare earth metal reserves are located within China. After China, the major rare earth countries based on reserve volume are Vietnam, Brazil, and Russia.
    - China hosts most of the world's processing capacity and in 2017, **China accounted for 81% of the world's rare earth production.**
- In 2019, the U.S. imported 80% of its rare earth minerals from China, while the EU gets 98% of its supply from China.

Details:

- **Rising tensions between the United States and China** have sparked concerns over China's dominant position as a supplier of rare earths.
- China's dominance in the critical rare earth metals, key to the future of manufacturing, is a cause of concern for the U.S., given that **China could as well use its dominance in the sector to cut off supplies to the west in case of a geopolitical friction.**
    - Example - Japan accused China of halting rare earth supplies for political reasons (in the aftermath of a diplomatic dispute between China and Japan in 2010), sparking recognition worldwide of the risks of dependence on one supplier.
- Recognizing the fact that the failure to expand its semiconductor production, or reroute rare earths supply chains, could leave the U.S. at a strategic disadvantage in the years ahead, the act makes several recommendations in this regard.
    - The U.S. aims to **boost domestic production and processing of rare earths and lithium**, another key mineral component, while working with allies to **increase sustainable global supply and reduce reliance on competitors like China.**
    - **Recycling** has also emerged as a potential source for rare earth minerals. Scaling up recycling could help meet a substantial proportion of the demand for rare earth metals.

Additional information:

- The **Mountain Pass mine** is located in California, U.S.
    - The Mountain Pass Mine is an open-pit mine of rare-earth elements. In 2020 the mine supplied 15.8% of the world's rare-earth production.

C. GS 3 Related

Category: ENVIRONMENT AND ECOLOGY

1. G7 agrees to boost climate finance, calls on others to join

Context:

- **Climate action deliberations in the ongoing G7 summit.**

Background:

Green Climate Fund:

- The Green Climate Fund (GCF) is a fund established within the **framework of the UNFCCC** as an **operating entity of the Financial Mechanism** to assist developing countries.
    - **The Copenhagen Accord**, established during the 2009 United Nations Climate Change Conference (COP-15) in Copenhagen first considered the idea of a Green Climate Fund.
    - GCF was formally established under the **Cancun Agreements in 2010** during the 2010 United Nations Climate Change Conference in Cancun.
- The objective of the Green Climate Fund is to **support projects, programmes, policies and other activities in developing country parties to help them in adaptation and mitigation practices** to counter climate change.
- The Fund has set itself a goal of **raising $100 billion a year by 2020.**
- The GCF is based in Incheon, South Korea.

Significance of Green Climate Fund:

Climate finance needed:

- **The World Economic Forum projects that by 2020, about $5.7 trillion will need to be invested annually in green infrastructure to meet the Paris agreement targets**. The poor and

developing countries are not in a position to mobilize funds to this extent and therein lies the need for a dedicated funding mechanism like the Green Climate Fund.

- Climate finance will help the developing and underdeveloped countries cut carbon emissions and cope with global warming by enabling their shift to renewable and sustainable technology while also helping them adapt to climate change.

Higher per capita emission:

- **The G7 countries account for 20% of global carbon emissions while supporting a smaller proportion of the overall global population**. This necessitates the need for the G7 nations to reduce their GHG emissions and reduce their carbon footprint.

Legacy emission of the developed world:

- Also, given that the G7 nations consisting of some of the **richest economies have had the advantage of early development based on high carbon usage**, these nations need to shoulder some responsibility for their historical GHG emissions. This would be in line with the principle of **Common but Differentiated Responsibilities and Respective Capabilities (CBDR–RC).**
    - Common but Differentiated Responsibilities and Respective Capabilities (CBDR–RC) is a principle within the United Nations Framework Convention on Climate Change (UNFCCC) that acknowledges the different capabilities and differing responsibilities of individual countries in addressing climate change.

Disproportionate impact on the poor and developing countries:

- Also despite being the smallest contributors to the overall GHG emissions, **the poor and developing world continue to remain the most affected countries by climate change**. Their fragile economic and social conditions make them very vulnerable to the impacts of climate change. This necessitates the need for greater focus on these vulnerable countries and hence the need to provide financial assistance to them through climate finance. This would be in line with the **principle of climate justice.**
    - Climate justice acknowledges the fact that climate change can have differing social, economic, public health, and other adverse impacts on underprivileged populations. Climate justice requires that these inequities be addressed through long-term mitigation and adaptation strategies. Climate justice examines concepts such as equality, human rights, collective rights, and the historical responsibilities for climate change.

Details:

- G7 leaders have pledged to **meet the climate finance target**.

- The seven nations including the U.S., Britain, Canada, France, Germany, Italy and Japan have reaffirmed their commitment to jointly **mobilize $100 billion per year from public and private sources, through to 2025**.

- They have also agreed to **raise their contribution** to meet the overdue spending pledge and have also called upon other developed countries to join and enhance their contributions too.
  - Under the Paris Agreement in 2015, developed countries had agreed that prior to 2025 a new collective quantified goal from a floor of USD 100 billion per year shall be set.

Concerns:

- The **Climate finances pledges made so far remain substantially lower than the targeted amount**.
- Also, the pledges of cash promises lack specifics and hence cannot be counted as concrete commitments on climate finance.
- Some green groups were unimpressed with the climate pledges and have reiterated the demand on the rich economies to consider new and additional climate finance.

D. GS 4 Related

Nothing here for today!!!

E. Editorials

Category: DEFENCE AND SECURITY

1. The world is hardly wired for cyber resilience

Background:

- There have been a **series of high profile cyber attacks in recent months**.
  - The end of 2020 witnessed the **'SolarWinds' cyberattack** involving data breaches across critical wings of the U.S. government like defence, energy and state.
  - Early 2021 witnessed a **cyberattack by a Chinese group called Hafnium**. Thousands of U.S. organizations were hacked and remote control was gained over the affected systems.
  - Then there was the **ransomware attack on Colonial Pipeline** (which is the main supplier of oil to the U.S. East Coast) by Russia/East Europe-based cybercriminals, styled DarkSide. Colonial Pipeline had to pay out several million dollars as ransom to unlock its computers and release its files.

- **A Russia-backed group, Nobellium, had launched a phishing attack** on 3,000 e-mail accounts, targeting USAID and several other organisations.
- Recently **JBS SA**, the U.S. subsidiary of a Brazilian meat processing company, was the target of a **ransomware attack.**

Challenges:

Targeting critical civilian targets:

- Unlike the traditional approach to cyber warfare, **cyber attacks are now being employed against civilian targets of critical importance.** The fact that most nations have been concentrating mainly on cyber defences to protect military and strategic targets has left civilian targets vulnerable to attacks.
- Unlike previously where the banking and financial services were most prone to ransomware attacks, recently even oil, electricity grids, and health care are being increasingly targeted.
- Defending critical civilian targets against cyberattacks is almost certain to stretch the capability and resources of governments across the globe.

Increasing sophistication of the cybercriminals:

- The technical competence of cybercriminals has only increased. They have been employing advanced methods like '**penetration testers**' to probe high secure networks.
- **Zero day software vulnerabilities** are being increasingly used for cyber attacks such as **ransomware, phishing and spear phishing**.
    - **A zero-day is a computer-software vulnerability** unknown to those who should be interested in its mitigation. Until the vulnerability is mitigated, hackers can exploit it to adversely affect programs, data, additional computers or a network.
    - Ransomware is malware that employs encryption to hold a victim's information at ransom. A user or organization's critical data is encrypted so that they cannot access files, databases, or applications. A ransom is then demanded to provide access.
    - Phishing is a type of social engineering attack often used to steal user data, including login credentials and credit card numbers or to deploy malicious software on the victim's infrastructure like ransomware. It occurs when an attacker, masquerading as a trusted entity, dupes a victim into opening an email, instant message, or text message.
    - Spear phishing is the fraudulent practice of sending emails ostensibly from a known or trusted sender in order to induce targeted individuals to reveal confidential information.
- Cybercriminals are becoming more sophisticated in their modus operandi. They first steal sensitive data in targeted computers before launching a ransomware attack thus resulting in a kind of **'double jeopardy' for the targeted victim.**

Diversification of motivation for the attacks:

- The motivation for cyberattacks has also diversified beyond just **geopolitical and profits**, with **'insider threats'** due to discontent with the management or personal reasons also emerging as a possible threat.

Targeting of high value and vulnerable sectors:

- Notably, the number of **cyberattacks on healthcare systems has increased** and cybercriminals are increasingly trying to gain access to patients' data. The available data aggravates the risk not only to the individual but also to entire communities.

Challenges associated with data protection:

- With **data becoming valuable** in an increasingly digitized world, attacks on data and data systems are bound to intensify.
- More than three quintillion bytes of data are generated every day and several billion devices are interconnected to billions of endpoint devices and are exchanging petabytes of sensitive data, on the network. This is only bound to grow. **Ensuring data protection of this huge quantity of data is going to be a herculean task.**

Way forward:

Improve awareness and preparedness:

- Businesses need to be aware of the nature of the cyber threat to their businesses and take **adequate precautionary measures**.
- Officials in the public domain and also company boards need to carry out **regular vulnerability assessments and create necessary awareness of the growing cyber threat**.
- There is the need for improved defences against actual, and potential, cyberattacks by all countries across continents.

Zero trust-based environment:

- Cybersecurity professionals are now engaged in building a 'Zero Trust Based Environment', viz., zero trust on end point devices, zero trust on identity, and zero trust on the network to protect all sensitive data.
- Zero Trust Based environment technologies employ: software-defined solutions for **agile perimeter security, secure gateways, cloud access security, privileged access management, threat intelligence platforms, static and dynamic data masking**, etc.

Adopting deep technology:

- Building deep technology in cyberspace is essential. New technologies such as **artificial intelligence, machine learning and quantum computing** present new opportunities which need to be harnessed.

2. Planning for a biosecure future

Context:

- The article analyzes the **biosecurity concerns of synthetic biology**.

Synthetic biology:

- Synthetic biology is a field of science where **new organisms, biological parts and devices can be created and existing natural life forms can be redesigned.**
- Synthetic biology encompasses a broad range of methodologies from various disciplines, such as biotechnology, genetic engineering, molecular biology, molecular engineering, systems biology, membrane science, biophysics, chemical and biological engineering, electrical and computer engineering, control engineering and evolutionary biology.
- Due to more powerful genetic engineering capabilities and decreased DNA synthesis and sequencing costs, the **field of synthetic biology is rapidly growing**. There has been a rapid rise in synthetic biology in the last two decades.

Significance of synthetic biology:

- Genetic engineering is finding increasing application in the area of **medical treatment** by re-engineering cells. Genetic engineering is being used to modify plants to improve resistance to pests in crops and to induce desirable qualities like resistance to droughts, waterlogging and developing faster-growing dwarf varieties. This can help ensure **food security.**

Threat posed by synthetic biology:

- While synthetic biology can be used for human betterment, there are many risks associated with the technology which must be addressed before it becomes widely accessible.
    - Much is still to be understood of the possible **long term implications of genetic engineering.**
    - Insufficiently trained staff, inadequately safeguarded facilities, and lack of proper protocols can also lead to **accidental leaks of experimental pathogens**.

- There is also the **possibility of deliberate misuse**. A planned attack using highly infectious pathogens synthetically engineered in a lab could have a devastating impact on the target country.

Lacunae in current approach to biosecurity:

Lack of focus on biosecurity:

- As against the focus on the threat posed by weapons of mass destruction like nuclear and chemical weapons, there has been **very little focus on threats emanating from biological sources**.
- Nuclear weapons, facilities and material are tightly controlled through strong treaties and institutional arrangements. Unlike this, the fields of biology or synthetic biology are not regulated internationally despite growing military interest in synthetic biology applications and their potential misuse.

Ineffectiveness of the BTWC:

- There is the **Biological and Toxin Weapons Convention (BTWC) of 1972** which regulates bio-weapons, however, it suffers from the following shortcomings.
  - There is **no implementing body** to oversee this convention which almost renders the convention ineffective.
  - The BTWC also **does not have a verification clause**, **nor does it have clearly laid down rules and procedures to guide research** in the concerned field.
    - The BTWC while bans bio-weapons, **research for medical and bio-defence purposes are allowed.** This is liable for misuse since bio-defence research routinely uses pathogens and toxins for experimental purposes, processes, know-how and outcomes of bio-defence research could potentially be used to create bio-weapons.
  - Initiatives to enhance the transparency of treaty-relevant biological facilities and activities to help deter violations of the BTWC have not been accepted by the member states.

India's vulnerability:

- India remains grossly underprepared in the domain of biosecurity.
  - There is **poor disease surveillance** to detect any threat in its early stages.
  - **Insufficient coordination among various government departments** dealing with biosecurity issues.
    - Implementation of biosafety guidelines is the responsibility of the Science and Technology Ministry and the Environment Ministry. However, labs dealing with

biological research are set up under the Indian Council of Medical Research and the Indian Council of Agricultural Research, which are under the Ministries of Health and Agriculture, respectively.

- The **bad state of the healthcare system** renders India ineffective in tackling any possible outcomes of a bio attack.
- India, with its **porous borders and ill-trained border control institutions**, is ill-prepared for defending against pathogens or dangerous biological organisms or agents arriving from abroad.

Conclusion:

- The COVID-19 pandemic and its devastating impact have challenged the traditional imagination of national security with even the most developed and rich countries crumbling under the impact of the pandemic.
- The COVID-19 pandemic should serve as a wake-up call to recognize the **biosecurity concerns of synthetic biology** and the national security studies henceforth will have to consider the threat posed by synthetic biology.
- COVID-19 pandemic is an indication of the potential impact of bio-weapons that can come from labs.
- In fact, all exponential technologies such as synthetic biology, artificial intelligence and nanotechnology have to be understood and regulated to counter any unforeseen national and global security implications.
    - Exponential technologies can be defined as those technologies that allow change at an accelerated speed.
- The **upcoming November 2021 BTWC review conference** must take stock of the advances in the field of synthetic biology, address the thinning line between biotechnology research and bio-weapons research, and consider international measures for monitoring and verification.

F. Prelims Facts

1. ₹498 crore for iDEX challenge

iDEX:

- The **Innovations for Defence Excellence (iDEX)** framework aims at the creation of an ecosystem to foster innovation and technology development in Defence and Aerospace by engaging industries including MSMEs, start-ups, individual innovators, R&D institutes & academia. It **provides them grants/funding and other support to carry out R&D** which has good potential for future adoption for Indian defence and aerospace needs.

- **iDEX will be funded and managed by the 'Defence Innovation Organization (DIO)'** which has been formed as a 'not for profit' company as per Section 8 of the Companies Act 2013.
- iDEX will function as the executive arm of DIO, carrying out all the required activities while DIO will provide high-level policy guidance to iDEX.
- The iDEX framework and establishment of the DIO by the Department of Defence Production (DDP) is aimed at **promoting innovation and indigenization in the aerospace and defence sector at the start-up level.**

Context:

- Defence Minister Rajnath Singh has approved the budgetary support of ₹498.8 crore to the Innovations for Defence Excellence (iDEX) challenge under the Defence Innovation Organisation (DIO) for the next five years.

2. Tree of coffee family discovered in Andaman and Nicobar

Context:

- **A new species belonging to the genus of the coffee family** has recently been discovered from the Andaman Islands.

Details:

- The new species has been named ***Pyrostria laljii*.**
- The new species has been reported from the **Wandoor forest in South Andaman.**
    - The other places in the Andaman and Nicobar Islands where the tree could be located are the Tirur forest near the **Jarawa Reserve Forest and the Chidia Tapu (Munda Pahar) forest.**
- It is also the **first record of the genus Pyrostria in India.**
    - Plants belonging to the genus Pyrostria are usually found in Madagascar.
    - While the genus Pyrostria is not found in India, there are several genera from the family Rubiaceae that are common in India. These plants include cinchona, coffee, adina, hamelia, ixora, galium, gardenia, mussaenda, rubia, morinda.
- *Pyrostria laljii* has been **assessed as 'Critically Endangered'** based on the International Union for Conservation of Nature's (IUCN) Red List criteria.

G. Tidbits

1. Swiss snub synthetic pesticide ban plan

Context:

- **Two publicly proposed initiatives** proposing the **prohibition of the use of artificial pesticides in Switzerland**, preventing their use in farms and gardens, and the **prohibition of the import of produce and products made using artificial pesticides** have been overwhelmingly rejected by the voters in Switzerland.
- The proposal was based on the **ecological and health impacts from the use of synthetic pesticides**. While the long-term impact of the chemicals is not yet fully known, studies have suggested links between synthetic pesticides and a range of health issues including Parkinson's and infertility.
- If adopted the proposal would have made Switzerland the first European country to ban synthetic pesticides.
- The proposal was **strongly opposed by the Swiss farming sector and the government**, which said approval would have meant lower farm production and higher food prices.
- The public support for curtailing pesticides has prompted the government to come up with a counterproposal that would **halve the risks associated with the use of pesticides within six years.**

H. UPSC Prelims Practice Questions

Q1. With reference to Bhitarkanika National Park, which of the following statements is/are correct?

1. It is a national park in the State of Odisha.
2. It is a Ramsar site.

Options:

a. 1 only
b. 2 only
c. Both
d. None

Answer: c

Explanation:

- Bhitarkanika National Park is located in northeast Kendrapara district in Odisha in eastern India. It is also a Ramsar site.

- The national park and wildlife sanctuary is inundated by the rivers Brahmani, Baitarani, Dhamra, Pathsala. It hosts many mangrove species, and is the second-largest mangrove ecosystem in India.
- The national park is home to Saltwater crocodile (*Crocodylus porosus*), Indian python, king cobra, black ibis, darters and many other species of flora and fauna.

Q2. Consider the following statements with respect to *Pyrostria laljii*:

1. It is the first record of the genus Pyrostria in India.
2. It belongs to the genus of the coffee family discovered from the Andaman Islands.
3. Its IUCN status is endangered.

Which of the above statements is/are correct?

a. 1 and 2 only
b. 2 and 3 only
c. 1 and 3 only
d. 1, 2 and 3

Answer: a

Explanation:

- A new species named *Pyrostria laljii* belonging to the genus of the coffee family has recently been discovered from the Andaman Islands.
- The new species has been reported from the Wandoor forest in South Andaman.
- It is also the first record of the genus Pyrostria in India.
- Plants belonging to the genus Pyrostria are usually found in Madagascar.
- *Pyrostria laljii* has been assessed as 'Critically Endangered' based on the International Union for Conservation of Nature's (IUCN) Red List criteria.

Q3. Which of the following statements is/are correct with respect to Kawasaki disease?

1. It is a rare viral zoonotic disease that occurs primarily in remote parts of central and west Africa, near tropical rainforests.
2. It is mostly transmitted to people from various wild animals such as rodents and primates.

Options:

a. 1 only
b. 2 only

c. Both
d. None

Answer: d

Explanation:

- Kawasaki disease is a syndrome of unknown cause that results in a fever and mainly affects children under 5 years of age. It is a form of vasculitis, where blood vessels become inflamed throughout the body.
- While the specific cause is unknown, it is thought to result from an excessive immune system response to an infection in children who are genetically predisposed. It does not spread between people.
- Kawasaki disease affects people of Asian ethnicity, particularly Japanese people. The higher incidence in Asian populations is thought to be linked to genetic susceptibility.

Q4. Which of the following is/are Rare earth minerals?

1. Neodymium
2. Selenium
3. Praseodymium
4. Dysprosium
5. Uranium
6. Thorium

Options:

a. 1, 2, 3, 4 and 5 only
b. 2, 4, 5 and 6 only
c. 1, 3 and 4 only
d. 1, 2, 3, 4, 5 and 6

Answer: c

Explanation:

- Rare earth metals are a group of 17 elements - lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium, yttrium - that appear in low concentrations in the ground. They are lustrous silvery-white soft heavy metals.

- Although they are more abundant than their name implies, they are difficult and costly to mine and process cleanly.

Q5. The "New START" treaty was in the news. What is this treaty? (UPSC 2011)

a. It is a bilateral strategic nuclear arms reduction treaty between the USA and the Russian Federation.
b. It is a multilateral energy security cooperation treaty among the members of the East Asia Summit.
c. It is a treaty between the Russian Federation and the European Union for energy security cooperation.
d. It is a multilateral cooperation treaty among the BRICS countries for the promotion of trade**Answer: a**

Explanation:

- New START is a nuclear arms reduction treaty between the United States and the Russian Federation with the formal name of Measures for the Further Reduction and Limitation of Strategic Offensive Arms. It was signed in 2010 in Prague, and, after ratification, entered into force in 2011.

I. UPSC Mains Practice Questions

1. Defending civilian targets and critical infrastructure against rising cyberattacks will stretch the capability of governments. Elaborate. (15 marks, 250 words) (GS Paper 3/Defence and Security)
2. COVID-19 has further highlighted the biosecurity concerns of synthetic biology. Discuss. (15 marks, 250 words) (GS Paper 3/Defence and Security)