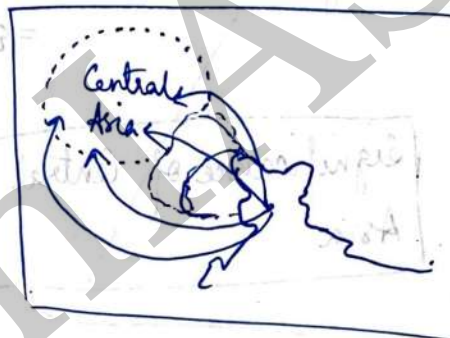
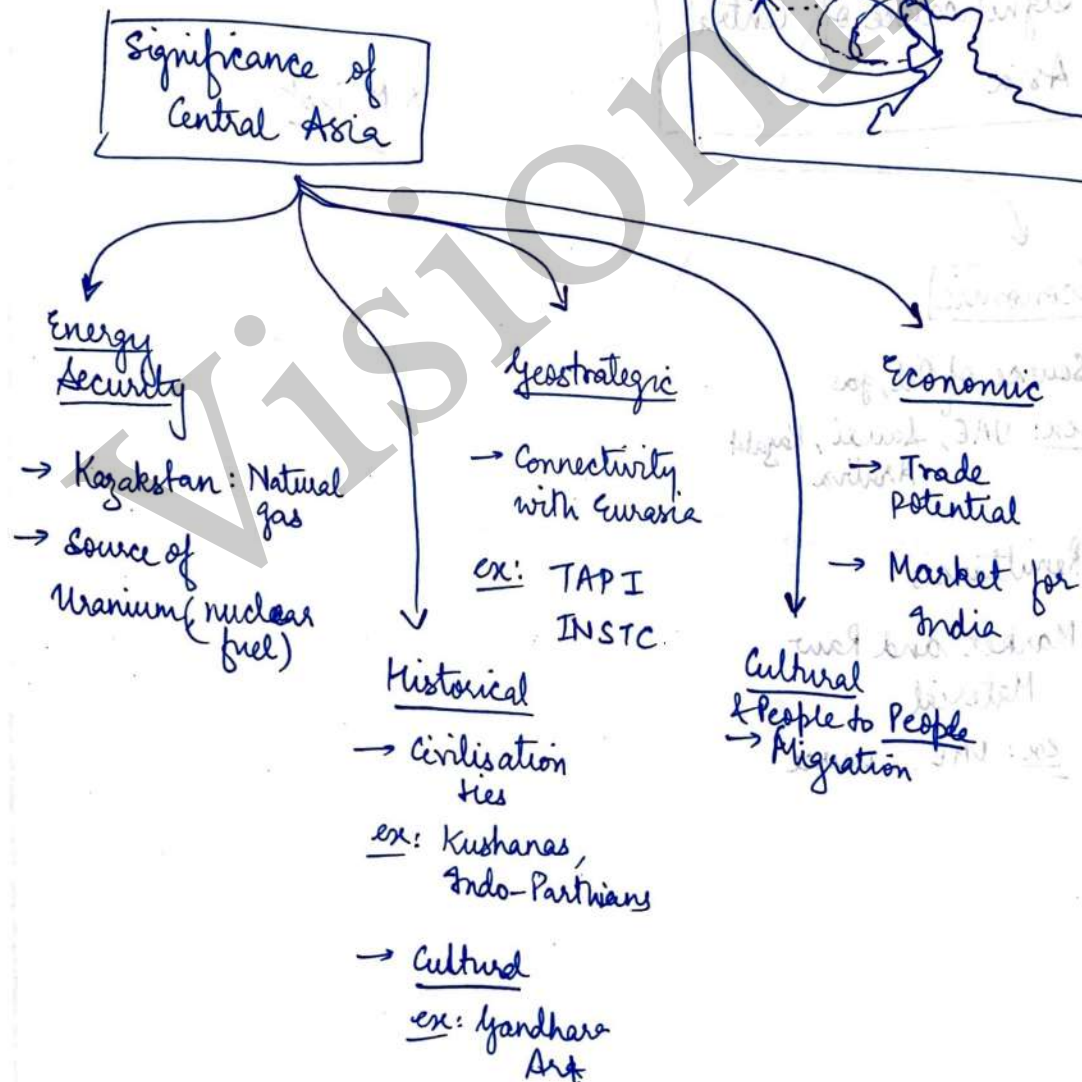


1. Highlighting significance of Central Asia for India, discuss challenges in strengthening Indo-Central Asia relationship.

Central Asia, as India's extended neighbourhood is an indispensable part of its regional foreign policy. It accounts for about \$2 billion trade that can be enhanced manifold.



Challenges in strengthening

① China's expanding influence

↳ BRI

↳ Debt or Wolf-warrior diplomacy.

ex: Kyrgyzstan and China

② Connectivity issues

↳ Blockade by Pakistan, Difficult terrain

↳ US sanctions on Iran (Schemes get effected)

③ Resource crunch

↳ To help region in infrastructure.

④ Untapped trade potential

With commitments of political leaders, the ties could be strengthened to have a mutual-benefit based relationship.

2. Discuss the role that Indian diaspora can play in the making of "Atmanirbhar Bharat". Also, mention challenges in this regard.

According to UN migration report, India has largest diaspora. Top destinations are UAE, U.S.A and Saudi Arabia.

Role of diaspora in Making Atmanirbhar Bharat

1) Source of Income

[ECONOMY]

[DEMAND]

- ↳ Remittances (approx. USD 80 billion (2021))
- ↳ employment to skilled labour.

2) Technology and innovation source

[INFRASTRUCTURE]

- ↳ Diaspora brings exposure and technology.

[ex] New manufacturing techniques. [Make in India benefits]

3) Soft Diplomacy to pursue sovereign interests.

[ex] India - UAE investment agreement such that it promotes national interest.

Challenges in tapping potential of Diaspora

- 1) Increased Polarisation and Negative perception among host countries.

ex: Xenophobic tendencies in U.S.A., Protests in Western Europe to curb in-migration

- 2) Domestic (VISA related) policies, protectionism.

ex H-1B visa policy of U.S.A.

- 3) Brain-Drain: Often skilled labour force leaves country.

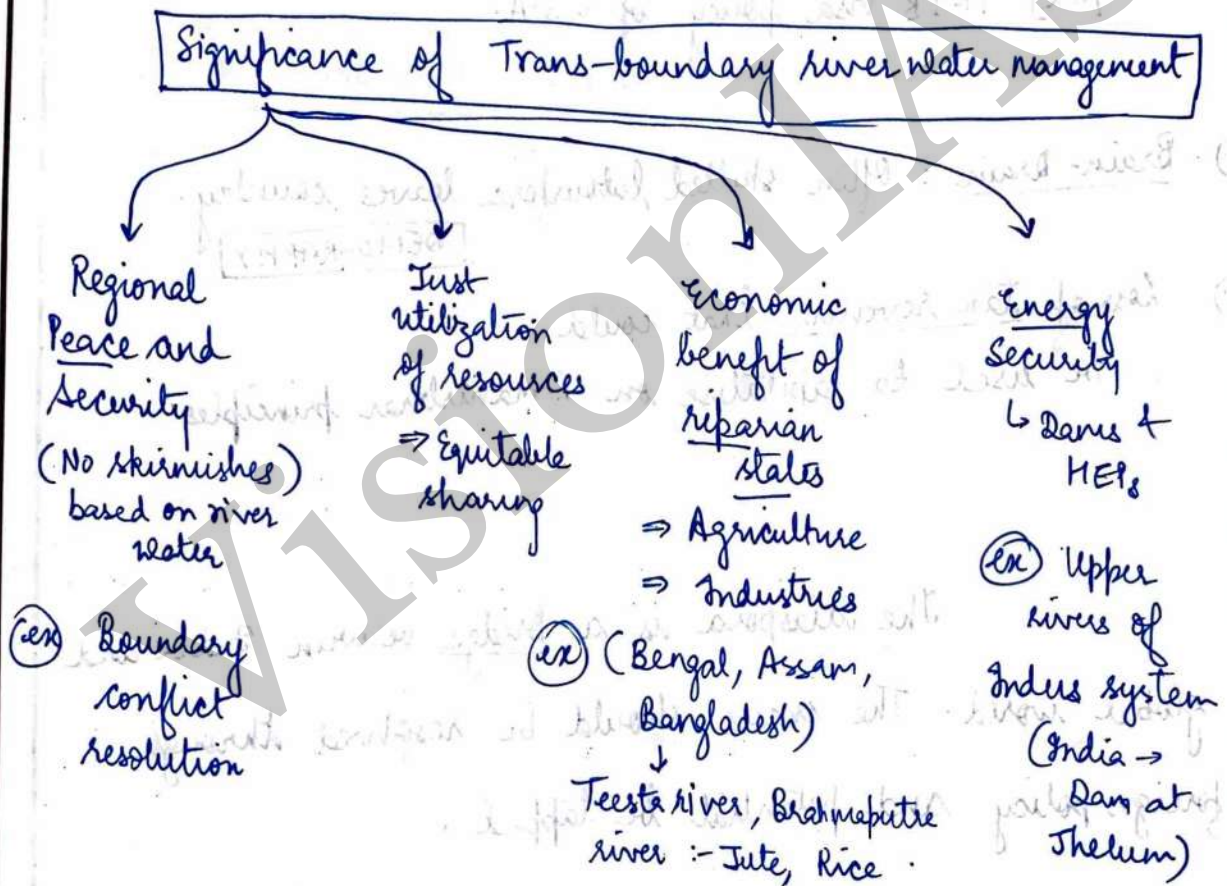
DEMOGRAPHY

- 4) Loss of tax revenue that could be used to capitalise on Atmanirbhar principles.

The diaspora is a bridge between India and global world. The issues should be resolved through foreign policy and potential be tapped.

3. Stating significance of trans-boundary river water management for India, discuss emerging issues in this context.

Recent boundary conflicts (ex: Nepal-India in Limpiyidhura regions) have basis of river as boundary. The importance of river-water management has become more relevant.



Issues emerging due to trans-boundary river

- ① Natural increase/decrease in volume of water, river course shifts or river capture.
- (ex) Shift in course of river Kali - Dispute between India

and Nepal.

② Technological innovations have made large-scale hydro projects possible. Thus, concerns of lower riparian states

(ex) India's objection to dam in Tsangpo river.

③ Climate change has changed river regime.

So, management is more important to mitigate hazards (like floods).

(ex) India-Bangladesh: Importance of Brahmaputra to prevent floods.

④ Growing importance of Internal/International Water transport.

(ex) India-Bangladesh :- IBP → Ship from Bengal to Assam via Bangladesh.

The River as a resource has always been crucial for geopolitical and economic relations. The water should be managed sustainably for collective prosperity of sub-continental region.

4. UN Peacekeeping requires reforms to keep its operations fit-for-purpose. In this context, discuss challenges faced by peacekeeping. Also, suggest reforms to improve its operations.

With the increase in geopolitical tensions (territorial wars), climate change (refugees) and domestic instabilities (political/civil wars), the role of UN Peacekeeping forces (UNPKF) to ensure World Peace has become more relevant. But, the reforms are needed to make it more capable to deal with emerging challenges.

Challenges faced by UNPKF

- 1) Irregular financing mechanism
 - Funds are at the discretion of donor countries (U.S., UK)
 - No fixed mechanism
 - ∴ Limited capabilities

- 2) Non-uniform selection of regions (conflict-ridden).
 - ↳ no fixed criteria
 - ↳ alleged interference of powerful countries

Ex: Yemen war vs U.S. pressure.

- 3) Infrastructural constraints 
 - Protective gears
 - Housing
 - Transport & Communication

- 4.) Technological backwardness
→ Cybercrimes, robots, CBN weapons are not effectively dealt with.

Reforms needed

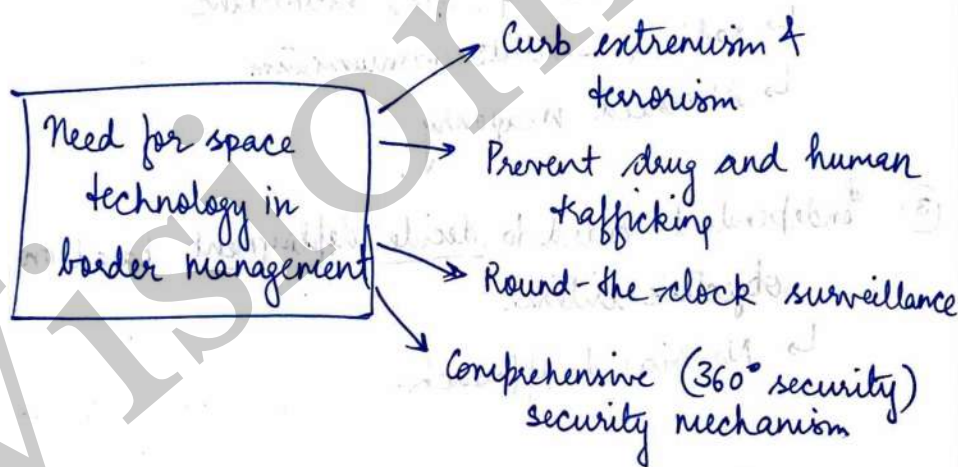
- ① Proper funding mechanism : Fixed % for infrastructure.
↳ UN countries should contribute } suggested by UN REFORMS Commission.
- ② Latest technology upgradation
↳ Remote-sensing, GIS, surveillance
↳ Radio & Satellite Communication
↳ Advanced weaponry.
- ③ Independent board to decide deployment based on objective criteria.
↳ No biased approach.

With global commitment, the efficiency and effectiveness could be increased. UNPKF are important and their capabilities should be enhanced.

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5. Discuss the role that space technology can play in strengthening India's border security.

With the emergence of new threats, the security mechanisms also have to be evolved. The defense mechanism should keep pace with technology and space technology is one such tool to strengthen border security.



Role of Space Technology

- ① Data collection and border imaging. (Remote-sensing)

ex Use of satellites to capture real-time images.

↓
Check infiltrations

- ② Surveillance 24x7

ex night surveillance.

- ③ Secure inaccessible regions, like rough terrain & mountain topography.

Ex: Satellite could be used for surveillance in Karakoram range.

- ④ Advanced and accurate fencing : Equipped with GPS technology.

Weapon → use of GPS to increase accuracy.

- ⑤ Satellite Communication : Uninterrupted coordination of means of security.

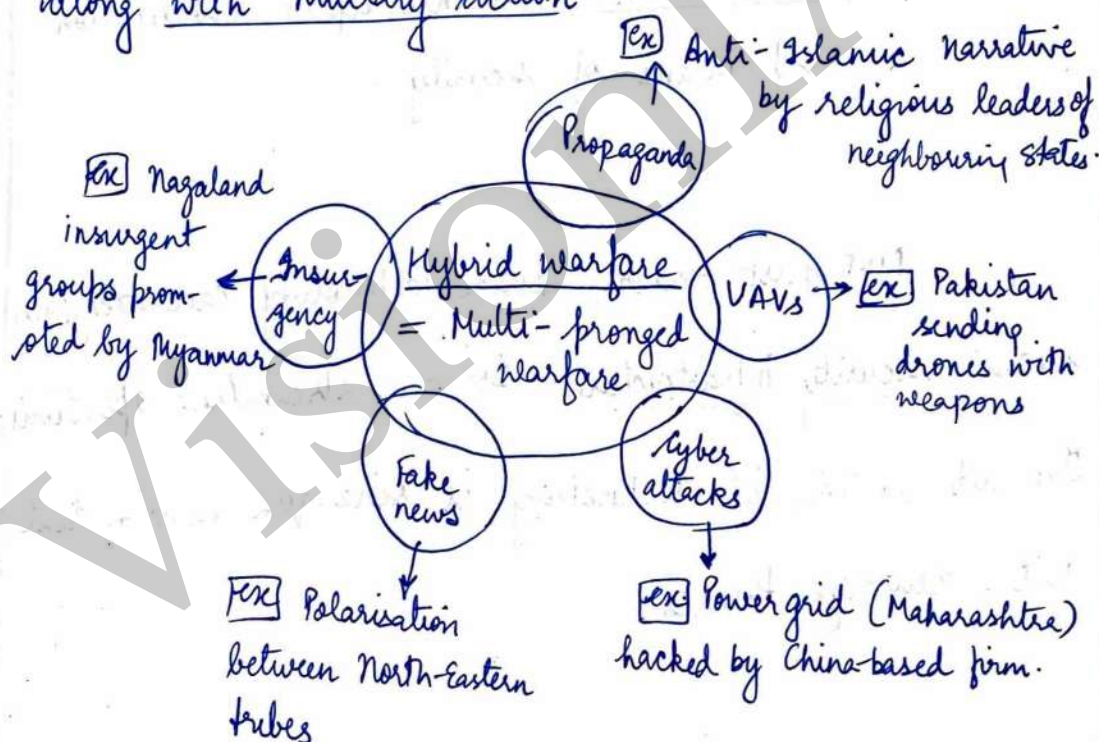
Not just borders, Space Technology can strengthen overall security infrastructure. It can streamline operations.

The upgradation in technology is sine qua non to deal with new-age threats.

6.

What do you understand by hybrid warfare? Discuss India's preparedness in this context.

Hybrid warfare is the new type of strategic warfare launched on multiple fronts at the same time. It ~~can~~ involves unconventional methods like 'Non-state Actors', use of Technology (A.I., Drones) and propaganda along with military action.



India's Preparedness ⇒ Developing Capabilities

① DRDO :- Technological R&D

↳ New tests like HELINA

↳ Corner Shot Weapon System CSWS

- ② Government's efforts to 'Make in India—Defence' for 'Atmanirbhar Bharat'
- ③ Cyber security mechanisms → CERT-IN
→ I4C } Ministry of IT
→ Cyber Swachhta Campaign
- ④ Technological adoption to curb fake news and address propaganda.
- ☐ Social Media handles
 - ☐ Machine learning tools to detect misinformation.

Though security apparatus is striving to achieve preparedness, there is a need for continuous improvement.

The hybrid warfare is too complex and requires a multi-pronged strategy to cut its branches.

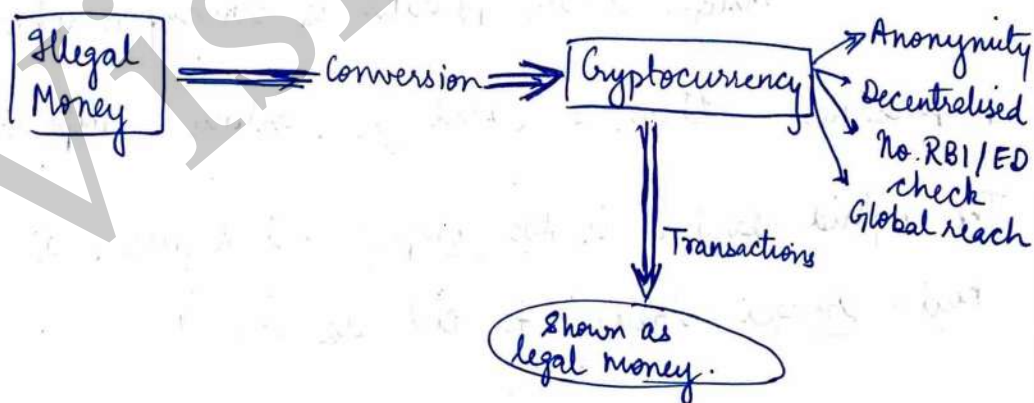
7.

Discuss how cryptocurrencies can become a tool of money laundering in India. Also, highlight steps taken by government in this regard.

Money laundering is the process of moving illegally acquired money so as to make it look legal.

Already a complex nexus exists, the rise of technology like Encryption, Digital transfers and Cryptography has further aggravated concerns.

Cryptocurrency as tool of Money laundering



→ Cryptocurrencies are outside regulation purview of RBI or government.

Thus, laundering route for money is easy.

→ Anonymous nature of transactions : Reduced chances of being caught.

→ Easy availability of Cryptos.

Steps taken by government

- 1) RBI guidelines to banks to curb cryptocurrencies.
- 2) Digital tax - 30% on every online currency transactions.
- 3) Mooting idea of CBDC.
- 4) Global cooperation → Dialogue with like-minded nations
→ Call for global action (FATF).
Ex Switzerland
- 5) PMLA (Amendment) to keep pace with emerging trends.
(Prevention of Money Laundering)

Money-laundering is a complex issue. It requires cooperation at regional and global level to be dealt with. It generates cycle of terrorism thus its networks have to be severed.

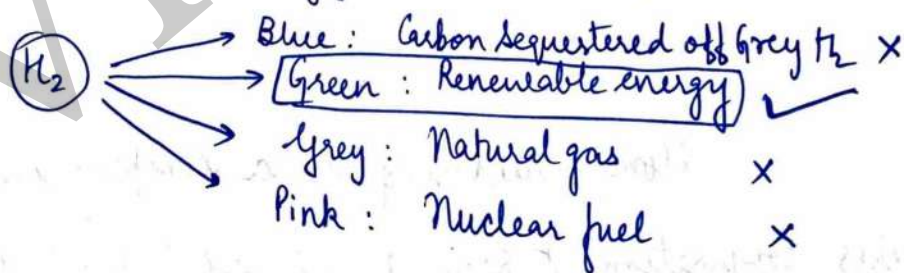
8.

To display its commitment to achieve net zero emissions, India has incentivised production of green hydrogen. In this context, discuss prospects and challenges of a green hydrogen economy.

'Panchsheel goals' enshrined during COP26 at Glasgow and 'Paris goals of NDCs' require the transformative adoption of renewable energy. Green hydrogen is one such potential area of investment to achieve net zero by '2070'.

Prospects of Green Hydrogen Economy

(1) Abundance of Hydrogen and India's potential for renewable energy to make it green.

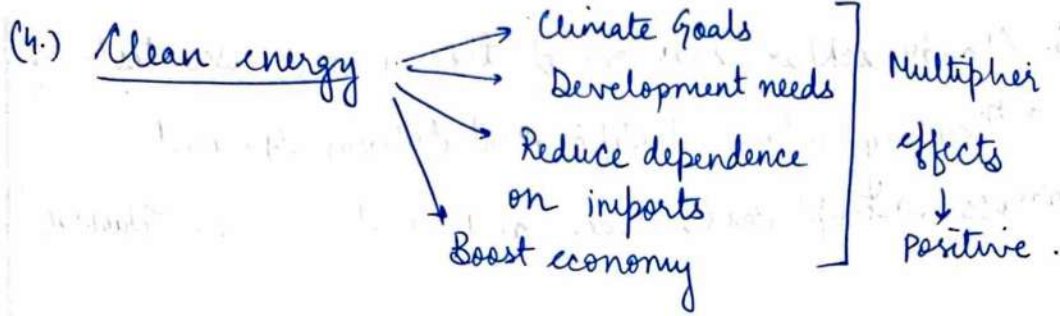


(2) High availability of surplus renewable energy to use for H_2 extraction.

[Not yet integrated to grids]

(3) Availability of private sector capabilities

Ex Reliance's Green energy policy.



Challenges

- Storage of Hydrogen : Inflammable (highly pressurised)
↳ huge storage infrastructure costs
- Cost of production : Per capita is high.
- low advancements / nascent stage of technology of extraction.

Potential of green Hydrogen economy is huge. It has to be tapped with a strategic policy. It can help bridge our difficult path to Sustainable Development in accordance with SDG-13 (Climate change) and SDG-7 (Clean and green energy).

9. S. Chandrasekhar was one of the greatest scientists of 20th century whose prolific contributions spanned across astrophysics, space and mathematics. Elaborate

S. Chandrasekhar, one of the scientists who gave valuable knowledge to apply, has made our understanding of space and Maths more enriched. He achieved Nobel prize for his contributions.

Contributions of S. Chandrasekhar

Astrophysics

→ He gave Chandrasekhar limit ^{known as} _{after his name} $\Rightarrow = 1.44 \text{ times Mass of Sun}$.
for a star to turn into a neutron star.

If star very heavy ($> 1.44 \text{ Mass of Sun}$)

↓
White dwarf (unstable)

↓
Supernova (explosion series)

Mathematics

→ Showed interest in dealing with large and complex numbers.

Physics

→ 'How stars develop and die' was explained
by Chandrasekhar.

In his memory, NASA also has a 'Chandra
X-Ray' observatory as a tribute to the great
scientist.

10.

India's lunar missions, besides attesting to the development of space technology in India, have contributed significantly in exploring lunar surface. Discuss.

India's lunar missions like Chandrayaan (I)(II) and are a testimony to Indian Space Research Organisation's (ISRO) capacity to develop space technology. Along with this, the lunar missions have enriched our understanding about Moon.

Contribution of lunar Mission

- ① Has detected samples of water on moon.
- ② Captured images of lunar surface
↓
Helpful to know relief, landscape, topography and other structural aspects.
- ③ 'Pragyaan' Rover has captured real-time data about moon's ~~atmosphere~~ surface.
- ④ It will help us understand evolution of Earth also.

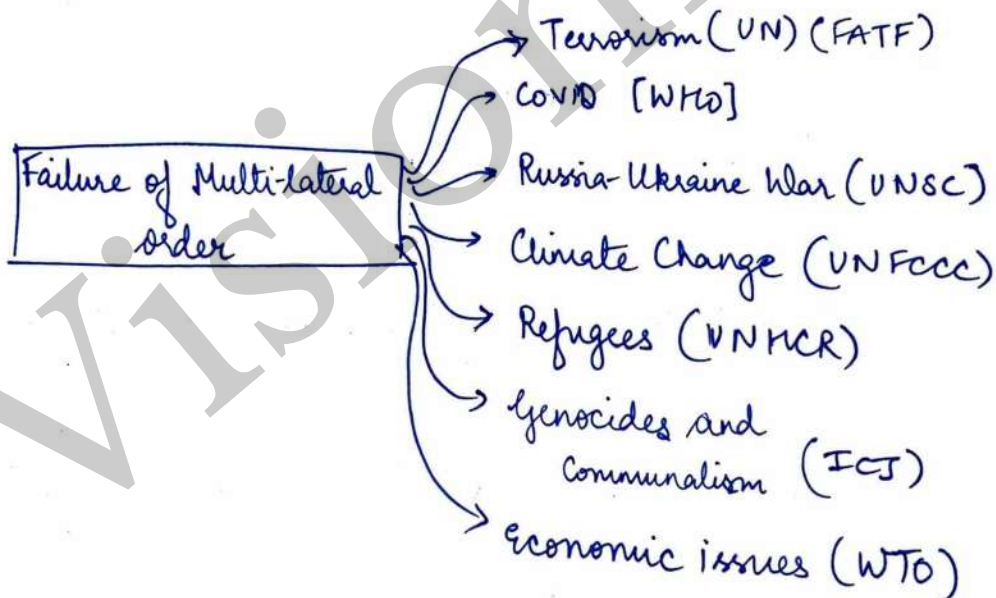
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Much more needs to be understood about lunar surface. For this aim, ISRO has 'Chandrayan-~~III~~' mission lined up for next year.

11.

There have been arguments with old global multilateral order failing to manage rising challenges, issue-based coalitions are gaining traction and have become arenas of functional cooperation. Discuss.

Russia-Ukraine War and COVID-19 pandemic have become watershed moments in world politics to depict failure or ineffectiveness of 'Global Multilateral Order' (Here, UNSC and WHO, respectively).



Rise of Issue-based Coalitions

1) Economic coalitions to meet complementary challenges.

[ex] RCEP for Asia-Pacific region
AAGC (India & Japan), OPEC.

2) Military Cooperation has become more regional.

[ex] AUKUS (Indo-Pacific)
NATO (To check Russia)

3) Geostrategic coalitions to deal with specific issues

[ex] Quad (to counter China)
ASEAN (South-East Asia's cooperation)
BIMSTEC (Strengthen ties among Bay of Bengal littoral states)

4) People-to-People ties and trade linkages.

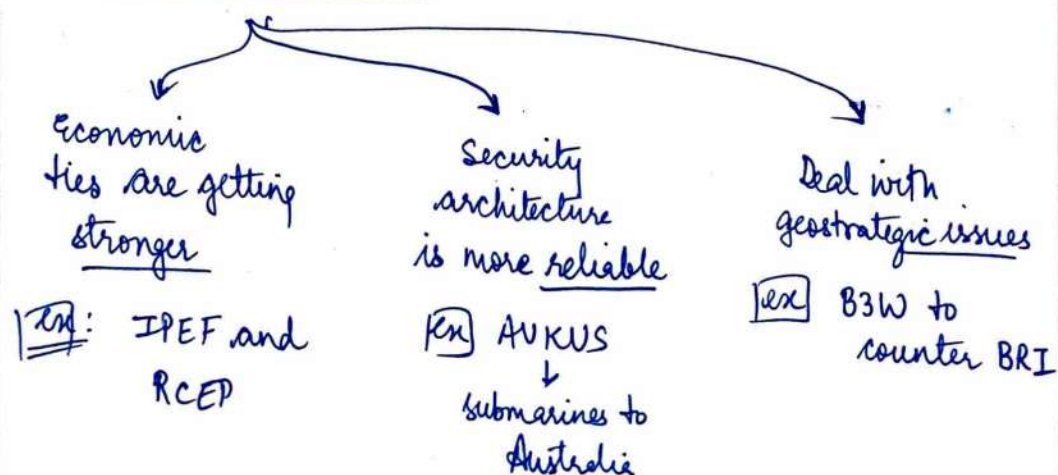
[ex] Middle-East Quad

5) Security pacts at regional level.

[ex] AUKUS, ~~SAARC~~ SCO dialogue on extremism

6) Climate-related pacts [ex] One Sun-One Grid, CQRI.

These issue-based coalitions have become arenas of functional cooperation.



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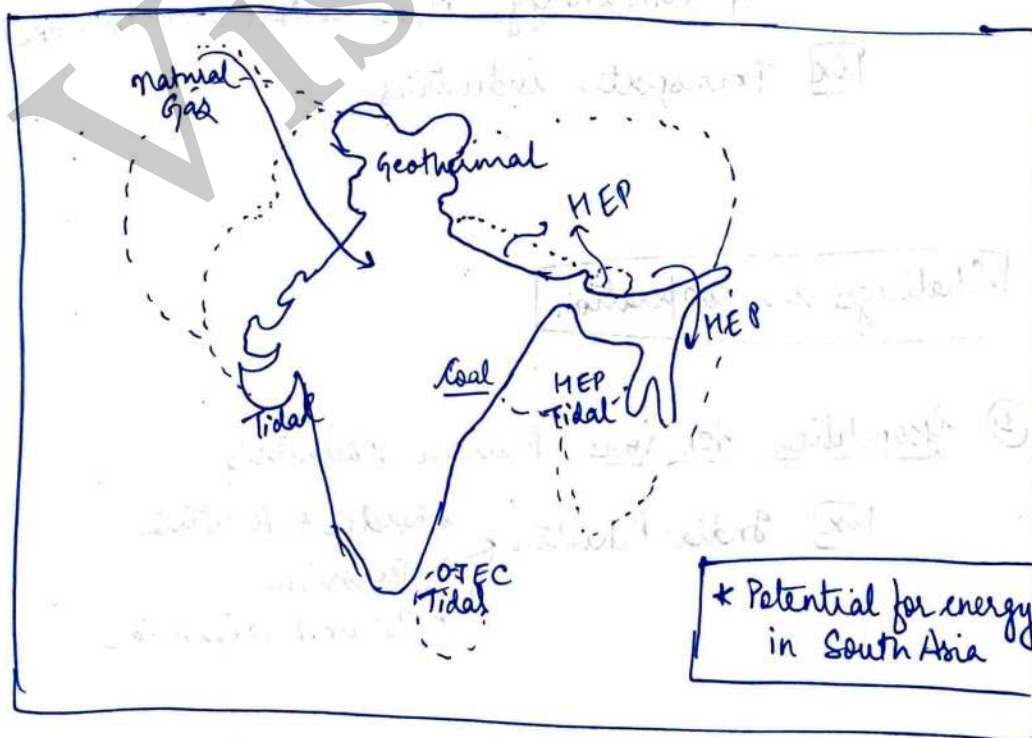
But, the relevance of multilateral order cannot be altogether negated.

It's importance continues to deal with global issues like Terrorism, Climate Change and Economic integration.

The need of the hour is reforming global bodies (like WTO, UNSC, ICJ, etc.) to make them effective in dealing with contemporary challenges.

12. India intends to achieve a balanced and optimal development of energy infrastructure in South-Asian region through mutual understanding and cooperation. In light of this statement, discuss need as well as existing gaps in South Asia's energy cooperation.

Climate-change mitigation, economic development and social security requires energy as a vital element of progress. To strengthen energy security at regional level, India aims for robust infrastructure in South Asian region. This is possible through mutual cooperation as energy resources are dispersed.



Need of energy cooperation

Energy

↓
Part of Security

① Energy Security

↳ Reduce dependence on Middle-East & U.S.A for fossil imports.

② Utilise resources optimally

[ex] ^{uranium} Resources in Afghanistan

↳ R&D to explore new resource-regions.

③ Regional prosperity → Bring regional security.

↳ Will bring social stability and peace.

(Reduce extremism)

[ex] Pakistan's chaos/riots due to inflation.

④ Economic linkages

↳ Along with energy, other sectors will be linked.

[ex] Transport, industries.

Challenges in cooperation

① Geopolitical tensions between countries

[ex] India-Pakistan

- Border & Territorial
- Terrorism
- Political dissensions

② River water disputes → hampers HEP projects

[ex] Brahmaputra (India-Bangladesh).

③ Political instability → lack of consensus on policies

ex Politics in Nepal, regime change in Afghanistan

④ Infrastructure and Capital constraints

↳ Technology, investments, funding and connectivity issues

Despite challenges, the scope of South-Asian Energy Cooperation is huge and beneficial. India should leverage potential by anchoring combined efforts of neighbouring countries.

13.

Not only is the Indo-French bilateral relationship the key for unlocking the synergies with the European Union but it is also crucial for a sustainable and stable world order. Do you agree?

India's bilateral ties with France are part of larger relations with Europe, not dependent on other ties. India and France are natural partners due to democratic setup and civilisational ties. They entered into a strategic partnership in 1998.

Importance in unlocking synergies with European Union

(1) Energy partnership → Renewable energy and technology partnerships could be tapped.

ex Paris Climate Deal → goals achievement
↓
Positive feedback in relations

(2) Defence relations → Imports of weapons

ex Rafale jets

↓
Could be expanded to
other EU nations (U.K., Germany, Austria)

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(3) Cooperation at global platforms like UNSC, UNFCCC, WTO.
(France = veto power)

(4) Regional development initiatives like in Africa and
Climate mitigation efforts. (International Solar Alliance).

Importance for stable world order

(1) Promote cooperation in anti-human activities like
terrorism.

↓
Share of Information & Technology.

(2) Military cooperation can help build deterring effect
to reduce escalation of conflicts. & Defence Modernization

[ex] Exercise Garuda (air force)

↓
[ex] Rafale

(3) Cooperation in space technology

[ex] TRISHNA satellite

(4) Cultural cooperation can foster global peace.

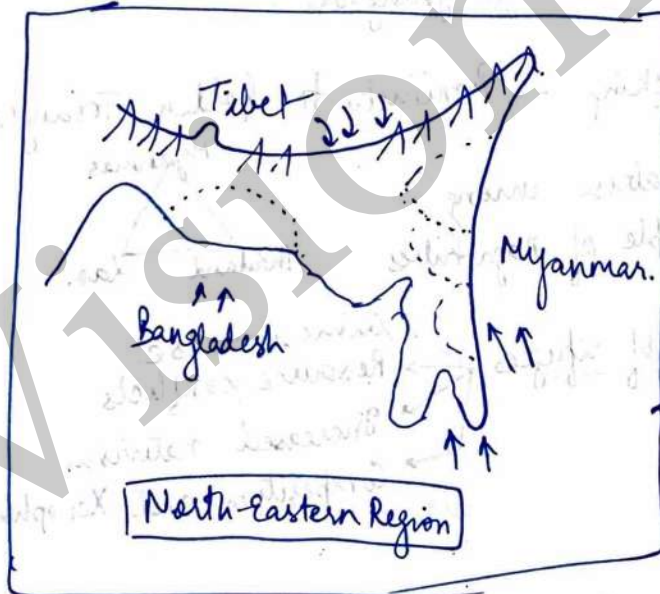
[ex] Celebration of Yoga Day.

However, there are challenges like 'connectivity' due to distance and growing polarisation within politics and society.

Both India and France should come together to turn cultural and democratic ties into a deep alliance for economic and security gains. This will have spillover effects for global peace.

14. A mix of internal and external factors poses security threats in North-East India. Discuss. What steps has the government taken to maintain peace and stability in the region ?

A region with multitude of ethnicities, linguistic forms and cultural traits and tribal economy is vulnerable to external and internal threats. The geographical location also makes it a sensitive place.



• Internal threats

- (1) Rise of secessionist tendencies. → Gives rise to movements against government.

[ex] Demand for greater Nagalim

- (2) border conflicts between states.

[ex] Assam-Meghalaya, Assam-Mizoram.

(3) Ethnic conflicts and tribal wars between heterogenous tribes. ↓

[ex] Bodoland issue

generally on resource distribution

[ex] Garo and Jaintia tribes.

External threats

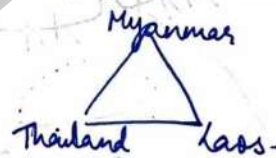
(1) Imported extremism and terrorism.

↳ Anti-social influence of regional countries.

[ex] Myanmar's secret group induce terrorism among Mizo youngsters.

(2) Drug trafficking — Proximity to Golden Triangle

[ex] Drug abuse among people of Naga tribes



(3) Infiltration of refugees

- Crime increase
- Resource conflicts
- Increased nativism
- Competition and Xenophobic tendencies

To address the above threats, government has taken following MEASURES.

• INSTITUTIONAL

- North-East Council : To promote cooperation.
- PESA act extended to Fifth and Sixth Schedule Areas.
- NCSC and NCST to address people's grievances.

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→ Committees to resolve internal issues.

Ex Bodo Accord
Pact with NSCN(IM)

INFRASTRUCTURAL

Border

- Increased Surveillance
Ex Satellite, drones deployed
- Electric fencing
- Night vision cameras
- Real-time data analysis

Social

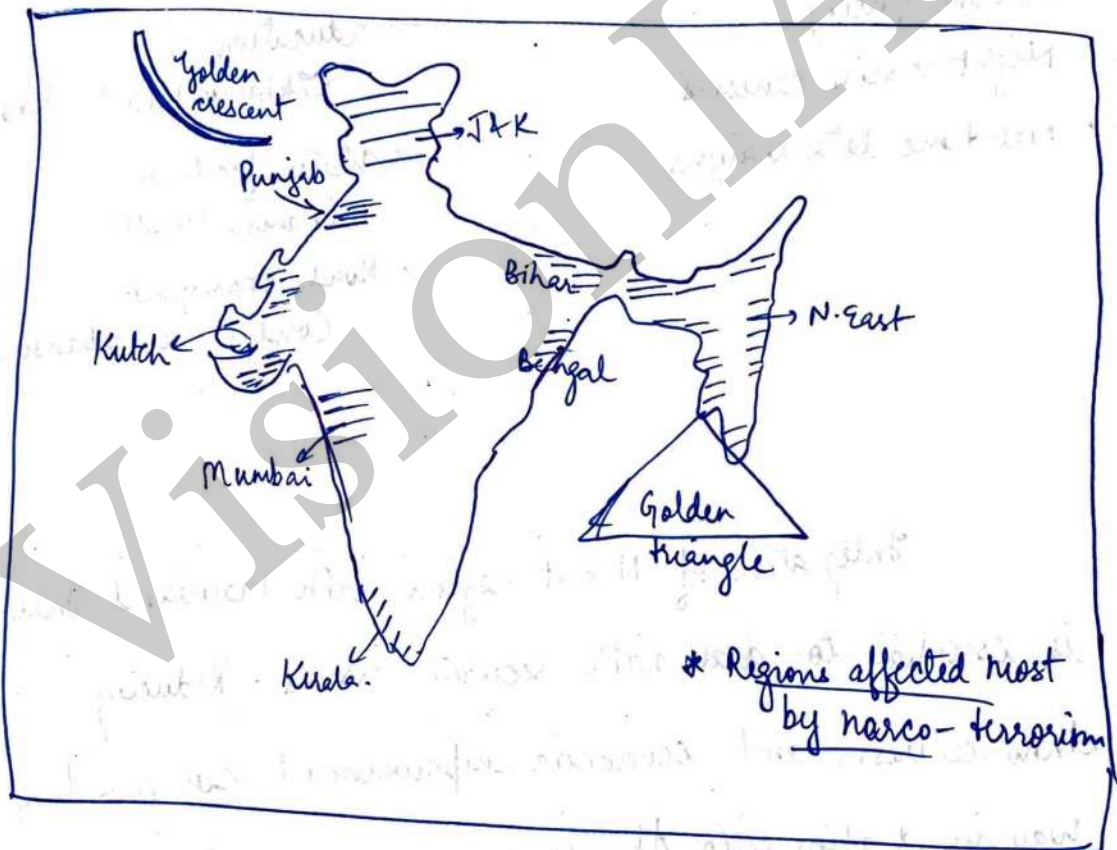
- Health institutions
(Proposal for AIIMS)
- Education
(Eklamya Model, KVs)
- Water facilities
(Dams, canals)
- Road, transport
(bridge over Subansiri)

Integration of N-East region with mainland India is essential to deal with security issues. Reducing ethno-centrism and economic empowerment can go a long way in dealing with threats.

15.

Discuss the extent of problem of narco-terrorism in India.
What measures have been taken by the government to counter and control this problem?

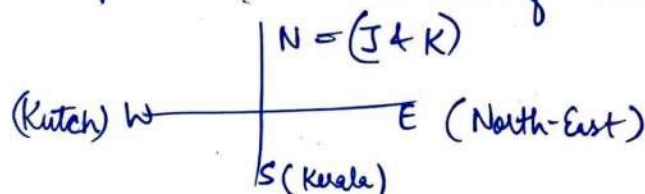
The advent of technology has enhanced ways of smuggling and spread drug abuse. The drugs and terrorism are two sides of same coin that re-inforces each other.



Extent of Problem

⇒ HORIZONTAL extent > effects about 20% of total area.

↳ Spread to vast corners of India



UPSC

Question No.
प्रश्न संख्या

→ More concentration in border regions
(effect of Golden triangle and Crescent)

⇒ VERTICAL extent

↳ Targeting of youths (Drug abuse and Juvenile delinquency at rise in major states)

↳ Peers are more vulnerable
(50% peers prone to risk)

↳ Women's involvement has also seen a rise in recent times.

Government's efforts

INSTITUTIONAL

→ Signatory to
UN Convention
of Drugs and Psychotropic
Substances

Border
security

NPS act, 1985

{ To Reduce prevalence
of drug }

SCHEMES

Nasha-Mukt
Bharat Campaign

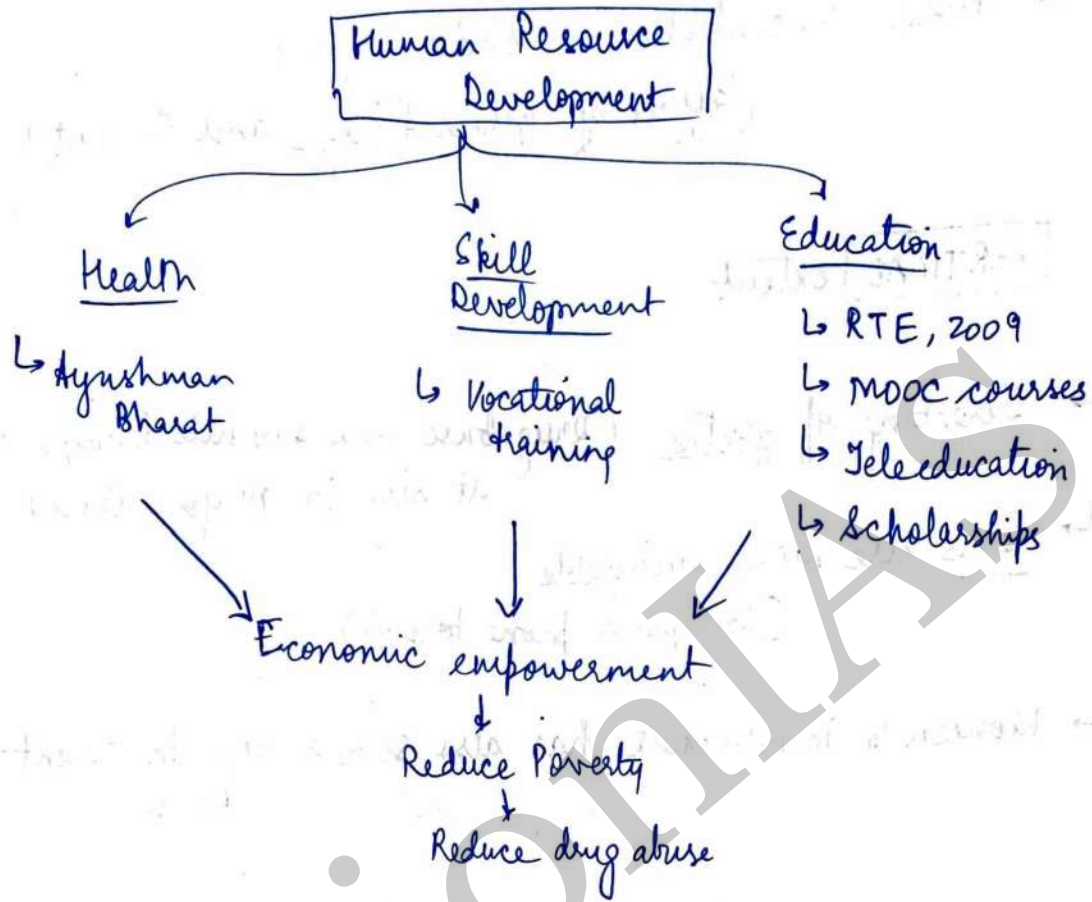
↳ Centres to reduce
addiction

↳ Awareness campaigns

Prevention of Alcoholism and
Substances Abuse

↓
helps Voluntary
organisations.

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With participation of civil society and political will, narco-terrorism can be reduced.
A multi-pronged strategy is the need of times.

16. In light of the increasing security challenges faced by India, state the need for achieving self-reliance in defence manufacturing. Also, discuss challenges in this context.

India faces internal and external security challenges. Recent border conflict with China has re-emphasized importance of self-reliance in Defence, whose part 'Manufacturing' is crucial.

Need for achieving self-reliance in defence manufacturing

1) Existing dependence on imports.

According to SIPRI, India is second largest arms importer.

↳ Dependence on suppliers of critical equipments.

Ex:- S-400, : Russia } U.S. Sanctions.
Mig 27

2) Save on foreign exchange and generate employment.

Ex:- Defence imports costs billions of USD.
'Make in India-Defence' could boost R&D and employment.

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3) Keep pace with evolving technology like A.I., IoT, cyber softwares, etc.

Ex DRDO's camera to look into multiple directions (corner)

4) Increasing geopolitical areas of tension

Ex China in North-East and Ladakh region
Pakistan in Siachen region.
Aggressive posture in IoT by China.

5) Cater to local or regional needs

↳ Build technology suitable to terrain, threat, climate, etc.

Challenges in Self-Reliance

(1.) Cost associated with Innovation

↳ Poor R&D culture (less than 1% of GDP in R&D)

↳ Fiscal constraints (Covid impact also)

↳ Compromise with welfare if huge cost of domestic manufacturing

(2.) Lackadaisical attitude of private sector

↳ Lack of incentive (the perception is such).

(3.) Infrastructural lacunae

↳ Manufacturing units, raw-material processing

units, transport and supply chain issues.

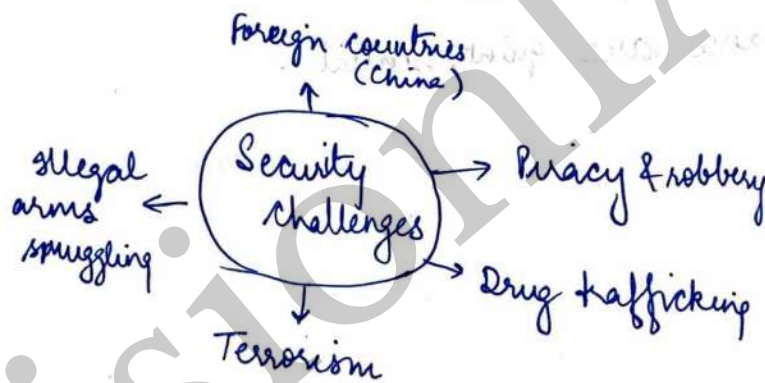
- (4) Near absence of critical materials like Semiconductor chips. (95% imported from China).

The challenges have to be overcome through sustained efforts by regional and national organisations.. Defence and Security is uncompromisable, where manufacturing and self-reliance are quintessential.

17.

India faces a number of security threats and challenges that originate from the seas. Discuss. Also, give an account of the initiatives taken to strengthen the coastal security of India in recent times.

Blessed with a long coastline of 7517 km, India has inherited few challenges alongwith. The maritime boundaries cause a number of security threats that needs to be addressed.



① Piracy and Robbery

↳ Shipments are hijacked and armed pirates threaten economic movements.

② Drug trafficking

↳ Easy escape routes and supply chains along coasts.

Ex Drug supplies via Mumbai port

③ Terrorism

↳ Infiltration via sea routes.

[ex] 26/11 attacks were ~~for~~ performed by terrorists that entered via sea.

(4) Arms smuggling → It provides supplies to internal fringe groups (ex: Militants)

(5) growing footprints of China's presence → Direct threat to ~~democracy~~ territorial integrity.

[ex] Hambantota Port (Sri Lanka) :- Just 12 km from Tamilian coast.

Initiatives taken to strengthen Coastal Security

① UNSC's presidency is used by India to open a 'Coastal and Maritime Security Dialogue'.

② 'Ocean Security Pact'

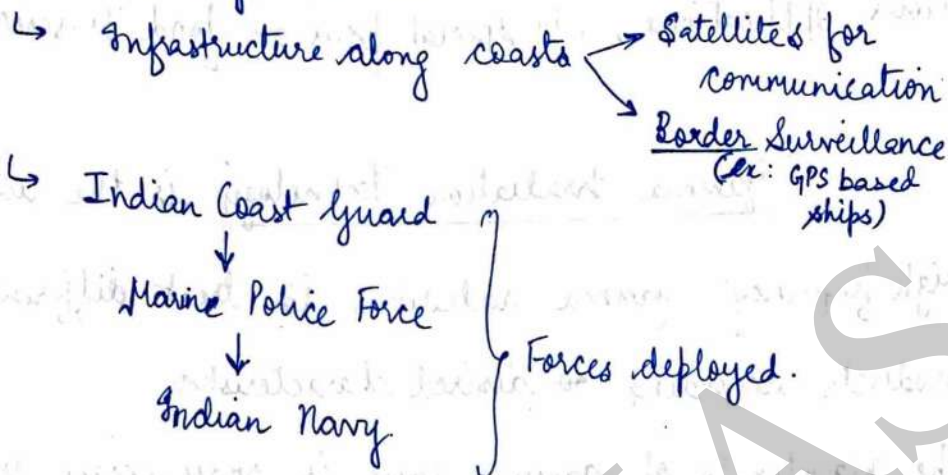
② Bilateral exercises to adopt best practices, joint military capabilities and improve operational strategies.

[ex] Malabar exercises (QUAD countries)

Exercise LAMITIYE (Seychelles)

India & France (P-81 deployment)

③ Border security initiatives



④ Community involvement along coast

[ex] Fishermen in Tamil Nadu to expose any risk.

⑤ Technological and security tools deployed at borders

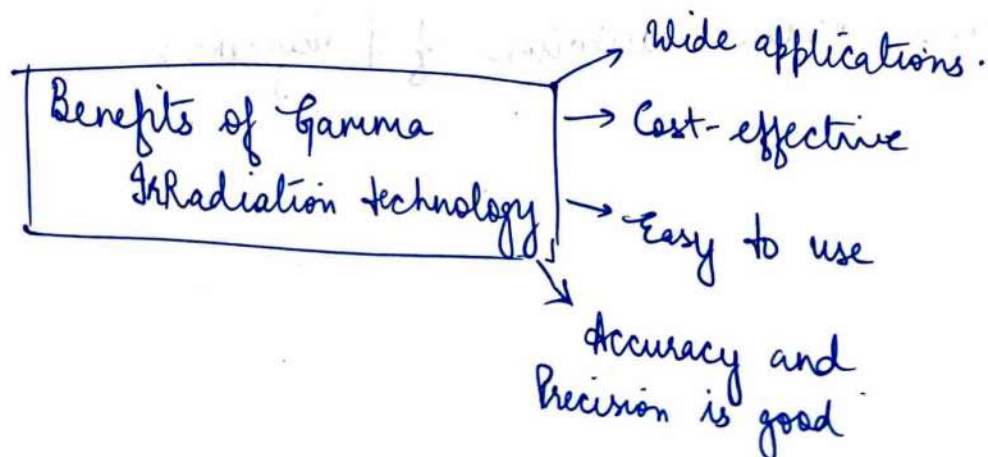
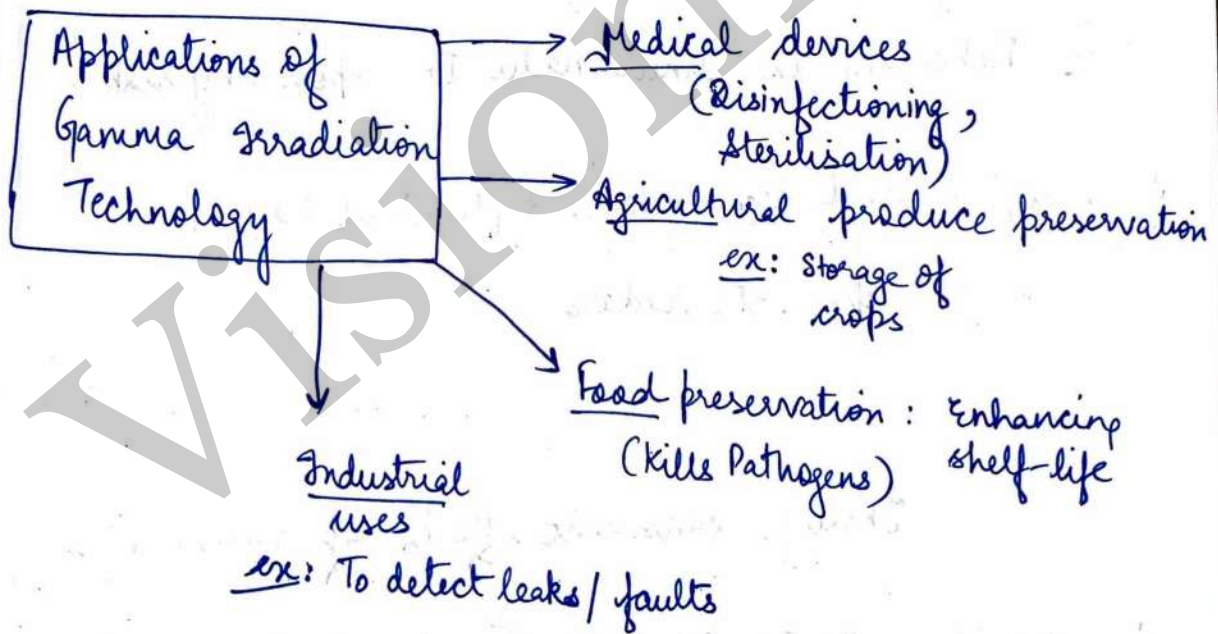
[ex] Ships with radars.

Through consistent efforts of government, the coastal security could be strengthened. The multifarious challenges demand attention of policymakers.

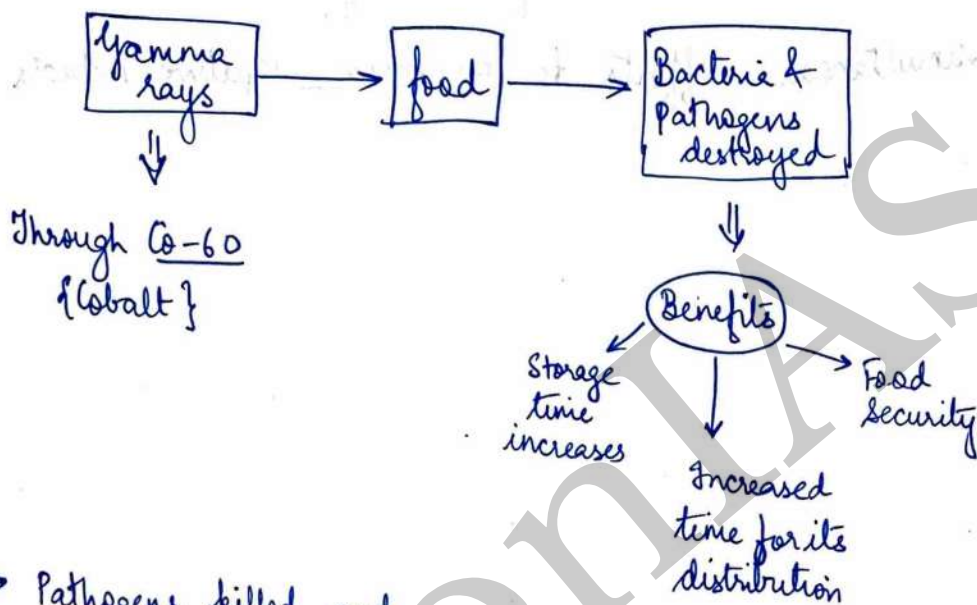
18.

What is Gamma Irradiation Technology? Highlight its various applications, with special focus on food preservation.

Gamma Irradiation Technology is the use of high-frequency gamma radiations to treat different products according to desired characteristics. The wavelength of gamma rays is very small and its able to penetrate objects.

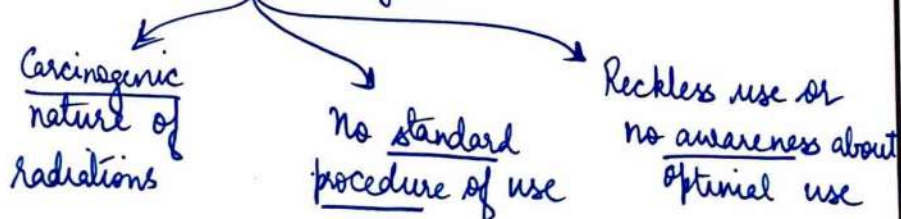


Use in Food preservation



- (1) → Pathogens killed and hence durability of food increased
- (2) Increases supply of food at far-away regions.
- (3) Food diversification is made possible
- (4) This in turn improves farmers' income. (Low wastage)
- (5) Enhances nutritional security and hence improves Social Indicators. (Health benefits).

But, there are certain challenges.



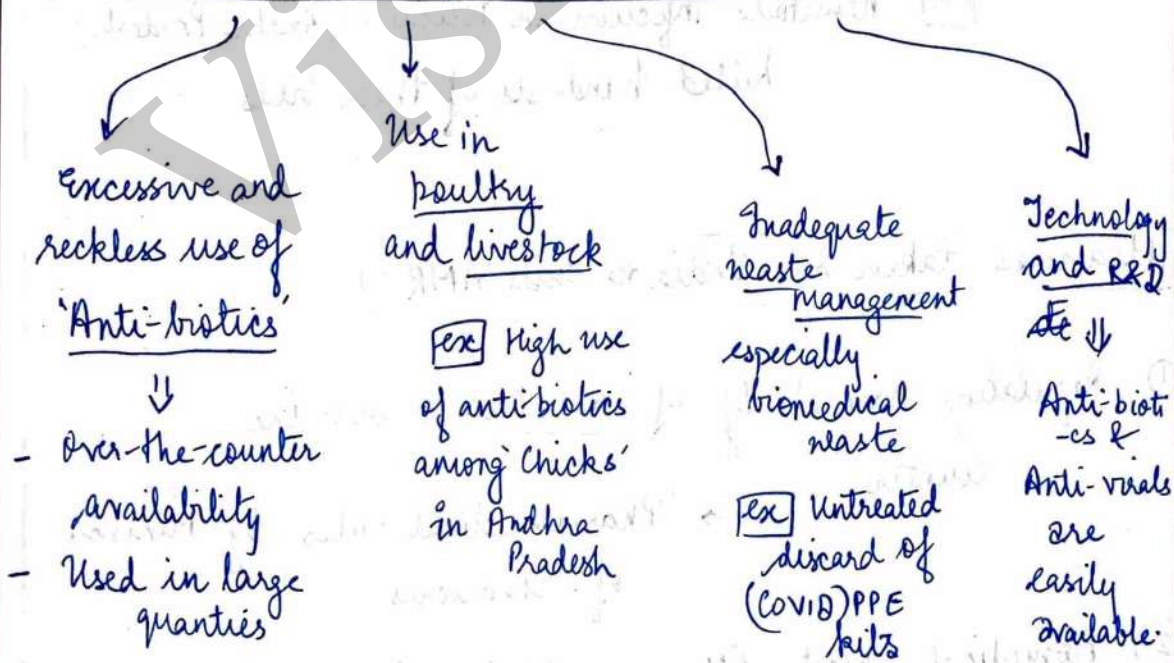
Any technology has its potential and limitations. The use of technology should involve simultaneous efforts to minimise negative impacts.

19. Recently, WHO has declared Anti-Microbial resistance (AMR) as one of the top 10 public health threats facing humanity. Comment. Also, discuss measures taken to counter this threat in India.

WHO's report on adverse consequences of AMR and top 10 public health threat should be an awakening call to curb the menace of AMR.

Recent COVID-19 pandemic has already highlighted inability of Health Systems to deal with health emergencies.

Reasons for High AMR prevalence



Effects of High AMR

- ① Ineffective treatment : No longer treatments will work. Bacteria evolution is so fast that drugs cannot keep pace with it.

ex Reports showing reduction in effectiveness of TB drugs.

- ② More widespread infections

↙
Cost on
healthcare

↓
Increased
mortality

→ Promote
inequalities
(induced by poverty)

- ③ Cost of developing new drugs

- ④ Threat to Wildlife

ex Nematode infection in Pelicans (Andhra Pradesh) killed hundreds of these birds.

Measures taken by India to curb AMR

- ① Regulating availability of Anti-biotics over the counter

→ 'Pharmaceutical Rules' by Ministry of Chemicals

- ② Biomedical Waste (Management) Rules

↓
Mandate incineration & safe disposal of medical waste.

③ Ban on drugs / infection controlling sprays for poultry and livestock.

④ 'One-Health' Approach as its model framework.

The community awareness program to curb AMR is significant. Government and citizens can together reduce adverse consequences of AMR. The scientific community should constantly innovate to meet evolving threats.

20. What are Hypersonic weapons? Highlight their significance and discuss challenges in their adoption and use.

Hypersonic weapons are advanced group of weapons that travel at Mach 5 [5 times greater than speed of sound] or more. With growing investments in technology upgradation, Hypersonic weapons have become the new trend. Ex. Kinzhal (used by Russia)

Significance of Hypersonic weapons

- 1) Accurate targeting : Due to lesser interruption, accuracy of hitting gets improved.
- 2) Mid-distance manoeuvrability : They could be changed in trajectory taken in mid-air.
- 3) Reduced chances of detection : Due to high speed and possibilities of detection are reduced.
- 4) Longer range : Can travel larger distances.

5) High speed saves time and ensures quickness in response.

Challenges in use

- ↳ It could lead to weapons race among countries.
- ↳ High cost of manufacturing
- ↳ Requires huge investments in R&D and maintenance of such weapons.
- ↳ Can disturb global peace and escalate small conflicts
- ↳ Drain on finances of government as private sector has insignificant presence.

The responsible use doctrine is a necessity in a polarised world order. Nothing more than deterrence should guide ~~the~~ possession of sophisticated technologies.