

प्रश्न संख्या
Question No.)

219319_613202_1910092878_(2023-08-17 23:59:32)

U.P.S.C.

इस भाग में कुछ
न लिखें
(Don't write anything
in this part)

Name - Shailputri

Batch - MUP + Cohort 13 Alternate

Roll number - 1910092878

Date - 17/8/23

Test - Sectional Test 4

Q.1)

STEM sector is the backbone of present day knowledge economy. Universities like IITs, IIMs, JNU etc have played a crucial role in making India a leader in knowledge economy.

Opportunities in STEM sector

a) Technologies that propel 4th Industrial Revolution relies on STEM. [Eg] - AI, ML, IoT etc.

b) Major role in fields like biotechnology, nanotechnology. [Eg] - India has 25% of world's nanotech workforce.

c) Presence of world class education infrastructure. [Eg] - IISc, Bangalore well known name in research.

d) Demographic advantage - 60% of India's population below 30 years of age. (UN FPA).

e) Presence of service sector. [Eg] - giants like Wipro, Infosys, TCS.

Need to democratise access to STEM

i) Poor research spending (Eg) - 0.7% of GDP. 6% in China.

ii) Gross Enrollment Ratio is 25% (Eg) - NEP aims to increase it to 50% by 2030.

iii) Women researchers just 16.6% of total R&D workforce.

iv) Infrastructure - Not a single Indian university in top 100 of QS Rankings.

Way forward

↓
New S&T policy - open and equitable access.

→ Increase R&D Spending (P.M-EAC recommends 2% of GDP)

→ Increase private sector participation. (Eg) - Economic Survey recommends it to ↑ to 70% from present 40%.

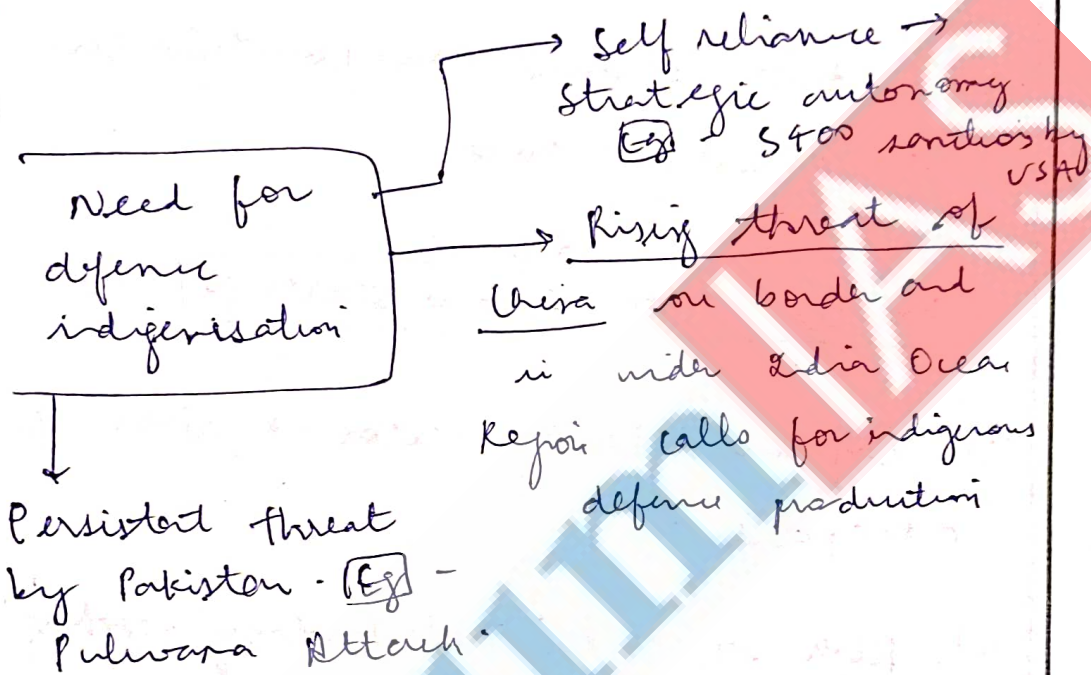
→ Institute of Business Shere - autonomy to universities

Need to ensure equitable access.

U.P.S.C.

Q.2)

According to SIPRI Report, India is 2nd largest arms exporter in the world.



Importance of startups in defence sector

- Complement PSUs like HAL, DRDO.
- New and emerging technology can be made. (Eg) - nuclear powered submarine technology.
- Job creation - to both skilled workers and semi skilled.
- Export - (Eg) - Philippines, Honduras etc are emerging markets.

U.P.S.C.

e) Reduce import bill . A huge chunk of capex is now spent on defence procurement.

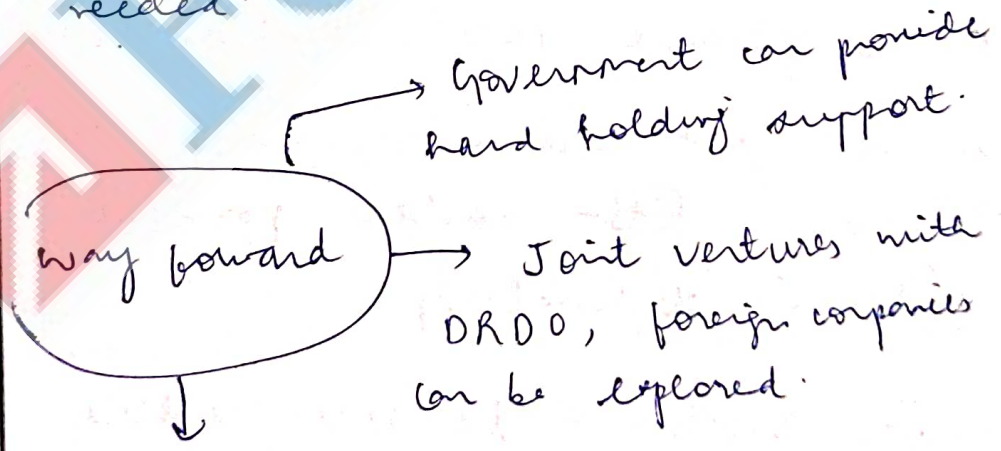
f) Reduce reliance on countries like USA, Russia, France.

Issues with ~~space~~ ^{defence} startups

i) Capital intensive sector → risks of monopolies.

ii) Risk of critical technology reaching malicious agents.

iii) Predictable policy environment needed.

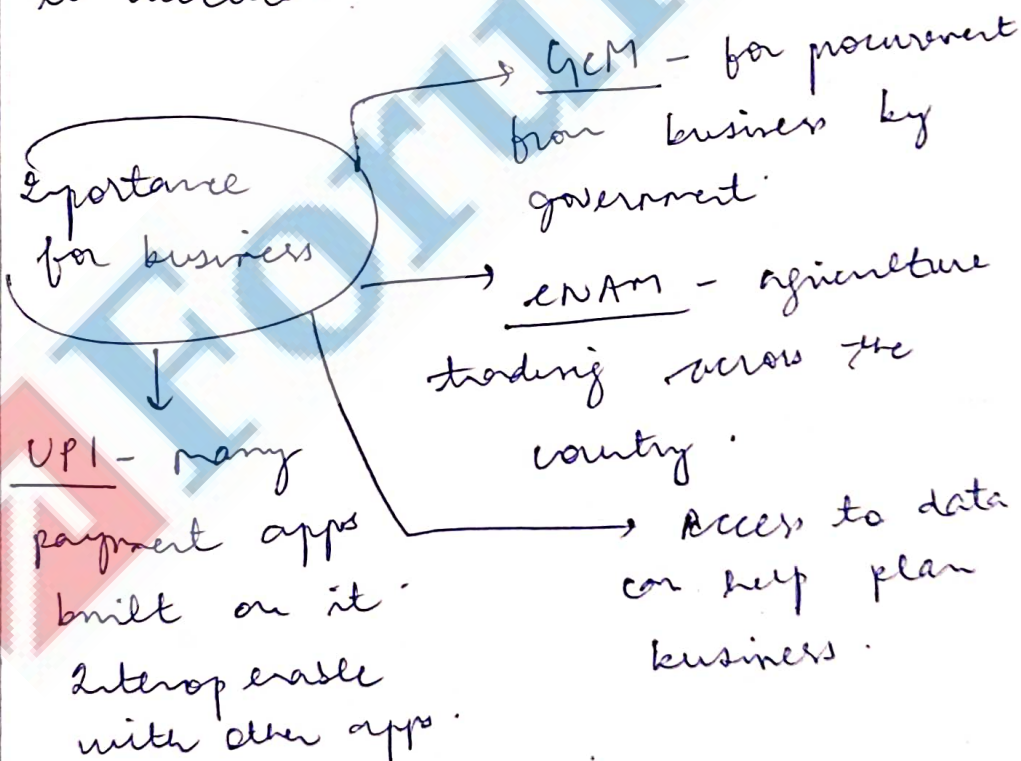
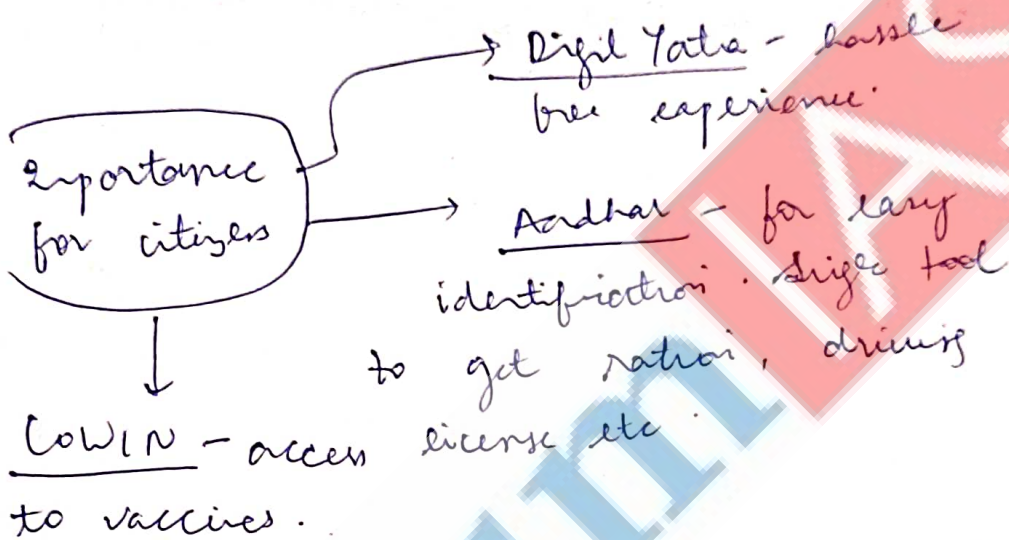


Make sure critical technology remains with government.

A balance between government and startups can serve India well.

Q.3)

Digital Public Infrastructure (DPI) refers to modern infrastructure that relies on computer and internet technology.



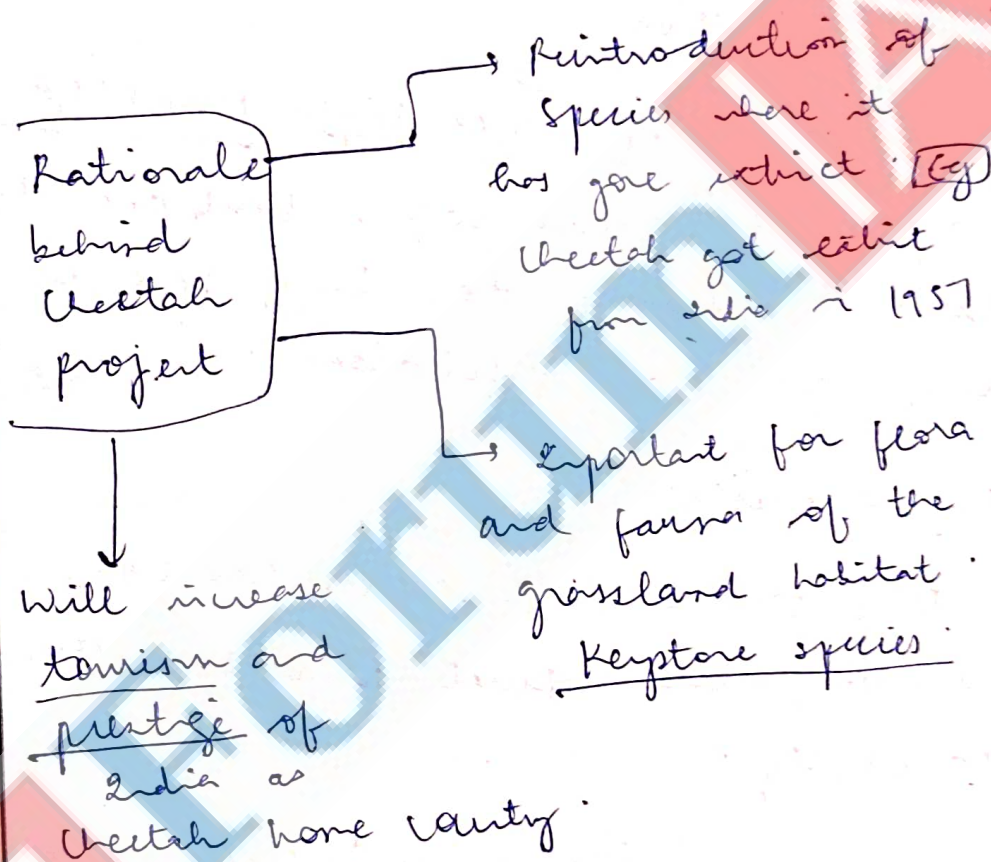
Challenges with DPI

a) Exclusion

Exclusion errors in Aadhar. (Eg) - denial

8.4)

Project cheetah is the project of translocation of cheetahs from Namibia and South Africa to India's Kuno National Park (MP).



Issues with reintroduction of major fauna

- a) more than 6 cheetahs in Kuno died due to cardiac and renal failure.

U.P.S.C.

- b) Homing - ability of wild animal to travel back to his home range.
- c) Co-existence of people must be taken into account.
- f) Ability of wild animal to survive and breed into new conditions and climate.

Cheetah reintroduction is departure from India's traditional conservation efforts because it is first time that an animal species has been translocated and reintroduced.

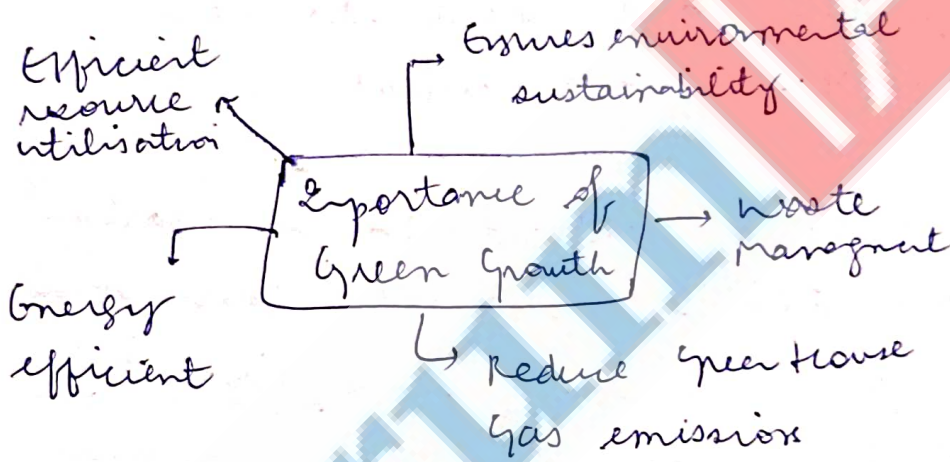
In this regard it is important to pay heed to IUCN species

Reintroduction Perspective -

- a) Proper studies must be conducted to know the viability of project.
- b) Continuous stress monitoring of translocated species.
- c) Co-existence with people must be ensured.

Q. 5)

Green Growth is the growth that takes into account ecological sustainability along with economic growth. [Eg] - Uttarakhand's Green GDP.



Initiatives for green-growth in Budget 2023-24

i) PM-PRANAM - for incentivising states to reduce fertiliser use.

[Eg] - fertiliser use responsible for ground water pollution in Punjab, Haryana.

ii) Anvrit Bharosa - for wise use of wetlands. [Eg] - wetlands

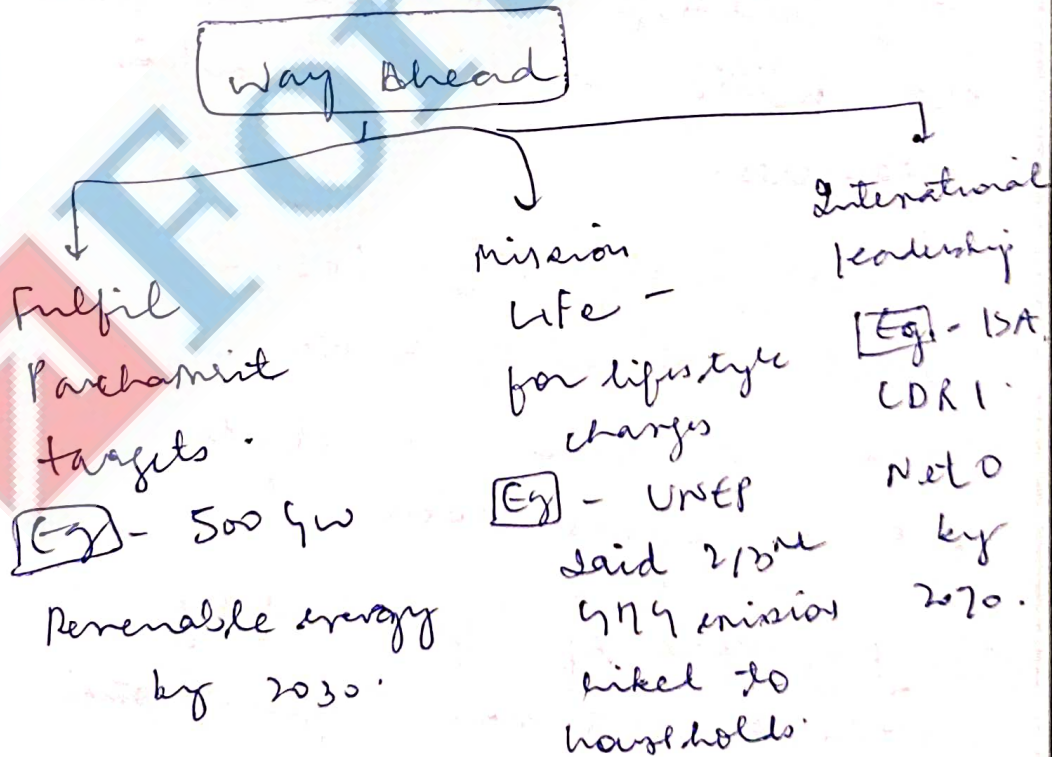
play important role in preventing soil erosion, land degradation, water purification.

iii) MISHTI - for mangrove conservation.

[Eg] - Sunderbans mangroves converted to shrimp farms.

iv) Green Hydrogen Mission - to reduce fossil fuels consumption.

v) Saptarishi targets - include green growth as one of 7 priorities.



All the SDGs are ultimately linked to environment. Important for New India @ 2047.

Q.6)

According to World Bank, 5% of Indian population will live in urban areas by 2050.

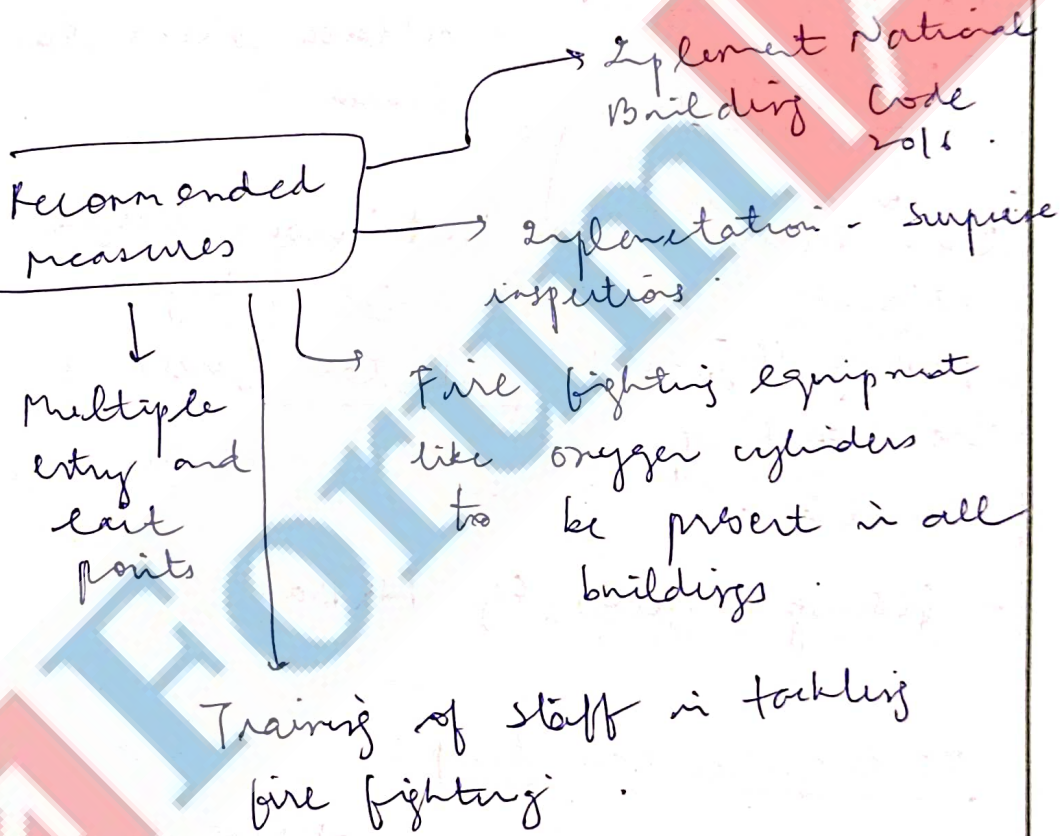
Unplanned urbanisation leading to fire hazards -

- a) Congested and cramped buildings leading to fire. [Eg] - Swat building fire.
- b) No infrastructure update. [Eg] - Many buildings more than 100 years old with no fire precaution measures.
- c) Overcapacity. [Eg] - Coaching institute fire in GTB Nagar, Delhi where more than 100 students sat in small room.
- d) Negligence of fire safety measures and non-implementation of laws.

U.P.S.C.

e) Industries coming up in residential areas. Ex - LG Polymers, Vizag was operating in urban residential areas.

f) Unplanned growth of cities leading to boundaries between commercial and residential areas blurring.



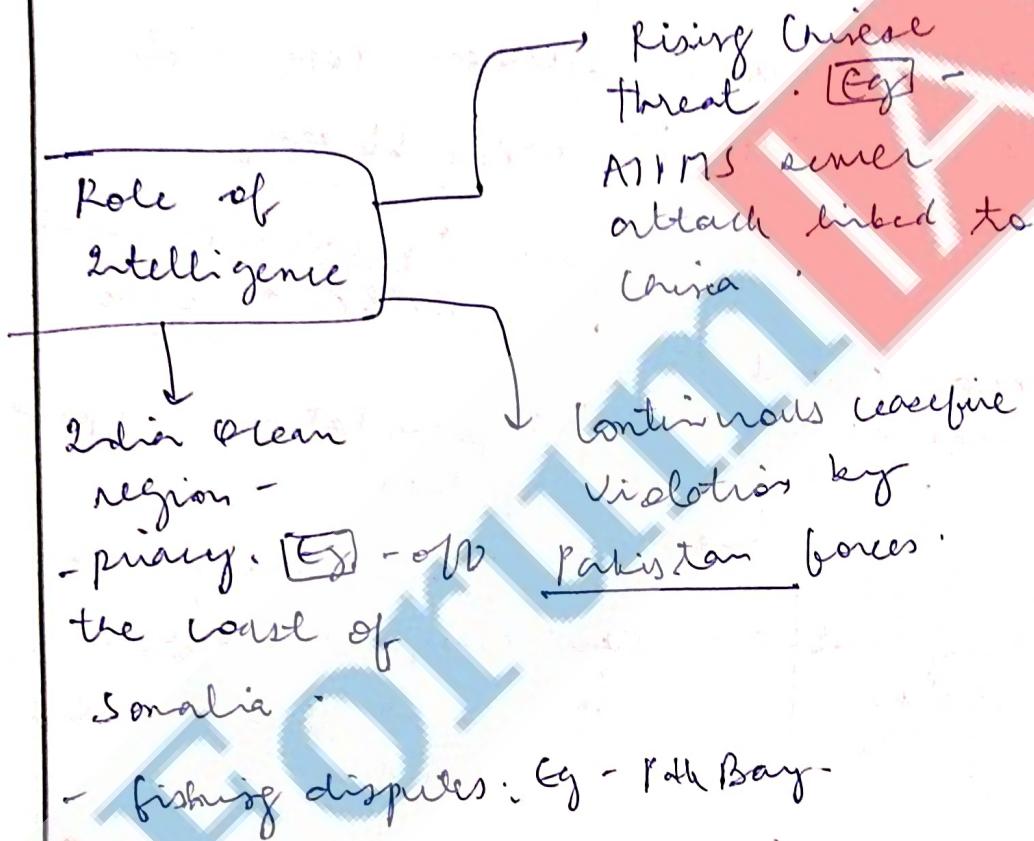
Further needed

- Effective law implementation.
- Frequent safety audits of buildings.
- Urban local bodies to cater to old buildings * Renewal and retro-fitting need preventive and curative measures both to prevent safety hazards.

U.P.S.C.

Q.7)

Intelligence is the ability to anticipate threat to security and neutralising it.

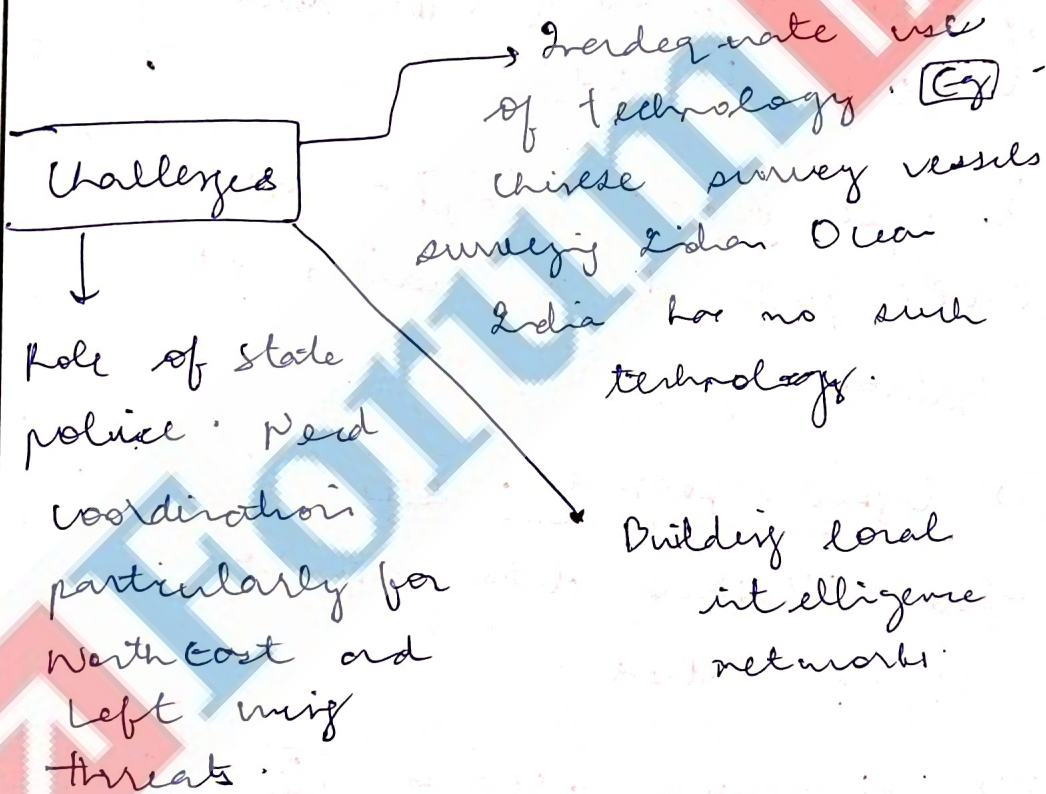


Intelligence can help in

- i) Timely detection of threats.
- ii) Mobilisation of resources to timely neutralise the threat.
- iii) Planning our move in advance. Pro-active rather than reactive approach.

iv) Timely evaluation of personnel or civilians. Eg - Evaluation before Russia-Ukraine war.

v) Preventing emergencies. Eg - Left wing emergency relies on local intel network. Forming an intel network can prevent it.



Way forward - In light of new and emerging technology like dark net, crypto currency; it is imperative that we up our game and make robust intel network.

Q. 8)

Cyber security threats are those hazards that emanate from modern computer and internet technology.

India is 2nd most vulnerable country to cyber security threats (NASSCOM)

Different kinds of cyber threats faced by India

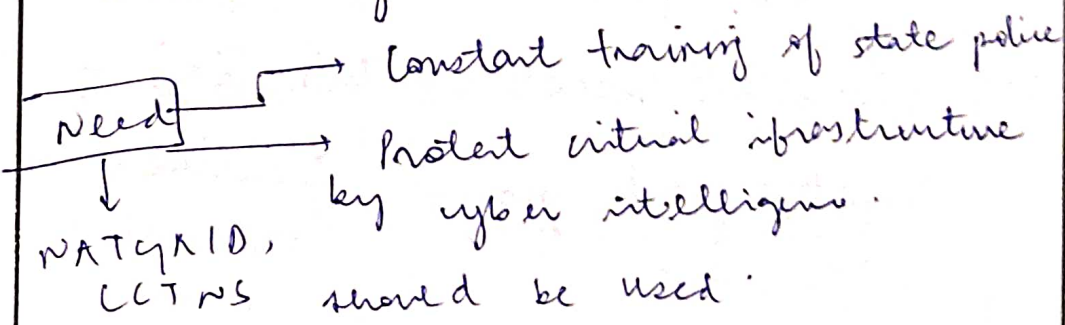
- i) Cyber attacks - [Ex] - Attack on INPT port during clashes at Galwan.
- ii) Cyber espionage - [Ex] - Chinese firm Zhenhua data monitoring (9) over Indians.
- iii) Ransomware attacks - [Ex] - Petya Ransomware.
- iv) Data leaks - [Ex] - Aadhar data of millions leaked online.
- v) Attack on virtual information infrastructure.

U.P.S.C.

- vi) Backdoor vulnerability. [Eg] - found in Huawei and ZTE components.
- vii) Mass surveillance. [Eg] - Pegasus snooping case.

Cybersecurity framework in India

- a) National cyber security policy, 2013 - aims for 5 lakh cyber security personnel.
- b) National Digital Communication Policy, 2019 - for data sovereignty.
- c) IT Act - mainly deals with e-commerce, blocking of content online.
- d) Centre - Cyber security agency.
- e) Cyber Swachhata Kendra - botnet clearing and malware analysis.
- f) Cyber Swachhata Bharat - for awareness generation.



Q.9)

Money laundering is the transformation of illegally gotten money into money earned from legal means. It is an organised crime.



Fig - money laundering process.

Money laundering is a global phenomena -

- i) Multiple jurisdictions involved.
[Eg] - Funding from one country, layering in other.
- ii) Safe haven countries: [Eg] - Cayman Islands are parking ground for illegat money on which taxes are not paid.
- iii) Financial secret countries: [Eg] - Switzerland provides financial

U.P.S.C.

severy to park money there.

iv) Round tripping and Base Erosion
and Profit Shifting - Companies

transfer profits to low tax jurisdictions.

v) Use of technology - [Eg] - crypto
currency, darknet etc for money
laundering.

Need for international collaboration

i) Only same heavens to unaccounted
black money. Build consensus.

ii) Investigation of cases. [Eg] - INTERPOL
can play huge role in assisting here.

iii) Extradition of accused. [Eg] -
Nirav Modi, Vijay Mallya not
yet extradited by UK.

iv) OECD treaty on BEPS must be
adhered to.

India can build consensus and
more treaties for coordinated
responses. Framework of Fugitive
Economic Offenders Act, PMLA can
be used.

U.P.S.C.

Q-10)

NISAR is NASA-ISRO Synthetic Aperture Radar. It is used for monitoring and observing on earth phenomena.

Role in managing climate change

↓
Monitor discharge of industrial effluents in water bodies.

observing deforestation
[Ex] - can provide images of areas where green cover is lost.

Reducing greenhouse gas emission. [Ex] - monitoring agri fields. Aid in precision farming

Role in managing natural hazards

↓
Improve capacity of first line responders with data.

→ Timely evacuation and relief can be provided.

→ Better prediction.
[Ex] - cloudbursts can be predicted.

U.P.S.C.

Radars are efficient tools in tackling climate change and natural hazards.

But their efficiency reduces with changing weather and climate patterns.

Hence they should be supplemented by other measures as well.

U.P.S.C.

Q.11)

Nuclear technology is associated with broadly two process of nuclear fusion and fission.

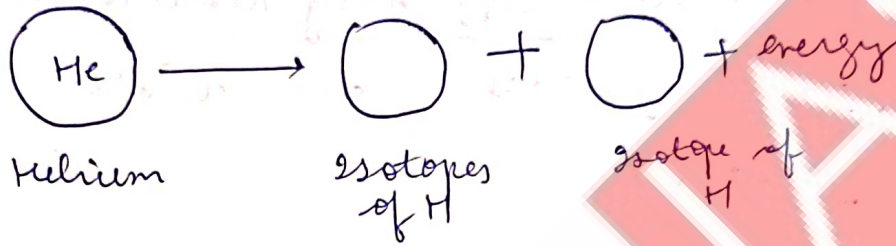


Fig - Fission



Fig - Fusion

Nuclear technology as panacea to dichotomy between development and ecology -

a) Ecological benefits -

- No Green House Gas Emission
- Resource efficient. (Eg) - fusion produces 4 million times fuel than oil.
- Rising importance due to climate change.

b) Development benefits

- Reduce India's import dependence on fossil fuels.
- Can power rising energy needs.

(eg) NITI report said by 2050, India will need 4 times more electricity.

- Energy security - SDG
- Electricity a major ingredient for development.

India's 3 stage nuclear program

1st stage - Pressurised Heavy water Reactor
(uses imported Uranium)

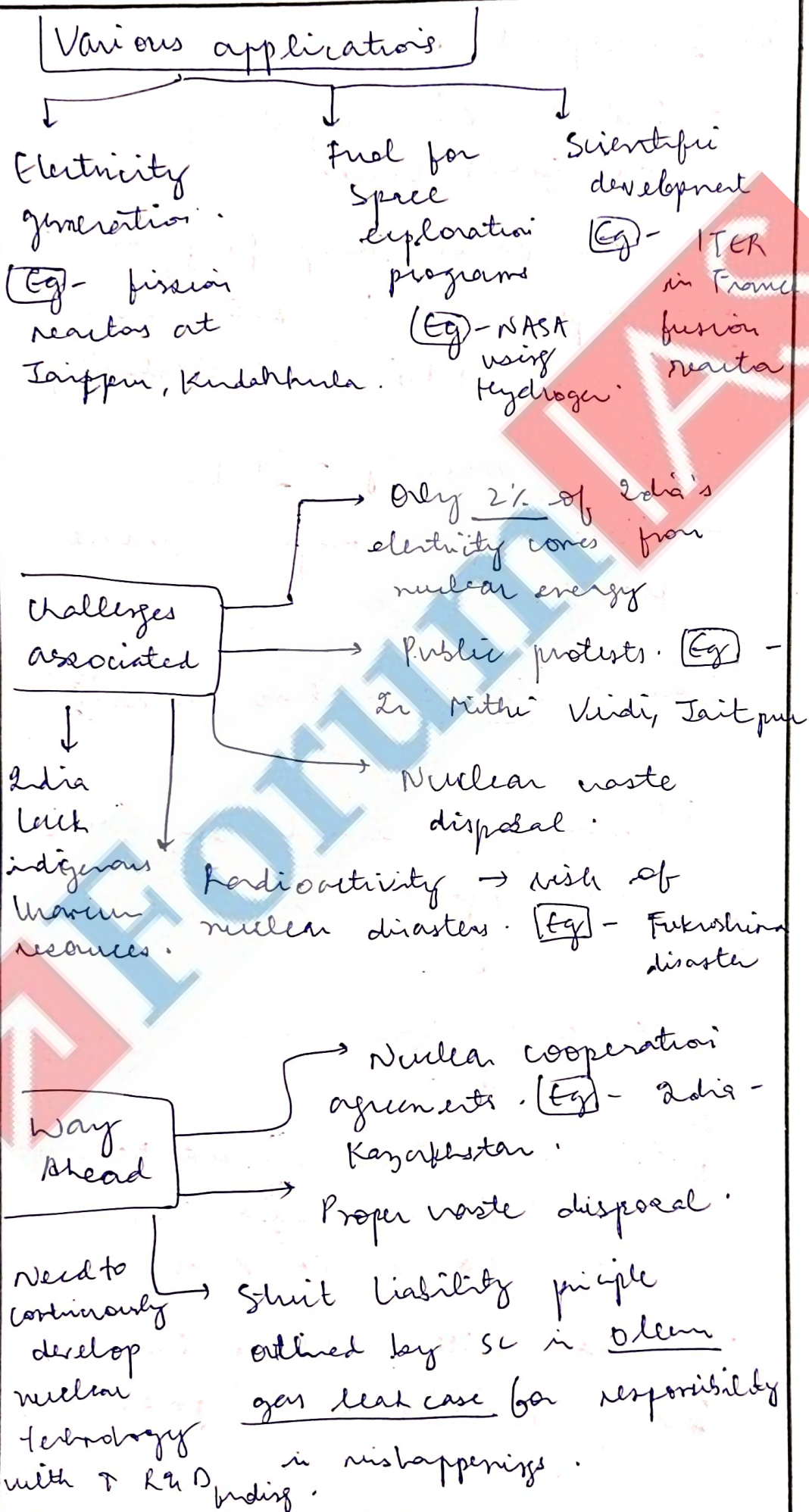
↓

2nd stage - Light water Reactor

↓

3rd stage - Thorium based Reactor
(indigenous thorium reserves in Andhra, Kerala etc)

The plan will lead to India becoming a major nuclear power.



U.P.S.C.

(Q.12)

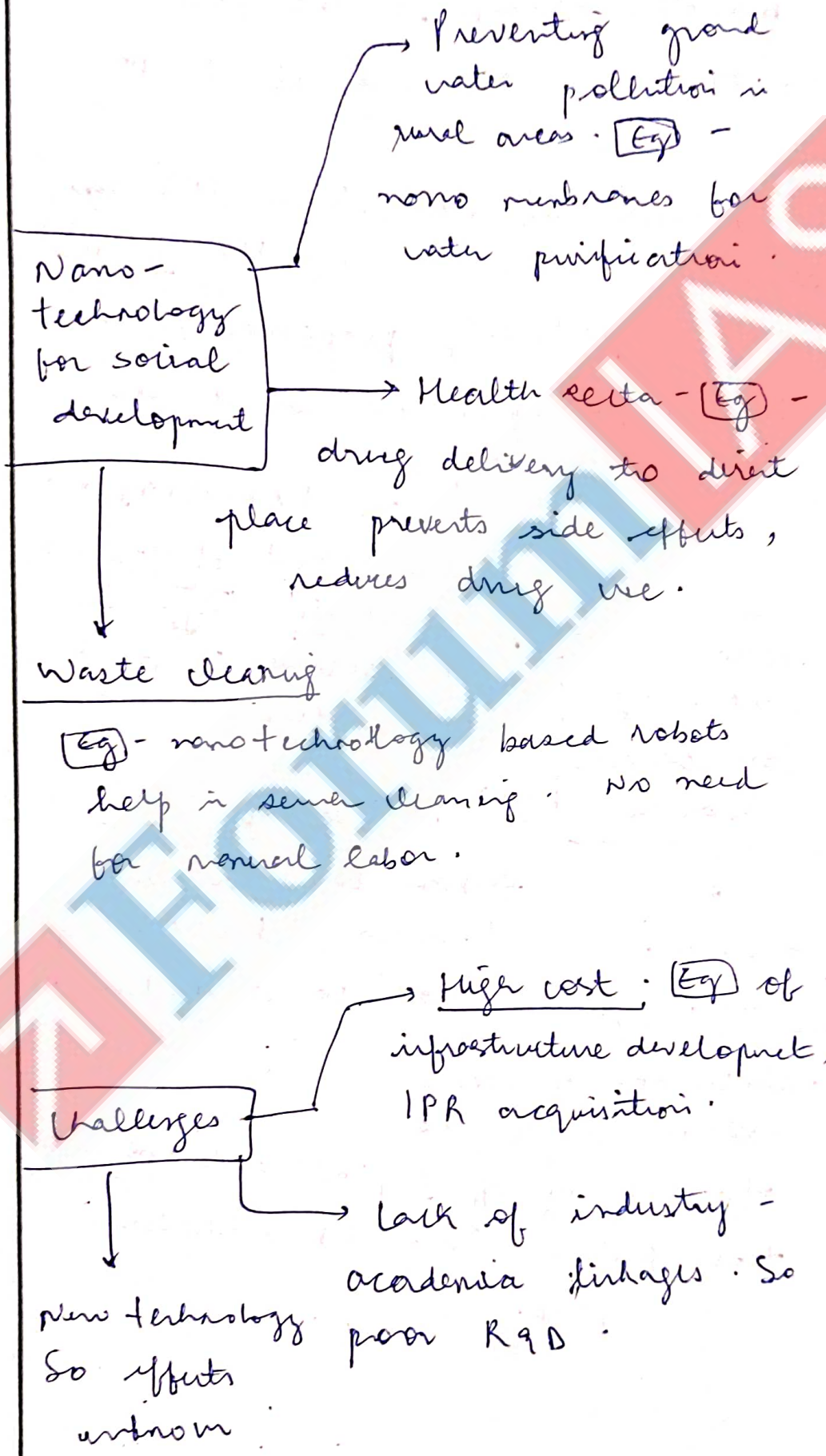
Nanotechnology is associated with materials in the size of 1-100 nano metres.

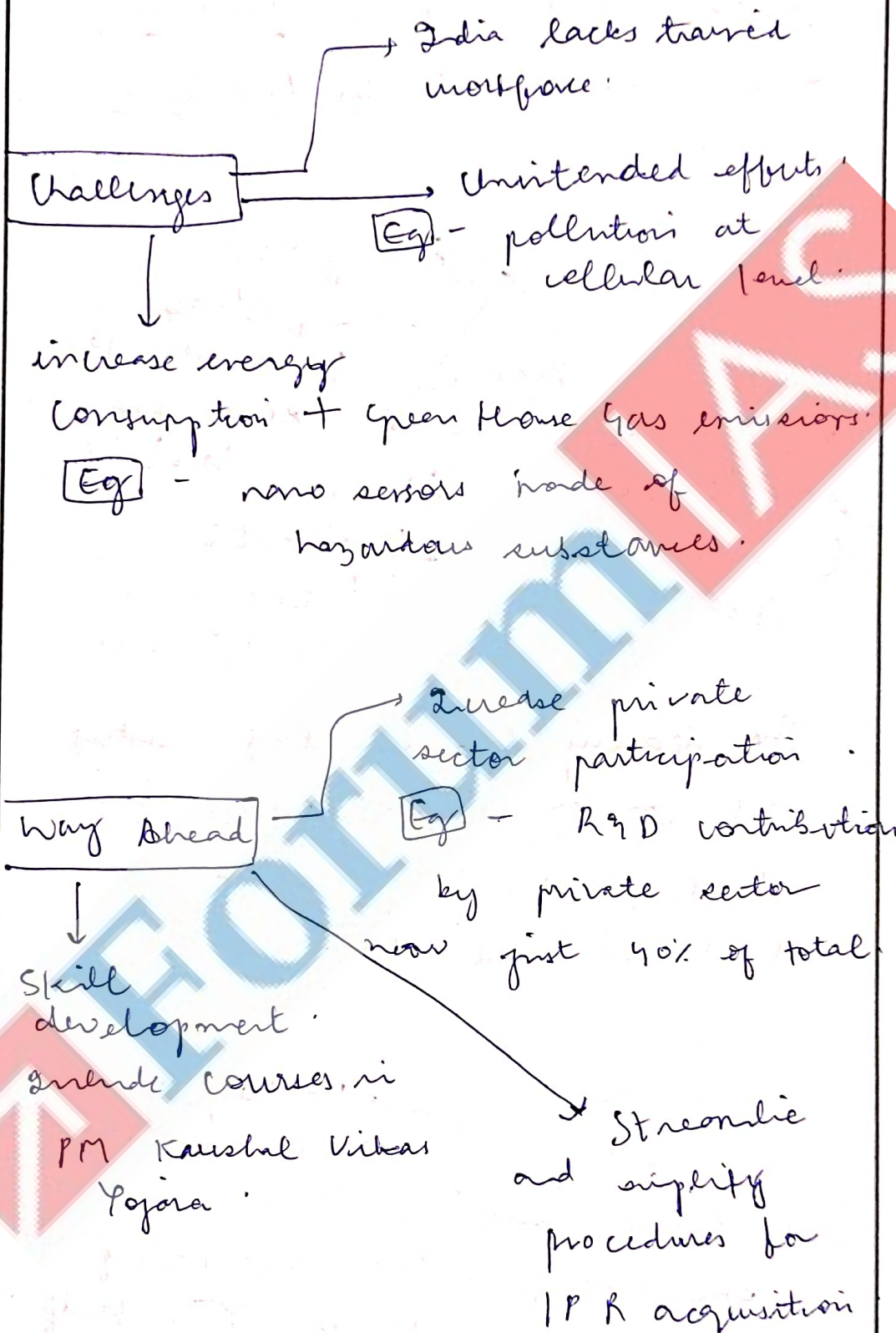
Conversion of materials at this size results in alteration of their physical, chemical, electrical properties etc.

Therefore it opens new avenues for Research & Development.



U.P.S.C.



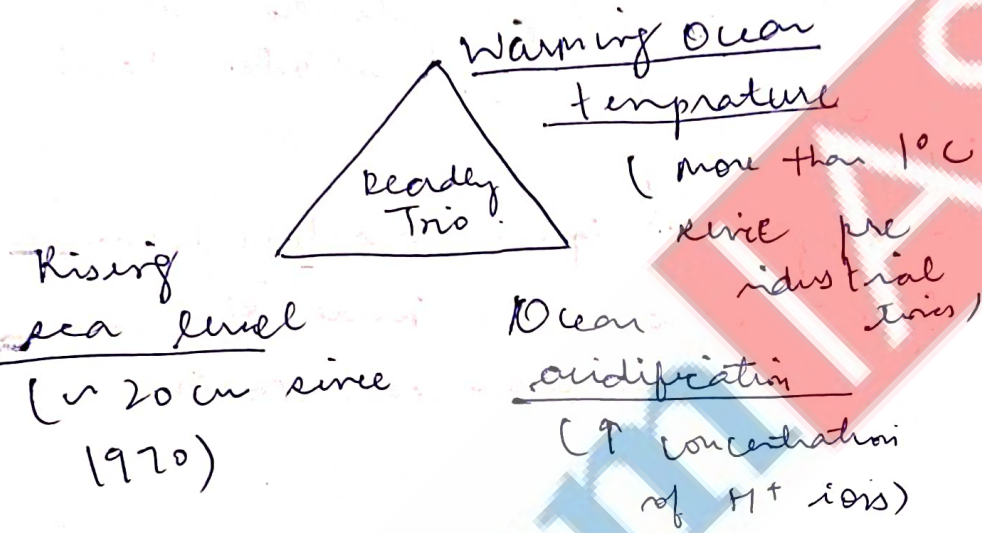


National Mission on Nano-Technology

by Department of Science is the step in right direction to nurture nano-tech framework in country.

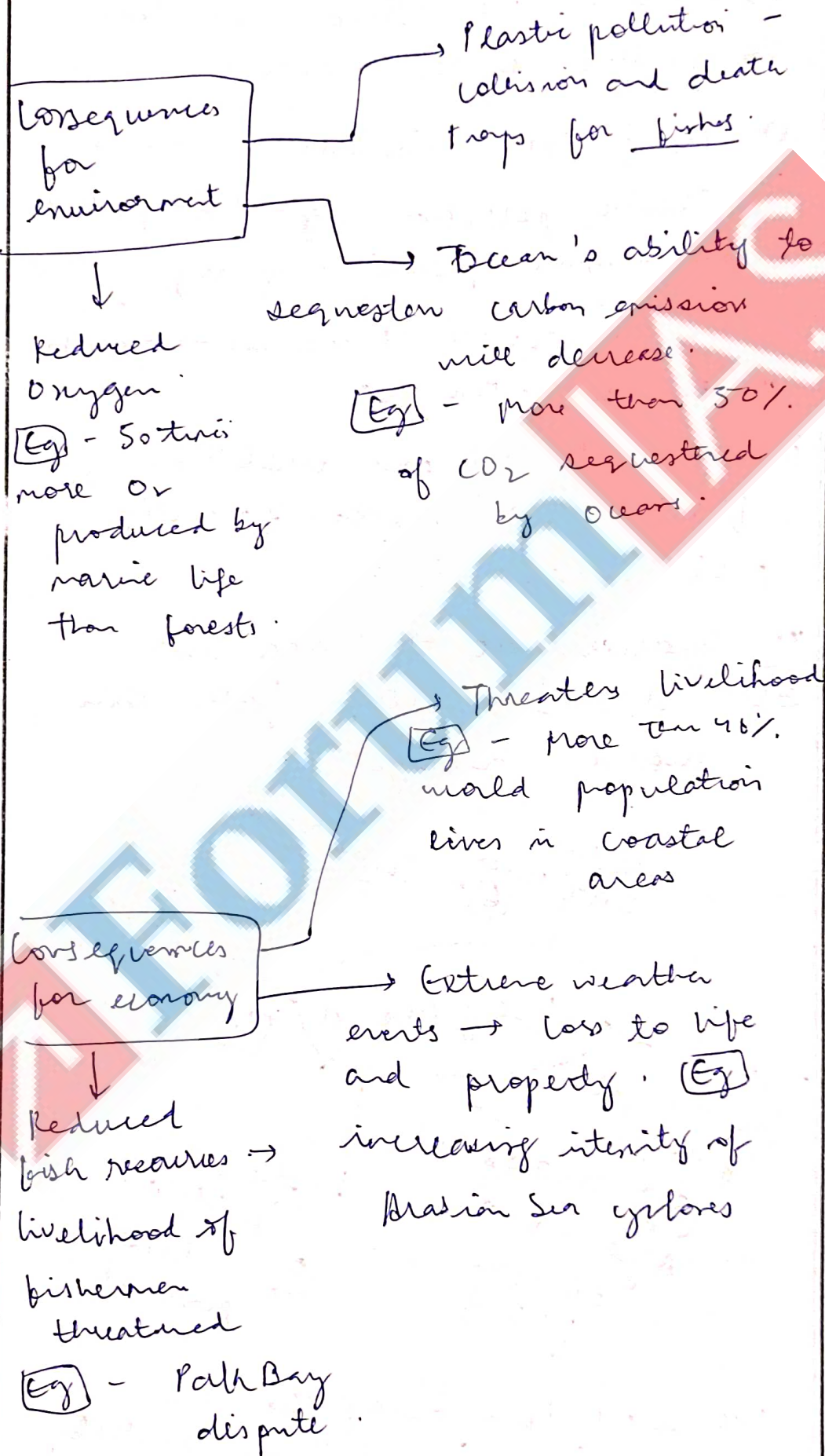
Q. 13)

Sustainable Development Goal 13
outlines commitment for life below
water:



The deadly trio has long lasting and irreversible consequences for whole planet in general and oceans in particular:

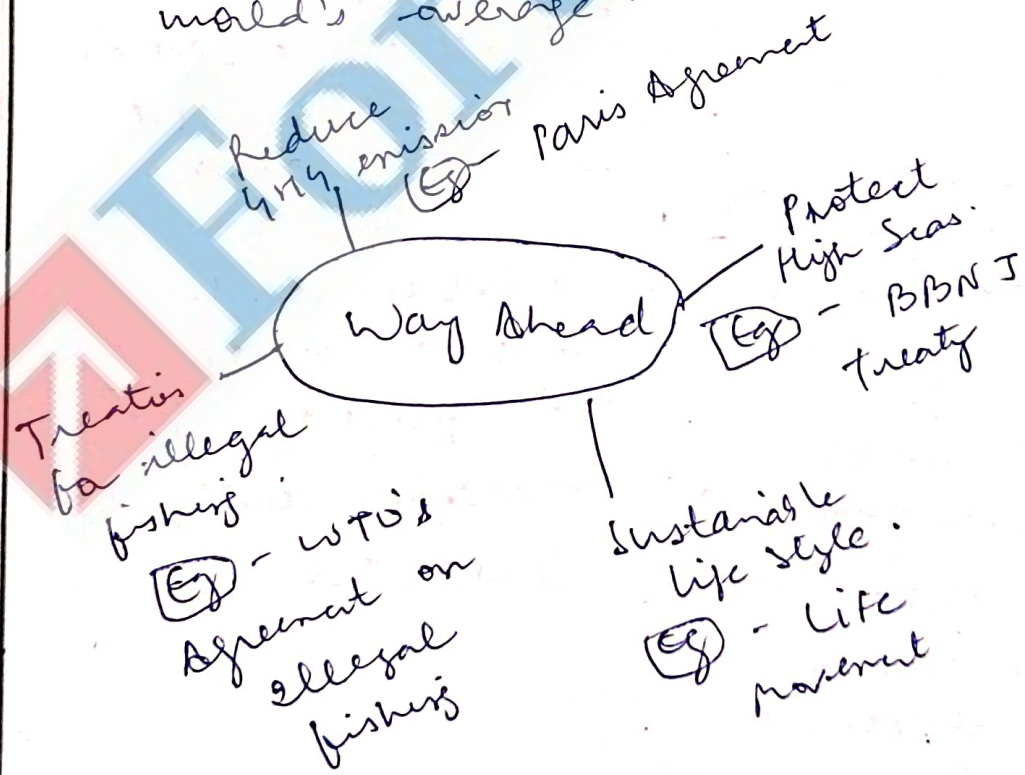
- Consequences for environment
- 1 - Wiping out marine diversity
 - 2 - Threatening corals. [Eg] - Half of corals at Great Barrier Reef died.
 - 3 - leads to extreme events like cyclones.



U.P.S.C.

For tackling this thro. we need to understand the causes -

- i) Rising GHG emissions.
- ii) Plastic pollution. (Eg) - India produces 25,000 tonnes plastic every day.
- iii) No wastewater treatment → goes to oceans untreated.
- iv) Unsustainable and unscientific fishing. (Eg) - bottom trawling in Indian Ocean.
- v) Glaciers melt → ↑ sea level.
(Eg) - Arctic melting faster than world's average.



We need both adaptation and mitigation measures for protecting oceans.

U.P.S.C.

Q-14)

Recently India saw many urban floods instances. [Eg] - Hyderabad, Chennai, Mumbai, Surat etc.

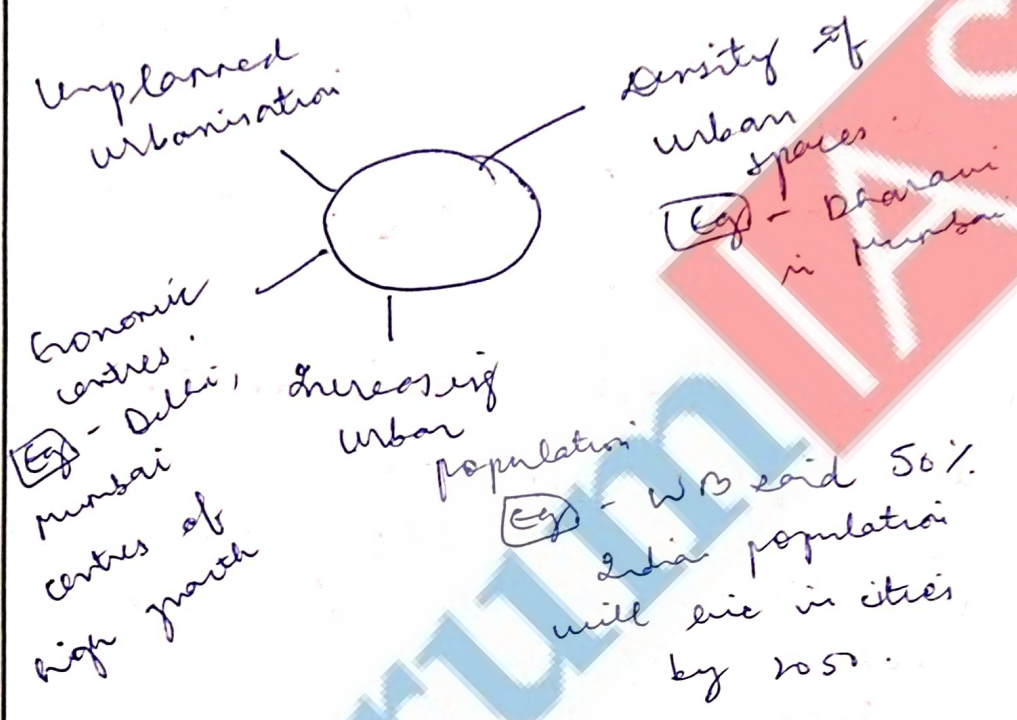
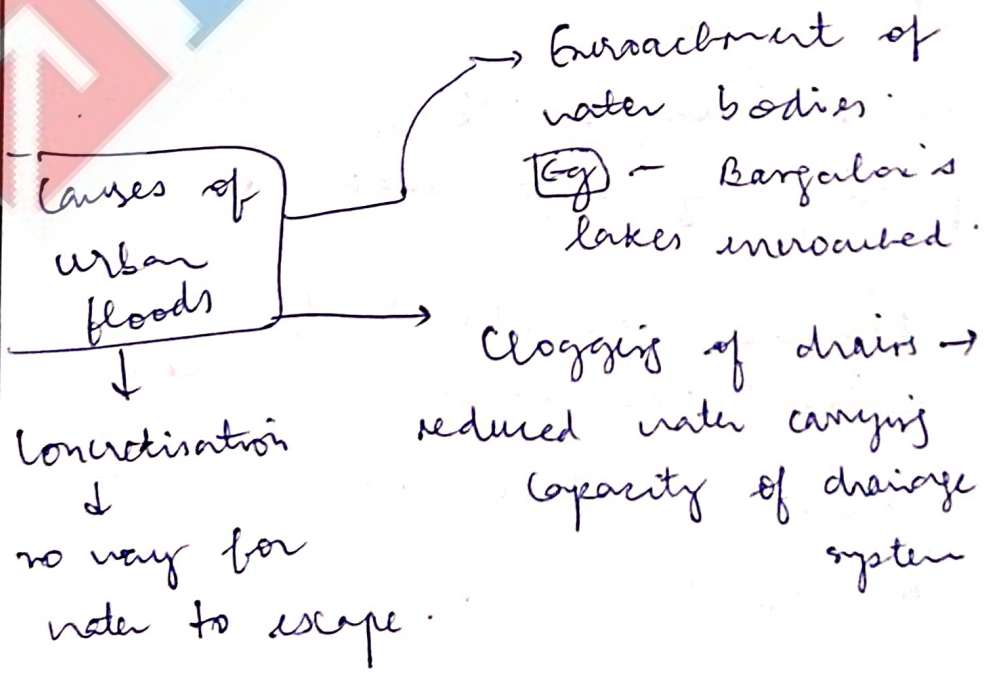


Fig - Factors that increase vulnerability of cities to urban floods



Causes → Old and cramped drainage system. (Eg) - Mumbai city floods after little rain

Geographical reasons

- (i) More than 80% rain in 4 months of July - September.
- (ii) Spatial and temporal variation in rainfall. (Eg) - Thar and Chhota Nagpur in Meghalaya.
↓
It increases vulnerability of some areas.

NDMA Guidelines on urban floods

a) Mitigation

- i) Periodic de-clogging of drains, particularly before monsoon.
- ii) Remove encroachments from natural water bodies like lakes.
- iii) Follow Coastal Zone Regulation (CRZ) guidelines.

- iv) NO encroachment and illegal sand mining on river beds. (Eg) - Yamuna riverbed encroached.
- v) sponge cities, Bioswales in New York.
- ~~Strategy~~ b) management strategy

(i) Timely evacuation of people. (Eg) - Koveni recently Gujarat floods after cyclone.

ii) Adequate medical aid and shelter → immediate relief.

iii) Check for diseases like cholera, dengue, malaria.

iv) Cattle mounds, escape structures for people. (Eg) - for Rhinos in Assam.

v) Warning by IMD should be timely.

Focus on both mitigation and management will lead to timely relief.

Urbanisation that is in harmony with nature will lead to less of urban floods. (Eg) - Dutch 'government's new mantra - live with water, build with water.

Q.15)

Naxalism is the political ideology based on ideas of Mao of China. It believes in violent overthrow of state to usher in socio-economic change.



Fig - Influence of Naxalism

Downward trend in Naxalism

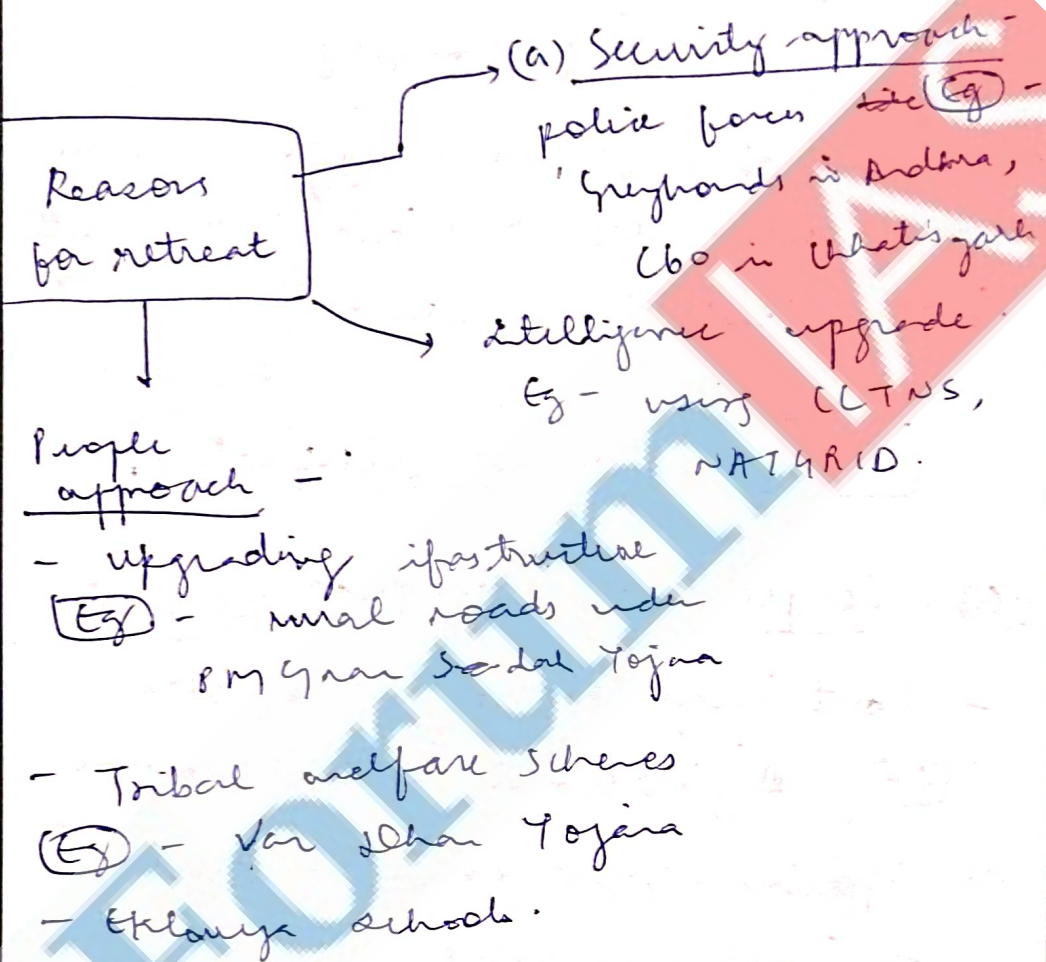
(a) Incidents of violence brought down by 70% from 2012.

(b) Affected districts reduced from 200 to 60 (MHA).

But thriving in core areas - still active in Chhattisgarh, Odisha etc.

U.P.S.C.

Districts like Dantewada, Subra, Datsar
are severely affected.



Reasons for continuance

- Ability to change strategy quickly
- using tribal people for short term tactical purposes as local militia
- continuous supply of funding (Eg) - monopoly of forest resources and government contracts in areas

प्रश्न संख्या
(Question No.)

U.P.S.C.

of dominance.

- 1) Supply of recruits - (Eg) - youth unemployment and violence compels to join militias for safety.
- 2) Lack of governance. (Eg) - Subarna and Bastar are 2nd and 3rd most bottom districts in literacy.

Measures towards eliminating

(a) People centric approach

- Continuous development of area.
- (Eg) Aspirational District Program.
- Effective governance → trust building in people.
- Upgrade infrastructure. (Eg) - roads, PHCs, schools.

(b) Security centric approach

- upgrading police forces of states.
- (Eg) - security related expenditure share.
- Deployment of forces like CRIF.
- upgrading intel. (Eg) - develop local intel networks.

need mixture of both approaches.

U.P.S.C.

Q. (b)

Group of LDCs, Alliance of Small Islands States (AOSIS) are continuously demanding climate justice.

Recent talks at LOP 27 of UNFCCC at Shan-al-Sheikh about loss and damage highlight the predicament of most vulnerable groups.

Most marginalised, most affected

(a) People of AOSIS - due to sea level rise (up to 1m since 1970s).

(Ex) - many countries like Vanuatu face threat of submergence.

(b) low income groups. (Ex) - farmers and workers in construction sector are most affected due to heat waves.

(c) Coastal population - due to extreme weather events like cyclones, storm surges and loss.

of livelihood. (Eg) - more than half marine species will be extinct by end of century (UNESCO).

iv) Huge disparity in emission. (Eg) - More than 50% emissions come from USA and EU. But countries like Africa are threatened.

v) Developing countries like India. (Eg) Avg per capita emission of India - 1.4 tonnes/year. World average - 4 tonnes/year. But forced to reduce climate emissions.

vi) Some rich countries like Canada will benefit due to increasing agricultural productivity (because temperature increase). While in Nigeria, Kenya, agriculture productivity reducing due to heat stress.

(Climate Resilient Model)

(a) Mitigation - means removing or reducing greenhouse gas

emissions to reduce impacts of climate change.

- Use of Renewable energy sources.
(Ex) India's committed for 50% energy needs by REN by 2050.
- Sustainable life style. (Ex) Life movement
- Agriculture - climate smart. (Ex) growing millets, pulses.
- Energy efficient buildings. (Ex) - Energy Conservation Building Code.

(b) Adaptation - means adjustment with the effects of climate change.

- Heat Action Plan - to deal with heat waves.
- Agriculture - Paromparegat Krishi Vikas Yojana, Organic farming
- Zone wise warning systems for cyclones.
(Ex) - IMD warning for coastal areas.

We need both adaptation and mitigation measures to deal with effects of climate change. Technology transfer + financing by developed world is urgently needed.

Q. 17)

Disaster Risk Reduction (DRR) is a process of reducing vulnerability associated with disasters.

$$\text{Hazard} + \text{Vulnerability} = \text{Risk}$$

↓

DRR Measures

↓

Risk Reduction

DRR increases preparedness to manage disasters.

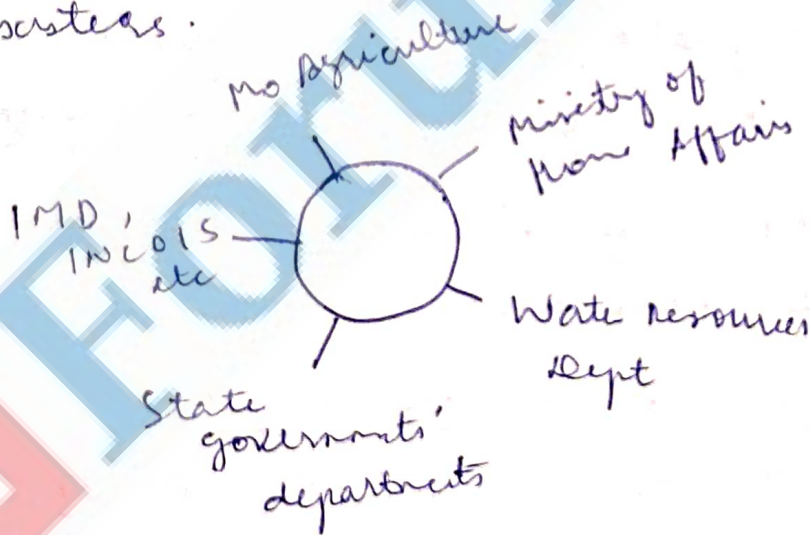


Fig - Multi sectoral process

Central government → State government →
Local bodies + NGOs + Civil
Society + People

Fig - Multi layered process

Constraints in DRK

- (a) Inadequate planning. (Eg) - No planning framework for urban floods.
- (b) Lack of infrastructure. (Eg) - No earthquake and flood resistant measures taken in Himachal Pradesh's ~~some~~ Solan Valley.
- (c) No involvement of local bodies. (Eg) Role of gram Sabha, ULBs still not clear.
- (d) Non-inclusion of some disasters. (Eg) - Heatwaves not notified disaster yet.
- (e) Climate proofing. (Eg) - Uttarakhand's cloudbursts caused due to climate change but this is not taken into account.
- (f) Indigenous knowledge documentation is not done. (Eg) - local drought resistant crops.
- (g) Lack of community participation. (Eg) - 1st line of responders. But forest department not train them.

in forest fire prevention

Measures for building disaster resilient strategies

- Involvement of all stakeholders -
Experts + Community + NGOs + Local bodies
- Bottom up approach
- Allocating funding - (Eg) Can use
MPLAD funds
- Developing local knowledge centres
(Eg) Sumanthar Centre in Pudukkottai
documents knowledge about Tsunami
- Training in response to local
officials, police, people
- Climate proofing - Taking into
account local climate studies
(Eg) Ravi Chopra Committee for
cloudbursts and floods in Uttarakhand

For effective DRK, we need
whole of society approach.

Q. (100)

Recent ethnic conflict and resultant violence in Manipur has threatened to disrupt peace and development in North-East.

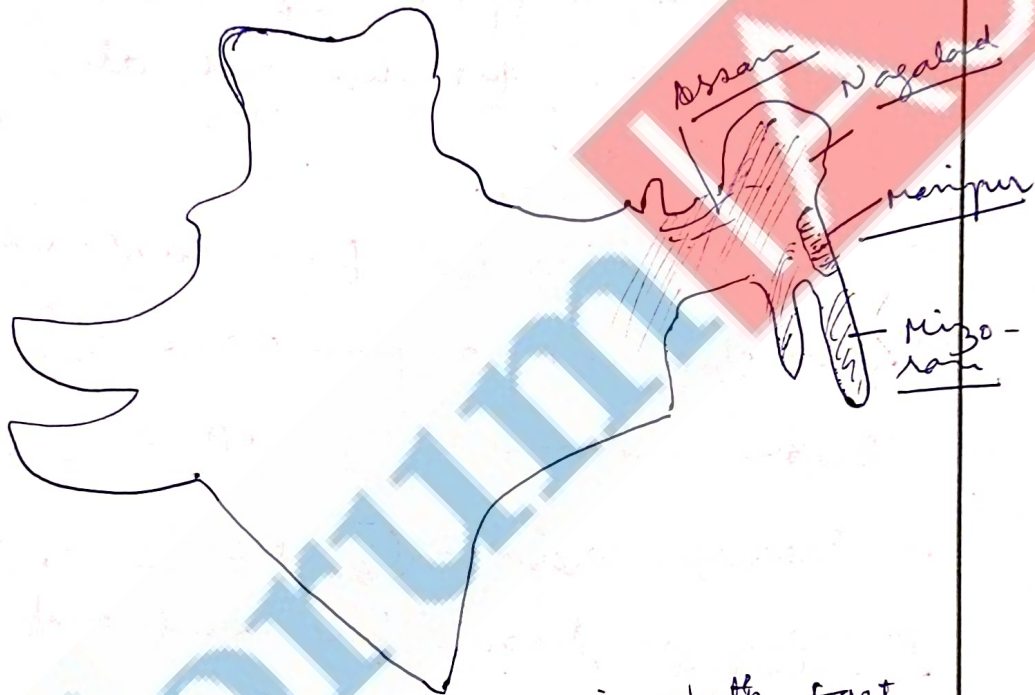


Fig - Map showing North East conflict areas

Causes of conflict

(a) Ethnic issues

- North East is home to many tribes. (Ex) - Nagas, Kuki, Chin etc
- Recent Manipur conflict with Meitias and Kukis - Zomi due to ST status to Meitias.
- Tribal loyalties to tribes lead

U.P.S.C.

to frequent conflict with other tribal groups. (Ex) - Naga insurgency for greater Nagalim.

(b) More than ethnic conflict

- External support. (Ex) - training in Myanmar, funding and arms from China.
- Illegal migration from Bangladesh → fears of demographic change. (Ex) - Assam movement by AASU.
- Fragile location. (Ex) more in Manipur is known for drug and human trafficking.
- Lack of connectivity with mainland → lack of development.
- AFSPA and human right violations by security forces → alienation in people. (Ex) - SC judgment is extrajudicial killings in Manipur.

U.P.S.C.

(Measures to tackle the conflict)

(a) Security approach

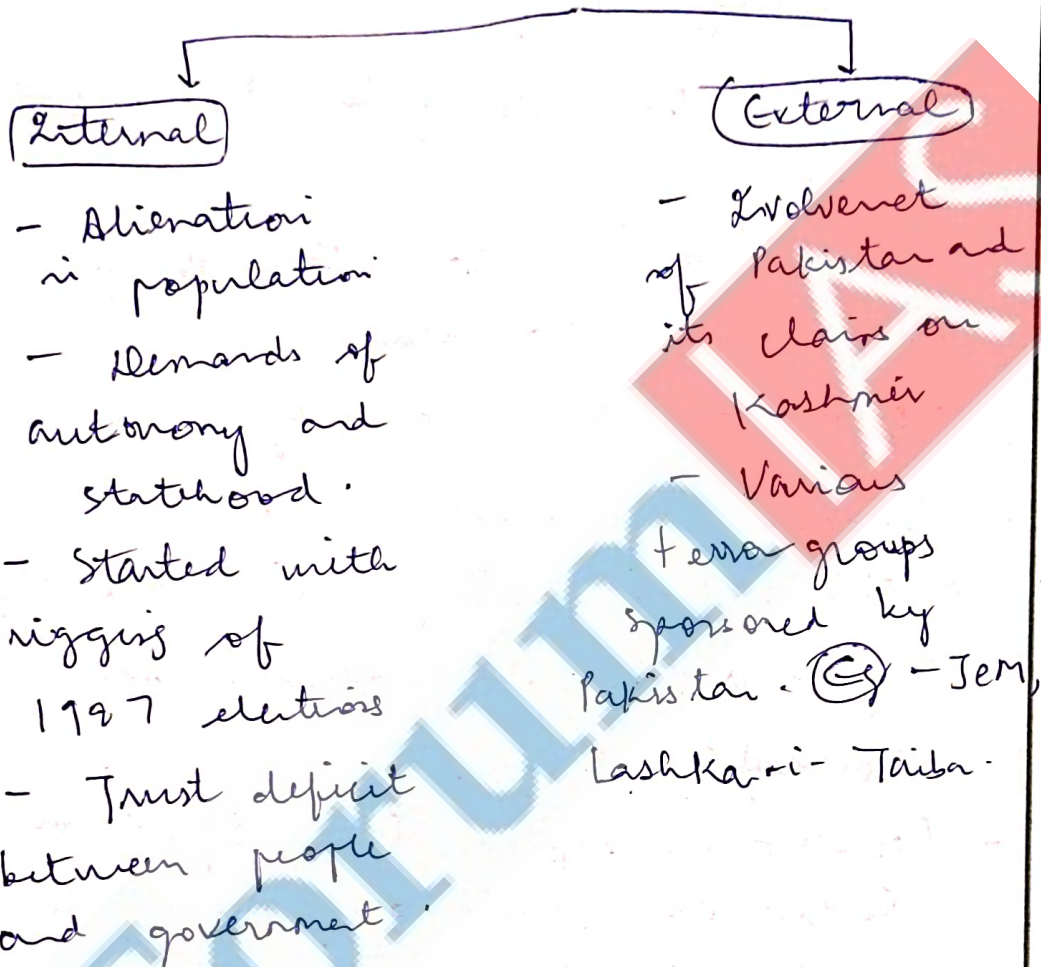
- Training to local police + deployment of Army.
- Single mandate to either Army or Assam Rifles to deal with conflict → Accountability.
- Comprehensive surrender cum rehabilitation policy. (Eg) - Recently many insurgents surrendered in Assam, Nagaland.
- Coordinated efforts. (Eg) - Operation Sunrise to flush out insurgents with Myanmar.

(b) People centric approach

- Development of region. (Eg) - IM DeVINE Scheme for both social and infrastructure development.
 - Autonomy - 6th schedule.
 - Improve employment situation → prevent youth alienation.
 - Improve connectivity with railroads. (Eg) - Bridges, roads.
- Need comprehensive approach.

Q. 19)

Military and terrorism in Jammu and Kashmir has two aspects.



Role of development initiatives

- (a) Reduces trust deficit → prevents alienation.
- (b) Improve economic situation → less motivation and need to join militancy.
- (c) Improve investment climate in the region → increases job prospects.

U.P.S.C.

(d) Social development initiatives like for Health, Education leads to poverty reduction → more prosperity → focus on work rather than militancy.

(e) Efficient governance leads to sense of belongingness in people towards state.

Inadequacy of development initiatives

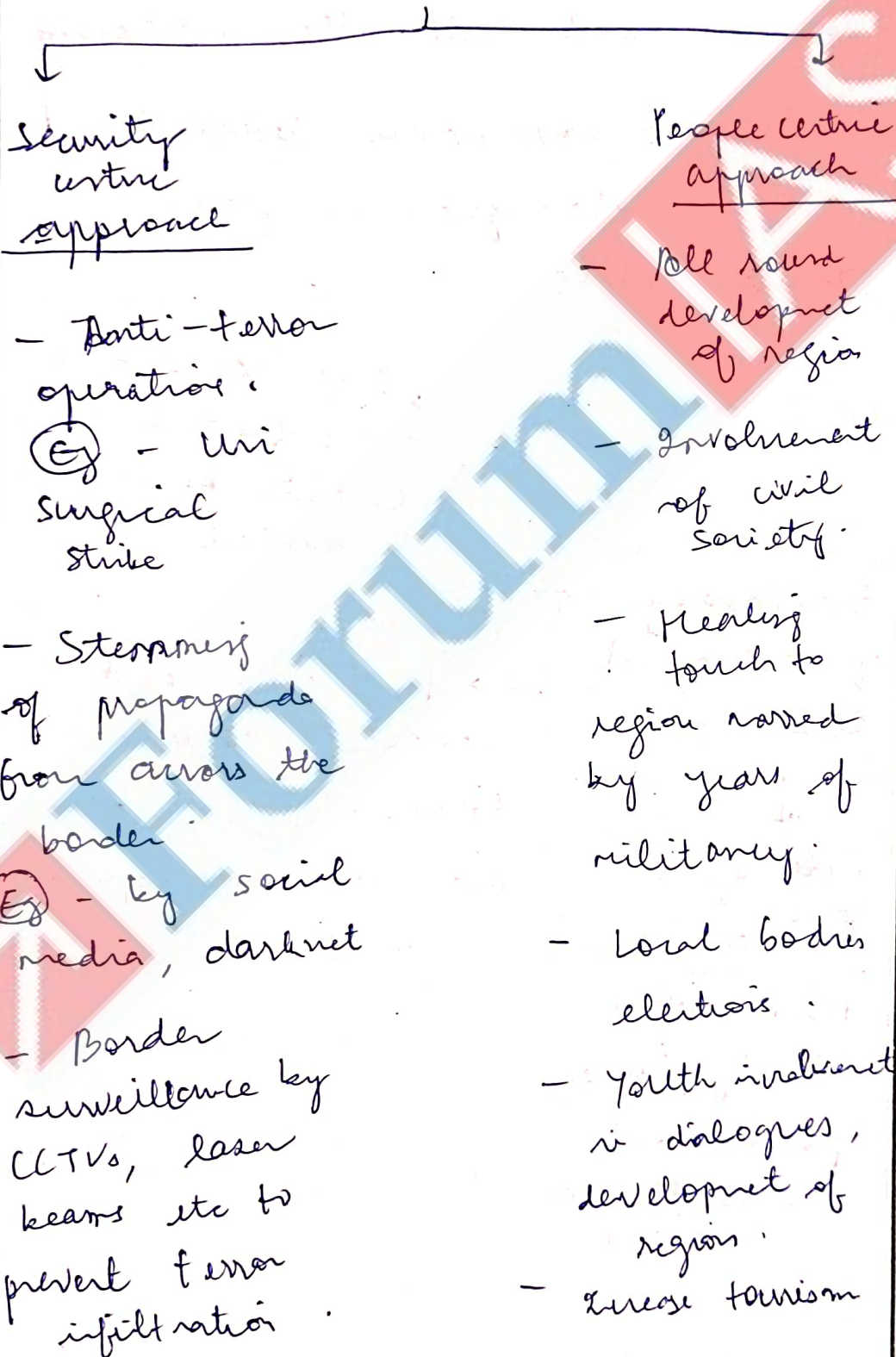
Role of Pakistan →

Need constant security forces presence and surveillance measures

Root cause - i.e. radicalisation cannot be tackled

→ Propaganda and terror ideology by terror groups need more than development efforts.

Therefore a mix of both people centric and security centric approach is needed.



Government's recent efforts in both direction will lead to long lasting peace.

Q.20)

Generative AI is the ability of computer (-algorithms) to generate new content from existing content like videos, images, audio etc.

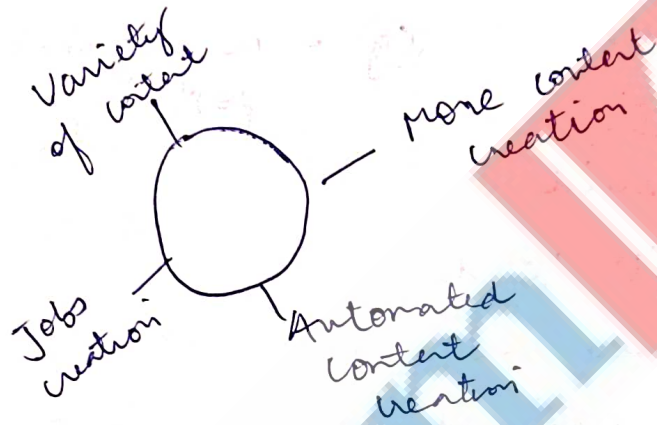
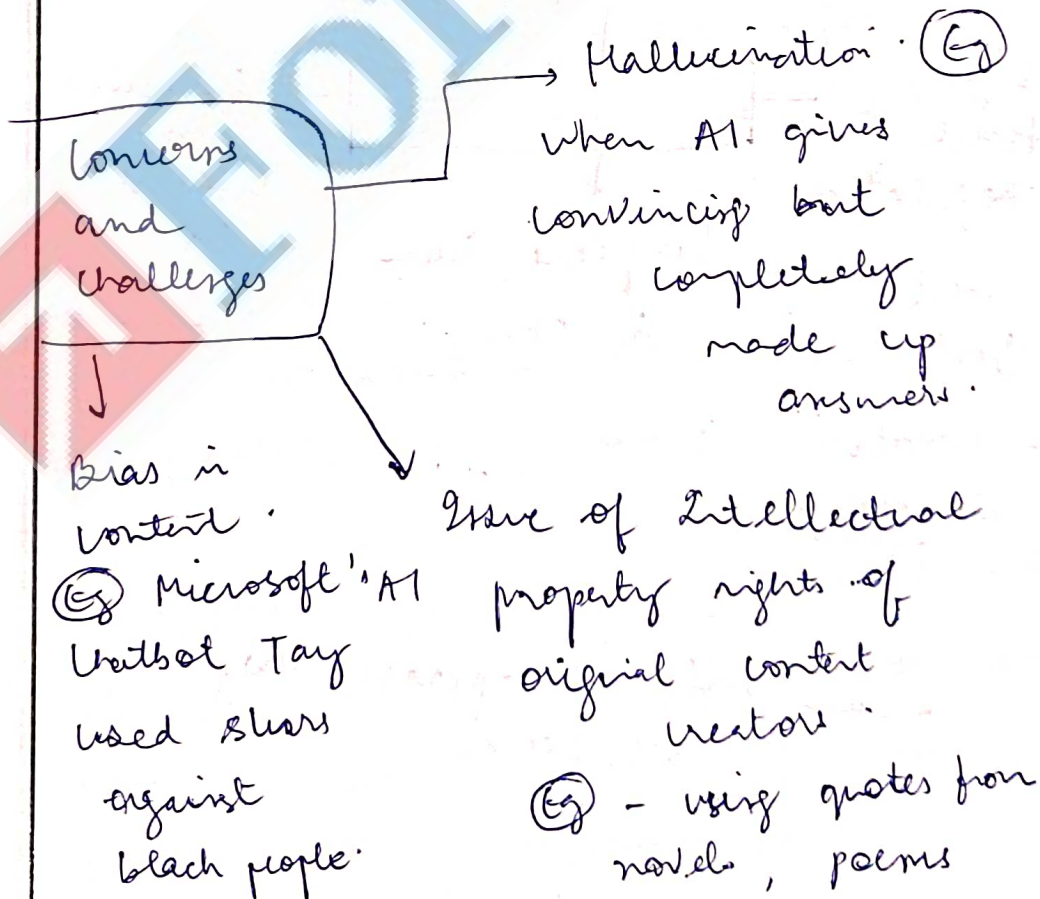


Fig - Benefits of Generative AI



U.P.S.C.

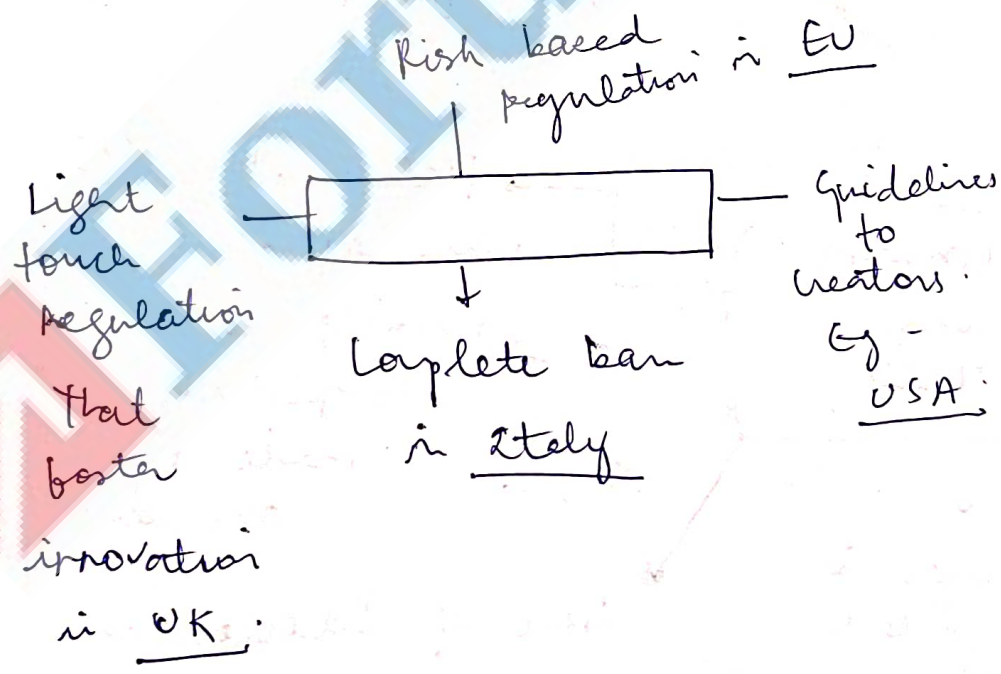
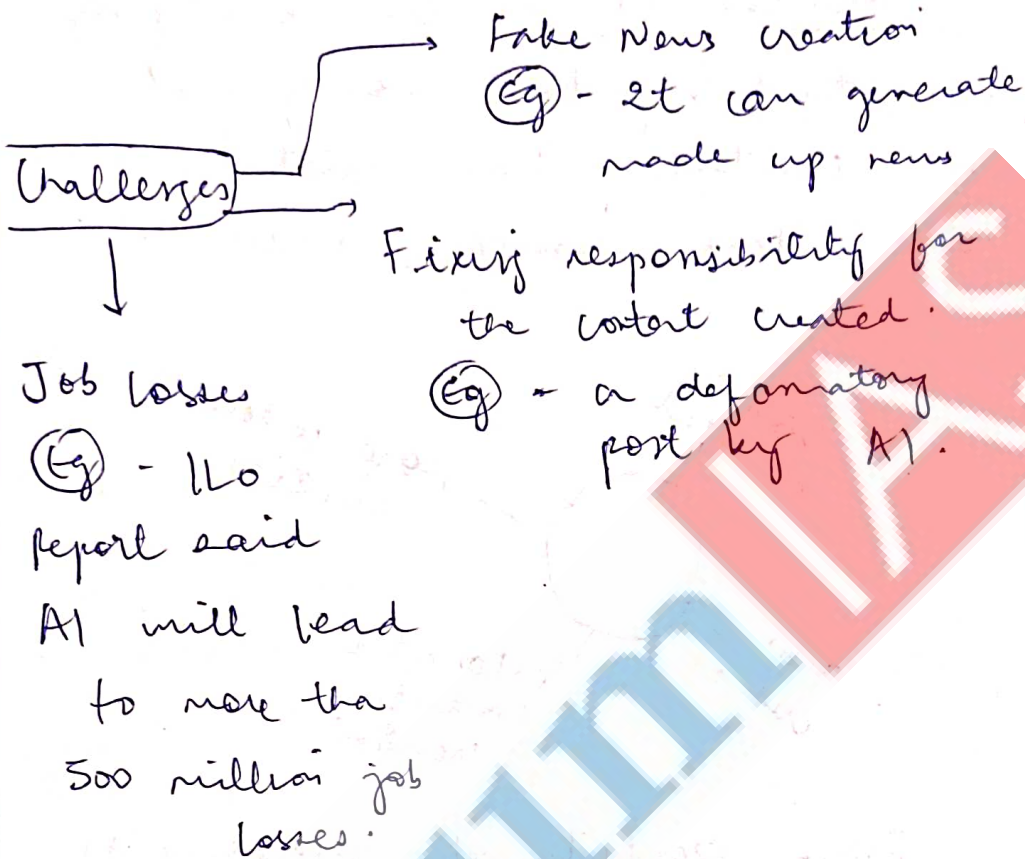


Fig - Different approach to regulation

(Regulations' model)

- (a) Based on ethics, respect for human dignity. (Eg) - deep nudes can be generated by AI. So need to stop that.
- (b) Guidelines by ICMR for AI in healthcare.
- (c) NITI's strategy of Responsible AI for all.
- (d) As founding member of Global Partnership for AI (GPAI), India can play a leading role in formulating regulation framework with other countries.
- (e) AI is an evolving technology, so regulations too will need to be updated continuously.

Elon Musk, Steve Wozniak have called for 6 month pause on AI development and building regulation for use by experts, labs, creators etc.