



GENERAL STUDIES

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| Name Of Candidate | SAMIKSHA SARWARI | | |
| Roll No. | 1910084590 | Date: | 14/08/2022 |

Time Allowed: Three Hours

Maximum Marks: 250

| INDEX TABLE | | | INSTRUCTION |
|--|------------|----------------|--|
| Q. No. | Max. Marks | Marks Obtained | <p>1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet.</p> <p>2. There are TWENTY questions printed in ENGLISH & HINDI, all questions are compulsory.</p> <p>3. The number of marks carried by a question/part is indicated against it.</p> <p>4. Answers must be written in the medium authorized in the admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided.</p> <p>5. Word limit in questions, if specified, should be adhered to. Any page or portion of the page left blank in the Question-Cum Answer Booklet must be clearly Struck off.</p> <p><i>Any specific messages for ForumIAS Mentors/Evaluators with respect to your copy? Write it here.</i></p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> |
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| Total: | 250 | | |
| Evaluator's Discretion: | | | For Student Only |
| | | | Start Time 8:30 pm |
| Total Marks: | | | Mode Of Examination: Online <input checked="" type="checkbox"/> Offline <input type="checkbox"/> |
| Evaluator's Discretion: This is the marks awarded at the discretion of the evaluator based on your overall impression, on the basis of (but not limited to) your handwriting, presentation, use of diagrams, flowcharts, facts and figures or absolutely anything that he/she liked in your copy. | | | For Office Use Only |
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Note: You can discuss your evaluated copy with the Mentor. Raise a ticket from your portal to schedule a mentor call or visit the offline centre to meet mentor (all 7 days, Timings - 11 AM to 6 PM). Further if you are unsatisfied with the evaluation, you can seek re-evaluation of the copy.

| Parameters | Excellent | Very Good | Good | Average | Poor | Very Poor |
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ADDITIONAL REMARKS

ForumIAS



Q.1) The consequences flowing from genetically modified organisms are debatable, but the advantages justify the risk. Do you agree? Discuss. (10 marks, 150 words)

आनुवांशिक रूप से संशोधित जीवों (GMO) से निकलने वाले परिणाम बहस योग्य हैं, लेकिन इसके फायदे जोखिमों का औचित्य सिद्ध करते हैं। क्या आप सहमत हैं? चर्चा कीजिए। (10 अंक, 150 शब्द)

Genetically modified organisms (GMO) are the organisms whose genetic make-up has been altered artificially.

[ex] GMO Bt-Cotton — Cotton genes modified using soil bacterium's (BT) genes.

[GMO Advantages]

① Resilient crops → food security

- pest resistant [ex] Bt Brinjal
- drought resistant
- high yield varieties

② Health applications

↳ pharmaceutical research on GMO like GM-rats.

↳ "vaccines through food"

[ex] UK's trial of measles vaccine through tomato.

- ② ↳ Malaria eradication - "Gene drive" research by Oxford to skew offspring sex ratio through GM to eradicate mosquitoes.
- ↳ medicines [ex] human insulin production.

③ Environmental

- ↳ biodiversity conservation
- [ex] Woolly Mammoth project
- ↳ phytoremediation organisms can be created.

However, there are apprehensions

- ① Lack of adequate research on long term effects.
- ② Potential abuse of technology
- [ex] Designer babies.
- ③ Impact on ecosystem needs research
- [ex] introduction of modified species like woolly mammoths in future.

Given the legitimate risks, but the necessity of the technology in varied fields, a cautious approach backed by scientifically rigorous research would be a good way forward.

Feedback

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Q.2) How are fuel cell electric vehicle (FCEV) different from battery electric vehicle (BEV)? Highlighting advantages of electric vehicles, suggest measures for accelerating e-mobility adoption in the country. (10 marks, 150 words)

ईंधन सेल इलेक्ट्रिक वाहन (FCEV) बैटरी इलेक्ट्रिक वाहन (BEV) से कैसे भिन्न हैं? इलेक्ट्रिक वाहनों के लाभों पर प्रकाश डालते हुए, देश में ई-मोबिलिटी अपनाने में तेजी लाने के उपाय सुझाएं। (10 अंक, 150 शब्द)

Electric vehicles (EVA) are powered through electricity instead of conventional fossil fuels like petrol/diesel/natural gas.

| Fuel cell EV | Battery EV |
|--|--|
| ① powered by <u>Hydrogen fuel cell</u> . | ① powered by <u>Lithium-ion battery</u> . |
| ② <u>High efficiency, range</u> . | ② Good efficiency (less than FCEV), <u>range- anxiety concerns</u> . |
| ③ by product — H_2O . | ③ No waste by-product. |

Advantages of Electric vehicles

- "clean" mobility
 - ↳ no pollutants discharge like SO_x , NO_x , etc.
- "Green" mobility
 - ↳ reduced carbon emissions (if green hydrogen and green electricity used)

↳ reduce import dependence (India imports 85% of its fossil fuel requirements)
 ↓
Energy security
 + saves forex

↳ reduced noise pollution

Measures to aid adoption

① Supply support measures
 ex) Govt's PLI Scheme.

② Demand Impetus — subsidies
 — awareness
 — supporting infrastructure
 ex) FAME scheme.

③ Research & Development
 ↳ "Green Hydrogen" (currently only 1% of hydrogen is Green)
 ↳ battery research — ~~for~~ for self-reliance

Faster e-mobility adoption will aid in SDG 11 (sustainable cities), SDG 7 (clean energy) and SDG 13 (climate Action).

Feedback

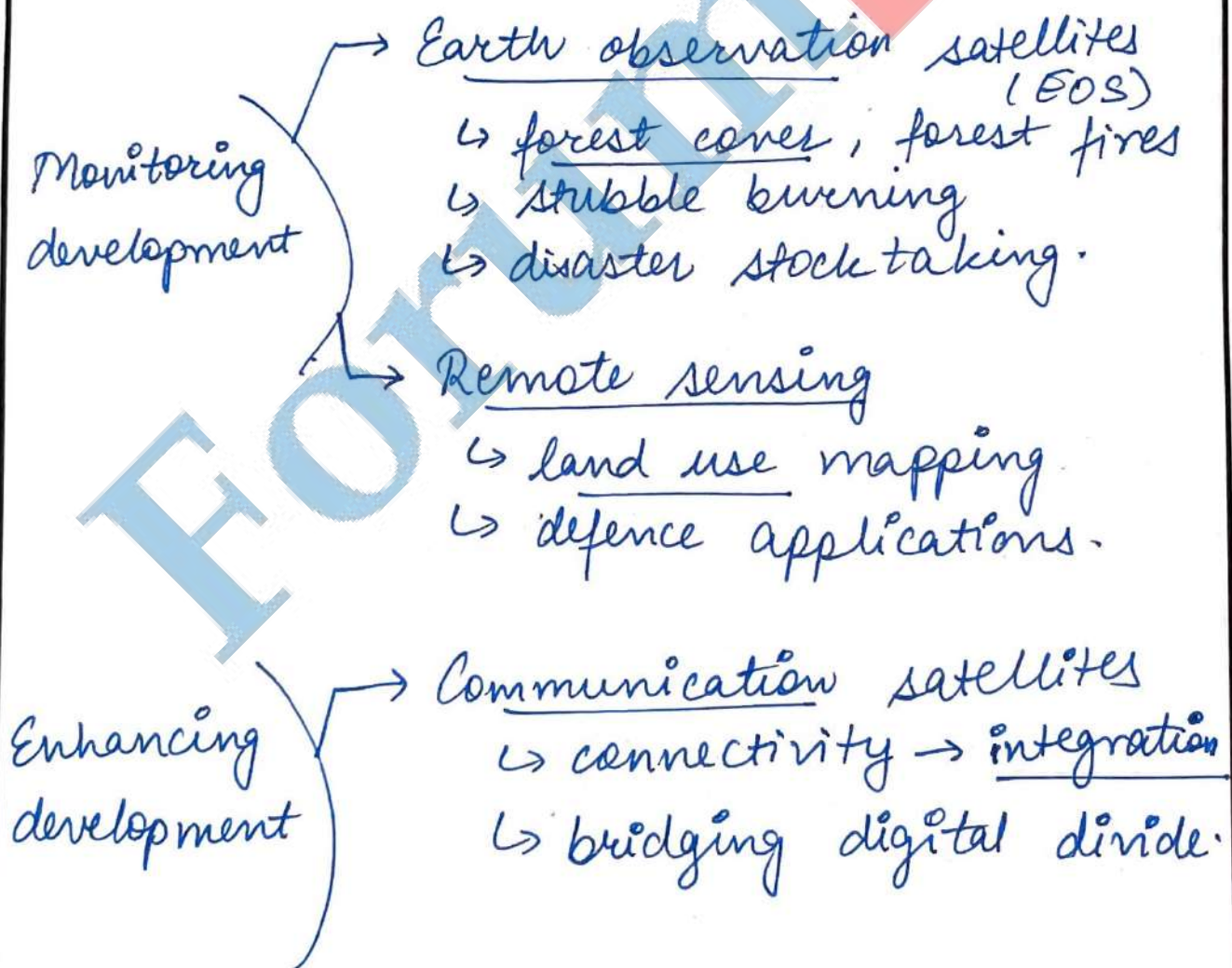
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Q.3) Space based technologies are helpful in not only monitoring development, but also enhancing it. Discuss. (10 marks, 150 words)

अंतरिक्ष आधारित प्रौद्योगिकियां न केवल विकास की निगरानी करने में सहायक हैं, बल्कि इसे बढ़ाने में भी सहायक हैं। चर्चा कीजिए। (10 अंक, 150 शब्द)

India has good space capabilities, evident from successful ambitious missions like Mangalyaan. Besides science, space technologies also have developmental applications —



↳ weather forecasting leveraging atmospheric + ground data
 ↳ reservoirs } Early warning systems
 ↳ rivers . }

↳ space based internet
 → Digitally connect remote locations.
 → speed and efficiency.

With government's initiatives to engage private sector in space sector, the Innovations ^{they bring} will further enhance the developmental applications of space based technologies.

Feedback

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Q.4) Ensuring sustainable consumption and production patterns for an environmentally conscious world is not possible without fundamental changes in lifestyle. Discuss this statement in light of Lifestyle for the Environment (LiFE) Movement. (10 marks, 150 words)

जीवन शैली में मूलभूत परिवर्तन लाए बिना पर्यावरण के प्रति जागरूक दुनिया के लिए सतत उपभोग और उत्पादन पैटर्न सुनिश्चित करना संभव नहीं है। पर्यावरण के लिए जीवन शैली (LiFE) आंदोलन के आलोक में इस कथन की चर्चा कीजिए। (10 अंक, 150 शब्द)

SDG 12 targets sustainable consumption and production patterns.

Towards this end, PM Modi advocated for a "Lifestyle for Environment" at Glasgow Summit. (LiFE)

Necessity of lifestyle changes for sustainability

① Huge scope of reducing carbon emissions -

[ex] 1/3rd energy used for heating & cooling.

[ex] Transport sector - significantly uses fossil fuels.

② Waste management

↳ adopting 3R's - Reduce, Reuse, Recycle

ex) India produces 3.5 million tonnes of plastics annually.

② Adoption of eco-friendly products

ex) natural fibres instead of artificial polymers.

ex) bamboo straws instead of plastic
↳ biodegradable.

As per a study, our current lifestyle (global average) requires "two earths" to sustain. There is an urgency to adopt sustainable lifestyle by using traditional wisdom, technological advancements and a sense of responsibility and cooperation.

Feedback

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Q.5) Managing risks, rather than impacts, lies at the core of effective disaster management strategy. In light of this statement, describe the flood risk profile of India and evaluate preparedness for effective flood management. (10 marks, 150 words)

प्रभावों के बजाय जोखिमों का प्रबंधन, प्रभावी आपदा प्रबंधन रणनीति के मूल में निहित है। इस कथन के आलोक में, भारत के बाढ़ जोखिम प्रोफाइल का वर्णन करें और प्रभावी बाढ़ प्रबंधन के लिए तैयारियों का मूल्यांकन करें।

(10 अंक, 150 शब्द)

Around 12% area of Indian landmass is prone to floods. Managing risks rather than impacts is important as a preventive and mitigation measure.

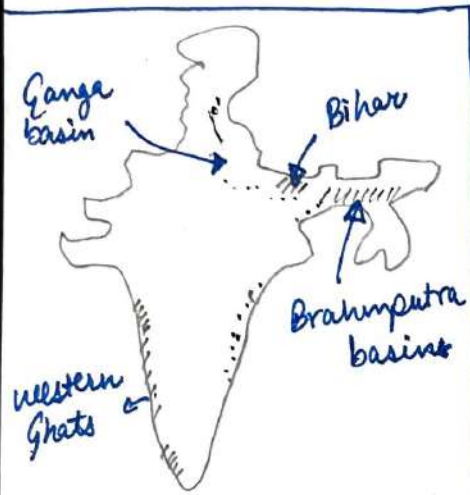


Fig: Flood prone areas

Flood Risk Profile of India

- ① Brahmaputra river basin
 - ↳ large, fast
 - ↳ siltation issues
 - ↳ frequently shifting
- ② Western Ghats
 - ↳ high rainfall.
- ③ Himalayas
 - ↳ cloudbursts [ex] Amarnath (J&K).
 - ↳ Glacial Lake Outburst Floods (GLOFs) [ex] Chamoli (Uttarakhand) 2021.

Preparedness for flood Management

- (i) Early warning systems (now with Doppler radars)
 - ex) IMD - rainfall;
 - ewc - floods.
- (ii) Response teams on stand-by
 - ex) quick response during Assam 2022 floods.
- (iii) Institutional structure in place for immediate relief and assistance.
- (iv) Satellite communication channels.

However, there are certain gaps —

- ① Community capacity building inadequate
 - ↳ first responders
 - ex) fishermen rescued many in 2018 Kerala floods
- ② Satellite communication coverage low.
- ③ Construction practices not conducive to quick recovery
 - ex) obstruct receding flood waters.

There is a need to focus on mitigation and adaptation, given IPCC warning of increased expected occurrence of floods.

Feedback

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Q.6) Solar power sector is not only leading the mitigation efforts against climate change, but the innovations in solar power can also accelerate adaptation of agriculture to a new reality of changed climate. Discuss. (10 marks, 150 words)

सौर ऊर्जा क्षेत्र न केवल जलवायु परिवर्तन के खिलाफ शमन प्रयासों का नेतृत्व कर रहा है, बल्कि सौर ऊर्जा में नवाचार भी बदली हुई जलवायु की एक नई वास्तविकता के लिए कृषि के अनुकूलन में तेजी ला सकते हैं। चर्चा करें।

(10 अंक, 150 शब्द)

Solar power currently accounts for about 13% of India's total installed power capacity.

Contributions to mitigating climate change

① Renewable energy

↳ Sun - inexhaustible source of energy.

② Decentralised energy

↳ lesser transmission losses ⇒ greater efficiency.

③ Most feasible for "retail" adoption

☑ solar rooftop panels -

☑ agri solar pump sets under PM-KUSUM

⇒ increased common man participation in climate change fight.

Potential to accelerate adaption in Agriculture

① Energy intensive agriculture can be supported.

☐ precision agriculture — to save water
 ↓
 (adaptation)

② utilization of barren lands for solar power generation.

③ Additional source of income (as envisaged under PM-KUSUM)
 ↳ to hedge crop failure risks due to climate change.

Solar revolution can help make agriculture self-reliant and also help wean farmers away from the need of power subsidies, helping in "sustainable agriculture".

Feedback

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Q.7) Necessitated by contingent law & order situation in the North-Eastern states in 1958, Armed Forces (Special Powers) Act (AFSPA) continues to be applicable even after six decades of its enactment despite widespread criticism. Critically evaluate the utility of AFSPA in light of prevailing security environment in the country. (10 marks, 150 words)

1958 में उत्तर-पूर्वी राज्यों में आकस्मिक कानून और व्यवस्था की स्थिति के कारण, सशस्त्र बल (विशेष अधिकार) अधिनियम (AFSPA) व्यापक आलोचना के बावजूद इसके लागू होने के छह दशकों के बाद भी लागू है। देश में प्रचलित सुरक्षा वातावरण के आलोक में AFSPA की उपयोगिता का समालोचनात्मक मूल्यांकन कीजिए। (10 अंक, 150 शब्द)

AFSPA is a special-power-~~bes~~ to Armed forces legislation applicable in areas declared "disturbed".

Recently, this list of "disturbed areas" was shrunk, thereby removing AFSPA from the delisted areas.

Continuing Utility of AFSPA

- some parts of North East still under insurgency -
[ex] Nagaland -
- Prevalence of "Parallel Governments" makes ordinary Law & Order ineffective.
- cross border infiltrations [ex] Myanmar border -
- Refugee crisis

Concerns with AFSPA

- Absolute power and protection
 - ↳ grants immunity to armed forces.
 - ↳ power to kill (post just one warning)
- Instances of misuse on civilians reported.
- Impunity sometimes leads to error of judgement (utmost caution not observed)
- Recent Mon killings (Nagaland) sense of alienation - "us vs them" feeling

Way forward

- * Bare minimum application (2nd ARC recommendation)
- * provisions like informing local police must be strictly complied with -
- * Any malafide use of power should be severely punished.

Feedback
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Q.8) Why has fake news on the internet emerged as an internal security challenge? How can we identify a fake news? Also, throw light on legal and institutional arrangements to tackle fake news.

(10 marks, 150 words)

इंटरनेट पर फेक न्यूज आंतरिक सुरक्षा चुनौती के रूप में क्यों उभरी हैं? हम एक फेक न्यूज की पहचान कैसे कर सकते हैं? साथ ही, फेक न्यूज से निपटने के लिए कानूनी और संस्थागत व्यवस्थाओं पर प्रकाश डालें। (10 अंक, 150 शब्द)

Fake news is any piece of information circulating on digital media which is false (deliberately or unintended).

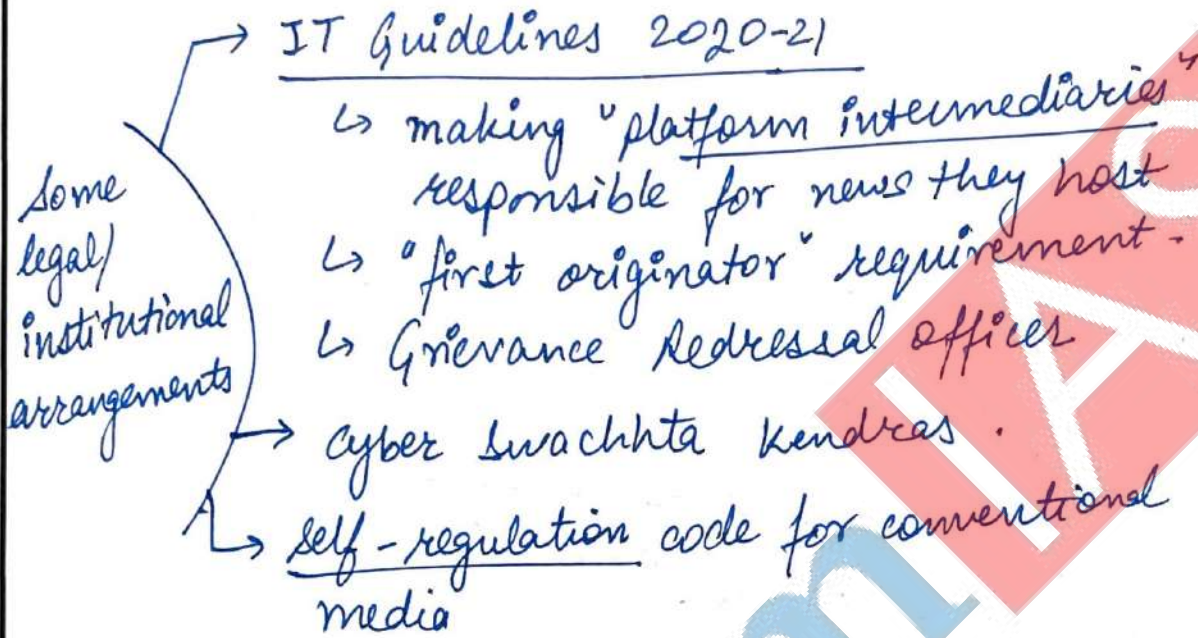
Fake News
— Internal Security Challenge

- Mob lynchings incidents
ex) TN "WhatsApp" lynchings
- fake polarising content for disturbing social harmony
ex) consent marriage shown as love jihad.
- conspiracy theories against government established by law
⇒ destabilising effect.

Identification of fake news

- ① follow government's authorized handles
ex) PIB's fake news busting twitter posts
- ② cross checking with authentic sources wherever possible.

③ Initiatives like Alt News - using technology to identify fake news.



Given the rising menace of fake news, there is a need to move from "Trust, but verify" to "Never Trust, Always verify" approach.

Feedback

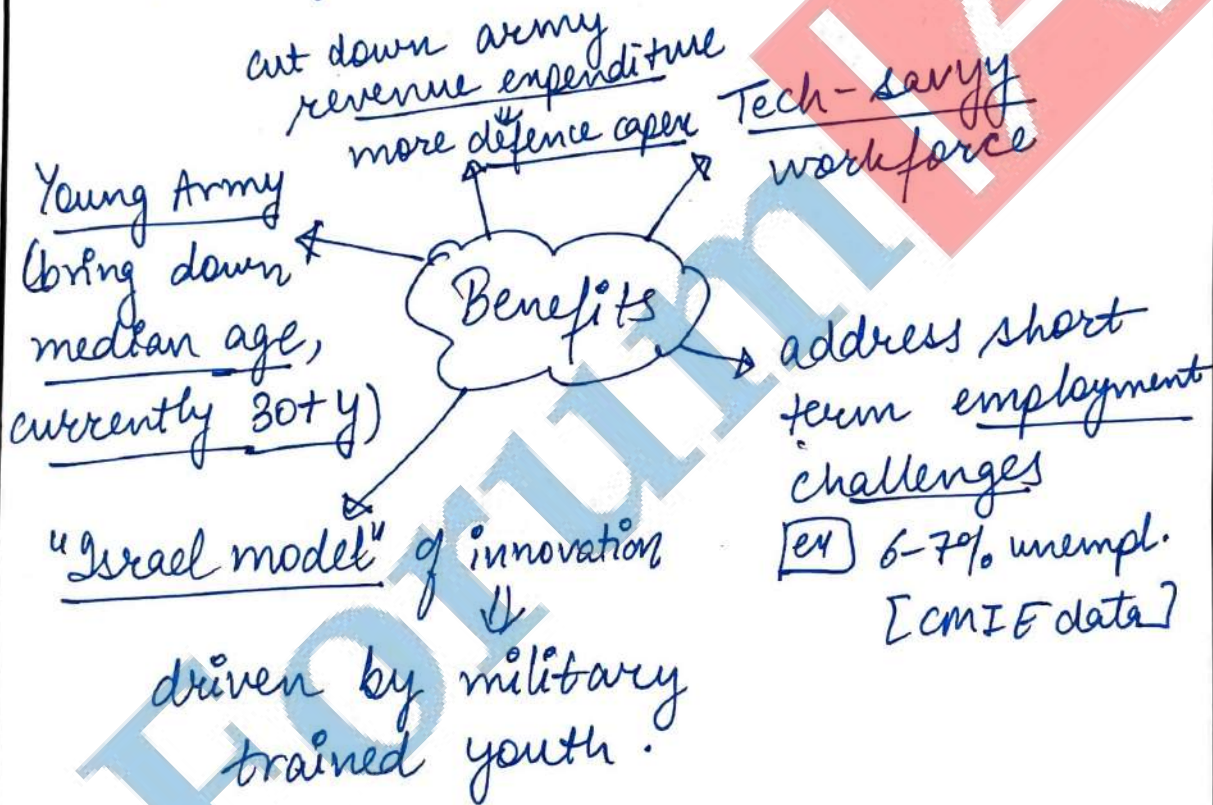
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Q.9) Discuss the salient features of Agnipath scheme. Underlining the benefits of the scheme, mention ways to overcome associated challenges. (10 marks, 150 words)

अग्निपथ योजना की मुख्य विशेषताओं की चर्चा कीजिए। योजना के लाभों को रेखांकित करते हुए, संबंधित चुनौतियों को दूर करने के तरीकों का उल्लेख करें। (10 अंक, 150 शब्द)

Agnipath scheme is the new Army recruitment scheme to induct 17-19y youth for four years into the service.



However, some experts have expressed

concerns —

- ① No job security → desperation to get full time position (top 25%) → corruption within Armed forces

- ② Rs. 12 lakh lump sum release package — insufficient to even start something up.
- ③ law and order concerns — "military trained unemployed youth".
- ④ Break in academics — may not pursue further — more low/semiskilled labour.

Way forward —

- Pilot run and consequent improvisation
- post 4-year avenues for released cadre like bridge courses, etc.
- Start-up ecosystem support to effectively realize the "Israel Model".

Feedback

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Q.10) Examine how advancements in technology has allowed organize crime syndicates to not only expand but also diversify their activities. Also recommend suitable measures to tackle the menace of organized crime. (10 marks, 150 words)

परीक्षण करें कि कैसे प्रौद्योगिकी में प्रगति ने संगठित अपराध सिंडिकेट को न केवल विस्तार करने बल्कि उनकी गतिविधियों में विविधता लाने की भी अनुमति दी है। संगठित अपराध के खतरे से निपटने के लिए उपयुक्त उपायों की भी सिफारिश करें। (10 अंक, 150 शब्द)

Organized Crime refers to criminal enterprises working to profit from illicit activities - [Ex] - drug trafficking

Technology aiding Expansion

- wider reach - global operations
- "Ease of business"
[ex] using cryptocurrency
- places like Darknet have become hotbed marketplaces for organized crime.

Technology aiding Diversification

- Newer forms of crime
[ex] extortion through cyberattacks
- [ex] Cryptocurrency rackets
- Antiquities trafficking now diversified to "Digital Art".

↳ Technology enables seamless operations

measures to tackle -

- ① Global coordination → on cyber security.
 - ↳ on anti money laundering
 - ↳ repatriate fugitives
- ② Improved intelligence sharing mechanism
- ③ Digitisation of procedures
 - ↳ digital payments — weakening hawala networks.
- ④ Border security controls to check drug / human / cattle trafficking

Feedback
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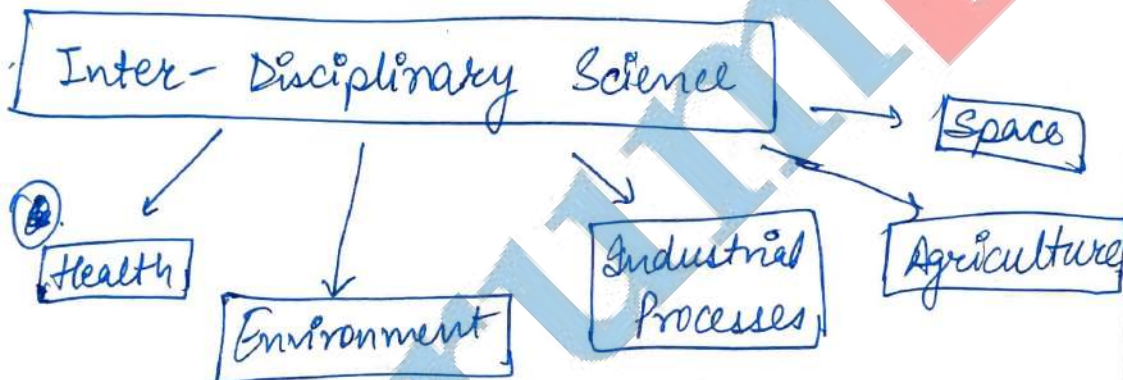
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Q.11) Nanotechnology is an inter-disciplinary and inter-connected science that has revolutionary applications across sectors. In this perspective, discuss the relevance of nanotechnology for socio-economic development in the country. (15 marks, 250 words)

नैनोटेक्नोलॉजी एक अंतर-अनुशासनात्मक और परस्पर जुड़ा हुआ विज्ञान है जिसके सभी क्षेत्रों में क्रांतिकारी अनुप्रयोग हैं। इस परिप्रेक्ष्य में, देश में सामाजिक-आर्थिक विकास के लिए नैनो प्रौद्योगिकी की प्रासंगिकता पर चर्चा करें।

(15 अंक, 250 शब्द)

Nanotechnology refers to the technique of using nano-sized particles ($\sim 10^{-9}$ m order) for various real-life applications.



Relevance for Socio-Economic Development

1. HEALTH Sector

↳ Nanobots for targeted drugs

↳ for de-clogging arteries

↳ Nanobots to monitor health parameters like blood count.

2° AGRICULTURE Sector

↳ Precision technologies [ex] nano sized pesticide spray

↳ Efficiency of resources.

[ex] Nano-urea.

↳ Nanosensors for measuring soil parameters

- moisture
- nutrients
- microbes.

3° INDUSTRY

↳ use of nano-fibres for enhancing strength and durability.

[ex] variants of plastics

↳ use in metallurgical processes

4. ENVIRONMENT

- ↳ using nano-particles to enhance solar panel efficiency.
- ↳ phytoremediation techniques to decontaminate toxic pollutants.

5. SPACE

- ↳ nanosheets of reflective materials to maintain satellite temperatures.
- ↳ nanoparticles to filter selective radiations.

Nanotechnology has immense applications that can revamp and improvise many human processes. There's a huge scope, provided we invest in research in the domain.

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(For OFFIC)

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Q.12) The increasing demand for stronger Intellectual Property Rights (IPR) protections is motivated by a desire to invigorate a groundswell of innovation, but it is more likely to lead towards IP monopolies. Examine. (15 marks, 250 words)

मजबूत बौद्धिक संपदा अधिकार (IPR) सुरक्षा की बढ़ती मांग नवाचार के आधार को मजबूत करने की इच्छा से प्रेरित है, लेकिन इससे बौद्धिक संपदा (IPR) के एकाधिकार की ओर ले जाने की अधिक संभावना है। परीक्षण करें।

(15 अंक, 250 शब्द)

Intellectual Property Rights (IPR) are rights of exclusivity granted to the original creator of a product/process/innovation.

Internationally, IPR is governed by WTO's TRIPS agreement.

Need - to invigorate Innovation

- ① Incentivising new research.
- ② Helps a researcher break-even from his initial investments.
- ③ Creates a fair market — because "innovation costs" are much higher than "copying costs"
↳ so, original creators need protection.

However, there are certain challenges associated with IPR regime —

① MONOPOLISATION

↳ patent holder has "exclusive rights" for few years.

↳ "Evergreening" of patents — unfair practice to retain monopoly

② Ethical Issues

↳ If humanity has the solution to a problem, should it be denied on IPR grounds?

↳ Ex covid - vaccines.

③ Extortionary market

↳ Patent holders exploit monopoly - charge huge prices.

↳ Ex Africa HIV issue in 1990s

(US Pharma company refused to slash prices for drug)

To address some of these challenges, there are certain mechanisms created —

- ① Compulsory licensing regime
(exception under WTO-TRIPS to sovereign nations)
- ② Process - patent (trade secret) vs product patent distinction.
- ③ Voluntary licencing route — based on mutual consensus between patent holder and industrial actor.

But, as is evident from the IPR - hurdles that came in the way of tackling covid, more mechanisms need to be in place to ensure pat fairness to patent holders as well as benefits to humanity at large.

Feedback

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| Structure/ Presentation |
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Q.13) New age digital technologies are creating disruptions that open fascinating opportunities and pose frightening threats. Give an account of how digital disruptive technologies are changing our lives. (15 marks, 250 words)

नए जमाने की डिजिटल प्रौद्योगिकियां व्यवधान पैदा कर रही हैं जो आकर्षक अवसरों को खोलती हैं और भयावह खतरे पैदा करती हैं। डिजिटल डिसरप्टिव प्रौद्योगिकियां हमारे जीवन को कैसे बदल रही हैं, उनका लेखा-जोखा दीजिए।

(15 अंक, 250 शब्द)

Technology is a double-edged sword — with most technologies well intended, being used for perverse purposes as well.

Digital technologies — opening opportunities

① Artificial Intelligence (AI)

- ↳ Precision Agriculture
- ↳ Smart defence using Computer vision
- ↳ Healthcare [ex] Genome project
- ↳ Automation [ex] self driving cars; IR4.0
- ↳ Ease of living → Internet of things.

② Social Media

- ↳ democratization of public space for debate
- ↳ connectivity
- ↳ exposure to new ideas, practices.

③ Blockchain Technology

- ↳ decentralised, secure data storage.
- [ex] land records.
- ↳ tamperproof \Rightarrow security
- [ex] central bank digital currency.

④ Web 3.0 (futuristic technology)

- ↳ data privacy, security
- ↳ decentralised control \rightarrow no intermediaries

However, these technologies also pose

Frightening risks

① AI

- ↳ surveillance
- [ex] using CCTVs in public places.
- ↳ defence vulnerabilities \rightarrow hybrid warfare
- ↳ lethal autonomous weapon systems.
- ↳ scope of errors
- [ex] self-driving cars \rightarrow algorithmic malfunction \rightarrow large scale accidents.

② Social Media

- ↳ profiling of citizens ;
interference in democratic processes
[ex] Cambridge Analytica case.
- ↳ echo-chambers and polarisation
- ↳ amplifying hateful content
[ex] Tek-fog app.

③ Blockchain

- ↳ cryptocurrencies - used in organized crime ; challenges monetary sovereignty

There is a need for agility in responding to new disruptions of latest technologies to evolve and improvise regulatory framework to check misuse.

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Q.14) Single use plastic (SUP) is a health, economic and environmental scourge, that requires governments to regulate, businesses to innovate and individuals to act. Examine in context of recently introduced ban on SUPs. (15 marks, 250 words)

सिंगल यूज प्लास्टिक (SUP) स्वास्थ्य, आर्थिक और पर्यावरणीय संकट है, जिसके लिए सरकारों को विनियमित करने, व्यवसायों को नवाचार करने और व्यक्तिगत रूप से कार्य करने की आवश्यकता होती है। सिंगल यूज प्लास्टिक पर हाल ही में शुरू किए गए प्रतिबंध के संदर्भ में परीक्षण करें। (15 अंक, 250 शब्द)

Single Use Plastics are the plastics with one-time utility and high littering potential.

Impacts of Single Use Plastics (SUPs)

① Health

- ↳ ingested by animals → suffocation
- ↳ ex cow deaths due to starvation because of stomach full of plastic
- ↳ surface for thriving microbes → source of diseases like cholera.

② Economic

- ↳ waste management cost — high
- ↳ no reuse ⇒ less utility for same price.

③ Environmental

↳ pollution — water, soil, air

↳ affects wildlife health

[ex] birds dying due to choking.

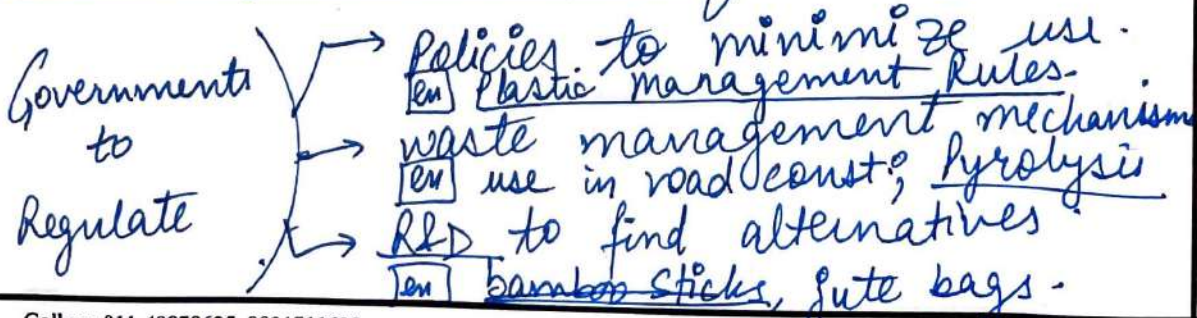
↳ not biodegradable → piling landfills

[ex] Ghaziपुर landfill

In this context, the government recently came out with rules banning SUPs —

- items like plastics straws, earbud sticks, etc. banned.
- ^{minimum} plastic thickness for bags to be raised to 120 microns year end.
- production, use, import, stocking — liable to punishment.

Tackling the menace of SUPs



Businesses to Innovate

- find sustainable alternatives
- [en] Project Replan (KVIC)
- innovative mechanisms to take back their plastics
- [en] EPR mechanism outsourcing (Norway model).

Individuals to Act

- lifestyle changes
- [en] bulk purchase of products instead of sachets.
- complying with waste segregation guidelines
- raising general awareness
- [en] NGOs like Fridays for future.

India generates 3.5 mn tonnes plastic annually, of which only 10% is recycled, with the rest in landfills, rivers and oceans. There is a need to adopt 4Rs - Refuse, Reduce, Reuse, Recycle for benefit of all ("One world One Health")

Feedback
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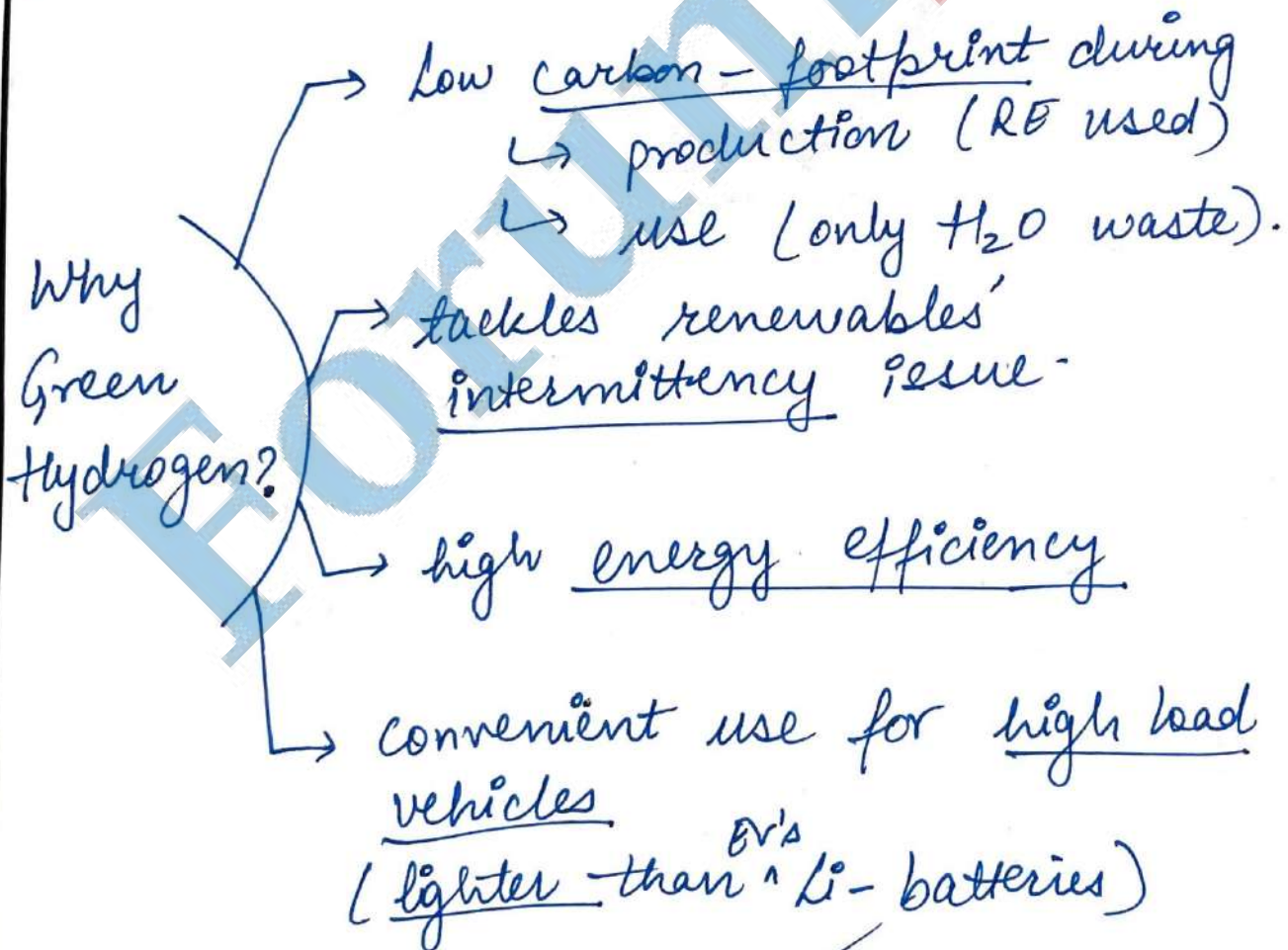
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Q.15) Green hydrogen can be the engine of a sustainable economy, but it would require crossing financial and technological barriers. Discuss the reasons for increasing interest in green hydrogen and challenges in its adoption as the fuel of the future. (15 marks, 250 words)

ग्रीन हाइड्रोजन एक स्थायी अर्थव्यवस्था का इंजन हो सकता है, लेकिन इसके लिए वित्तीय और तकनीकी बाधाओं को पार करना होगा। ग्रीन हाइड्रोजन में बढ़ती रुचि के कारणों और भविष्य के ईंधन के रूप में इसे अपनाने में चुनौतियों की चर्चा करें। (15 अंक, 250 शब्द)

Green Hydrogen refers to production of Hydrogen using renewable energy.

Currently, only 1% of total Hydrogen produced is Green Hydrogen.



Green Hydrogen has a promising potential, but there are currently challenges in its adoption —

[A] FINANCIAL Barriers

- ↳ R&D costs
- ↳ needs infrastructure ecosystem
 - [ex] — refuel stations,
 - [ex] — decentralised production to harness renewables potential fully.
- ↳ Industry transition will be cost intensive.

[B] TECHNOLOGICAL Barriers

- ↳ flammable — safety concerns (plus odourless and colorless — hard to detect)
- ↳ retrofitting industries will be a technological challenge.

To address some of these, the government has come up with various initiatives like —

★ National Hydrogen Mission

★ Research partnerships

[ex] India us } clean Energy partnerships
India Japan }

★ Increasing renewable energy capacity

[ex] target 450 GW by 2030 (Glasgow).

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Feedb
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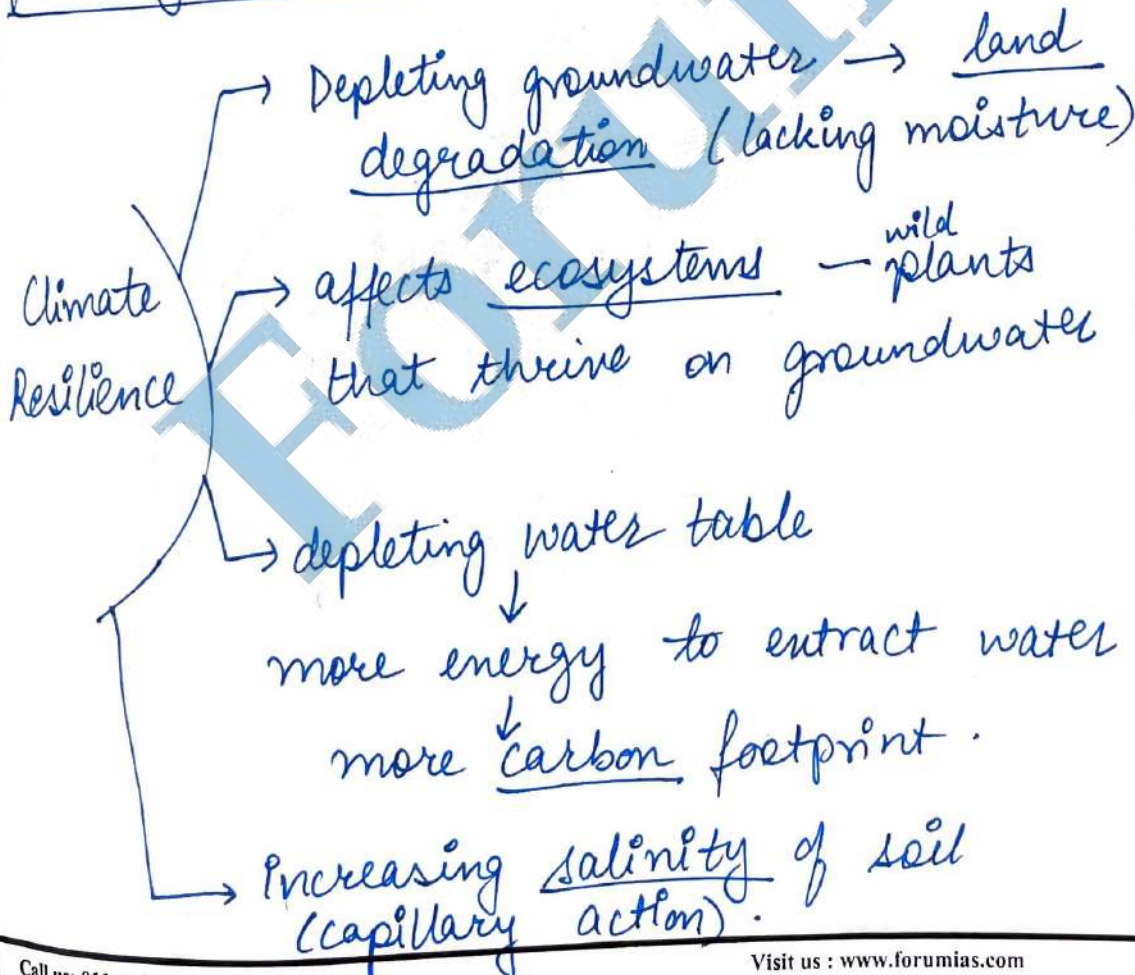
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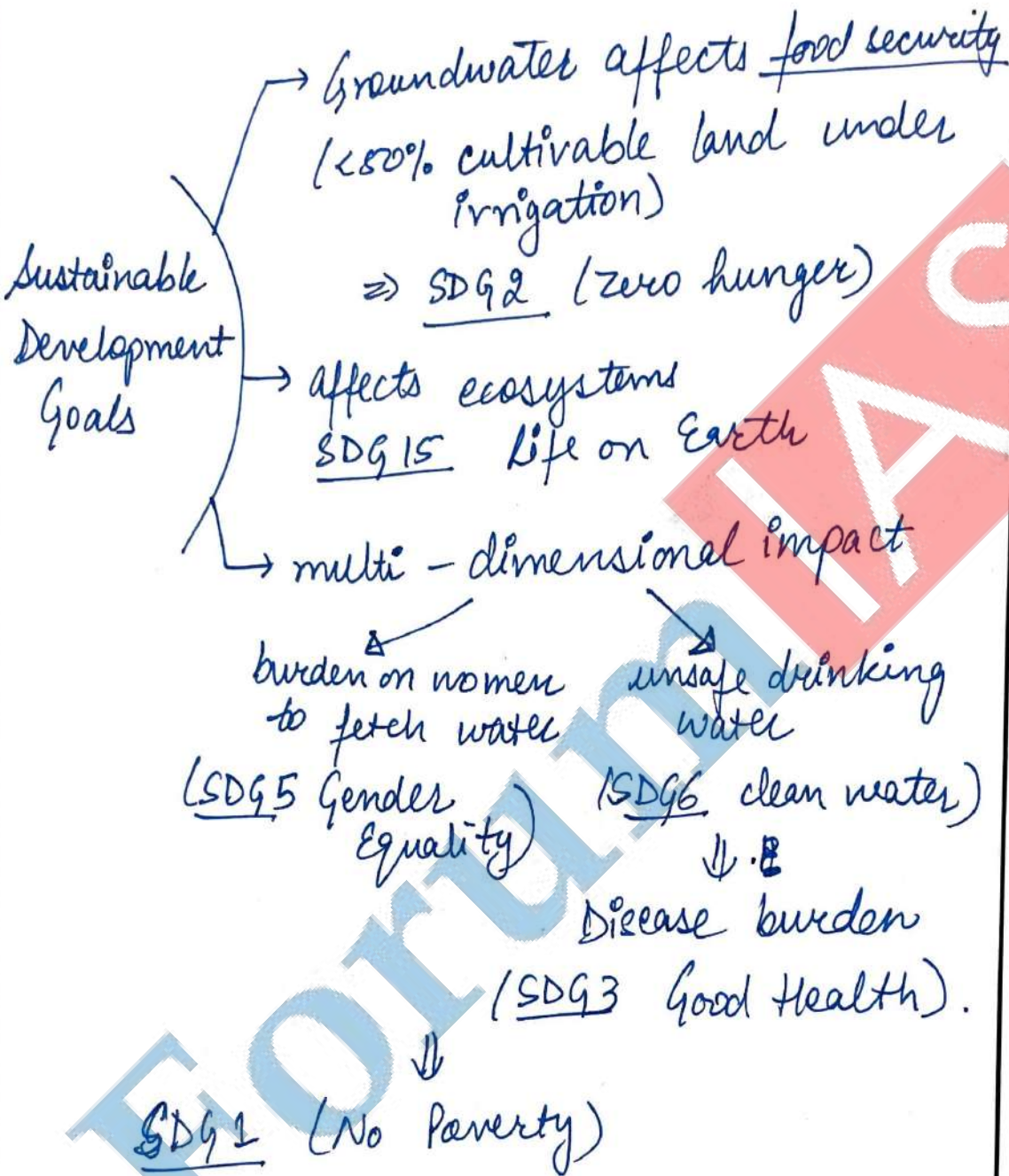
Q.16) Making the invisible groundwater visible is critical for building climate resilience and achieving sustainable development goals. Examine. (15 marks, 250 words)

अदृश्य भूजल को दृश्यमान बनाना जलवायु को लचीलापन बनाने और सतत विकास लक्ष्यों को प्राप्त करने के लिए महत्वपूर्ण है। परीक्षण कीजिए। (15 अंक, 250 शब्द)

The Groundwater utilization rate of India is ~85% on average, which means we use 85% of the replenishment rate, with some north western states rate being ~130%

Need for Groundwaters Conservation
Making Groundwaters visible





How to make Groundwater visible?

① Sustainable use

↳ suitable cropping patterns

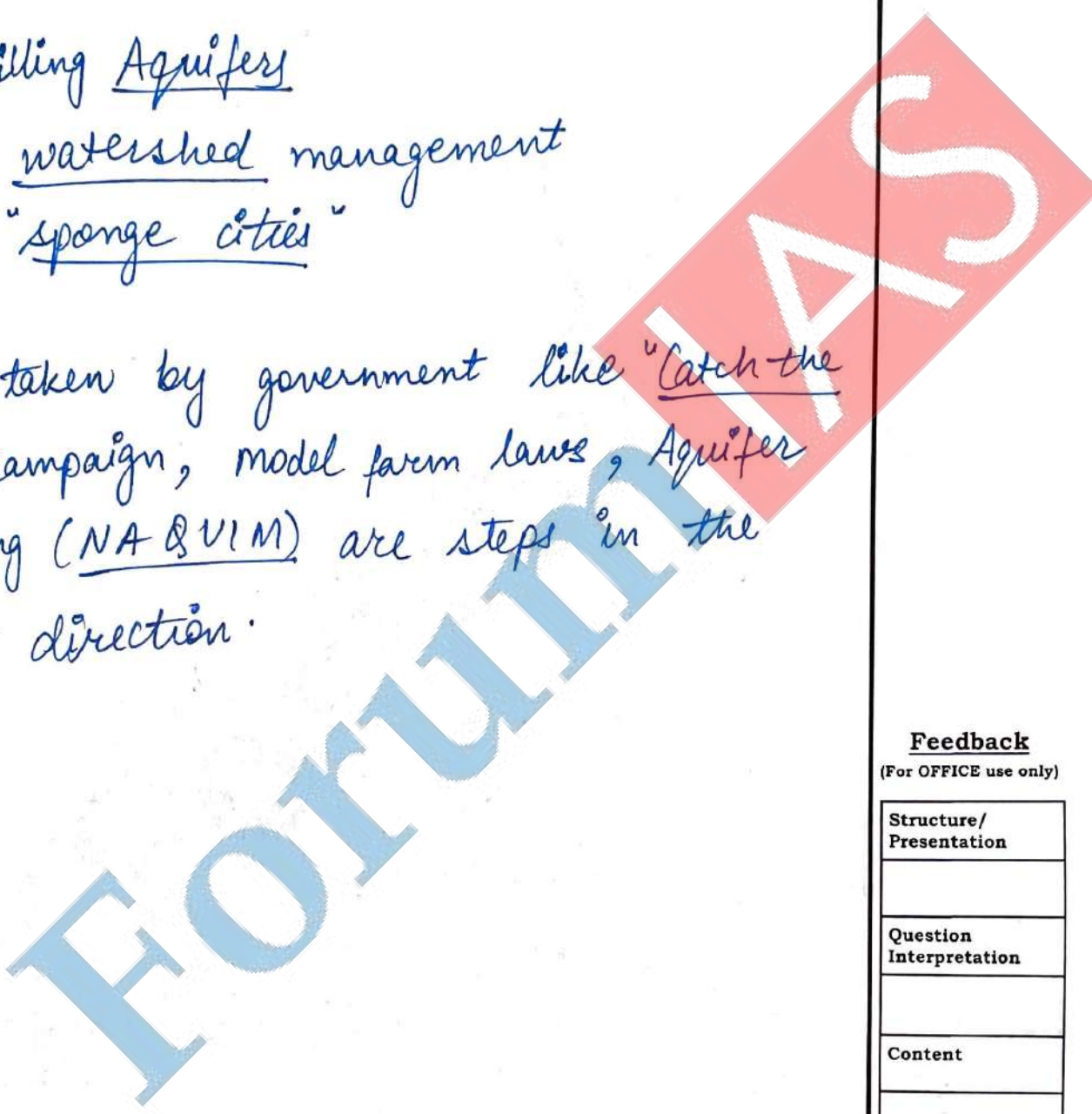
ex meaning Punjab/Haryana farmers away from Rice/wheat system.

↳ checking groundwater pollution through waste management; sewage water treatment.

② Refilling Aquifers

- ↳ watershed management
- ↳ "sponge cities"

Steps taken by government like "Catch the Rain" campaign, model farm laws, Aquifer mapping (NA & VIM) are steps in the right direction.



Feedback

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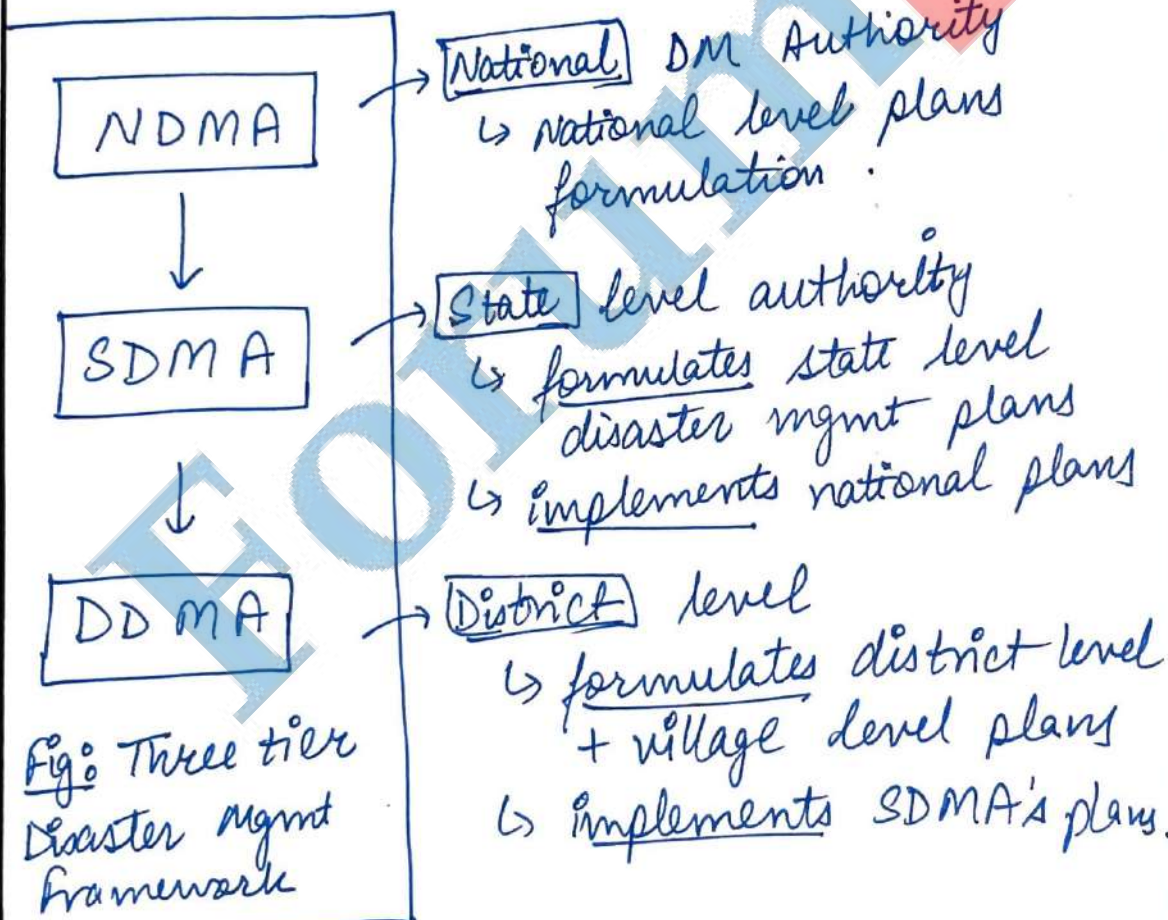
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Q.17) Despite the presence of a strong institutional framework and clearly stated policy, huge losses in terms of human, financial, environmental and livelihood show that India still struggles in effective management of disasters. Discuss the reasons for the gap between policy and practices related to disaster management in the country. (15 marks, 250 words)

एक मजबूत संस्थागत ढांचे और स्पष्ट रूप से बताई गई नीति की उपस्थिति के बावजूद, मानव, वित्तीय, पर्यावरण और आजीविका के मामले में भारी नुकसान दर्शाता है कि भारत अभी भी आपदाओं के प्रभावी प्रबंधन में संघर्ष कर रहा है। देश में आपदा प्रबंधन से संबंधित नीति और उनके कार्यान्वयन के बीच अंतर के कारणों की चर्चा करें। (15 अंक, 250 शब्द)

Disaster Management ^(DM) was provided with a strong institutional framework with the

Disaster Management Act 2005



Further, the government released —

- i) National Policy on Disaster Mgmt (2009)
- ii) National DM Plan (2016)

↳ along the lines of "Sendai Framework"

4 pillars —

- 1) Understanding disaster risk
- 2) Strengthening risk governance
- 3) investing in risk reduction
- 4) disaster preparedness

But despite the efforts, India still struggles in managing disaster effectively, evident from —

↳ recent events → Amarnath flash floods — casualties
 → NE (Assam) floods — displaced millions

↳ other events → Kedarnath (2013) floods — thousands died.
 → Kerala (Mukki) landslides (2018)
 → urban floods — Hyderabad (2021).
 Chennai (2015).

Reasons for gap between policy and practice:

① Poor enforcement

↳ no clear "one-point" authorities made responsible (2nd ARC highlighted)

↳ overlapping functions

[ex] IMD forecasts cyclones/ rains,
CWC responsible for floods.

↳ "Standard of Procedure" not available.

② Financing Issues

↳ National/ State Disaster Relief Funds
not popularised enough.

↳ no dedicated budget allocation —
more ad-hoc response.

③ "Community - centricity" is missing

↳ first responder

↳ traditional knowledge for coping
— not leveraged.

Having ~~so~~ been so, we've still come a long way
in minimizing casualties (ex. Amphan — <100).

2nd ARC recommendations for structural
reforms, and technology for community
participation can plug the remaining gaps.

Feedback

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Q.18) Present a brief account of various security forces deployed to protect India's terrestrial and maritime borders. Also, bring out various challenges faced by border security forces and suggest measures to effectively address them. (15 marks, 250 words)

भारत की स्थलीय और समुद्री सीमाओं की रक्षा के लिए तैनात विभिन्न सुरक्षा बलों का संक्षिप्त विवरण प्रस्तुत करें। साथ ही, सीमा सुरक्षा बलों के सामने आने वाली विभिन्न चुनौतियों को सामने लाएं और उन्हें प्रभावी ढंग से संबोधित करने के उपाय सुझाएं। (15 अंक, 250 शब्द)

India has a 7500km long maritime boundary and ~15000km long terrestrial border, guarded by the following security arrangement-

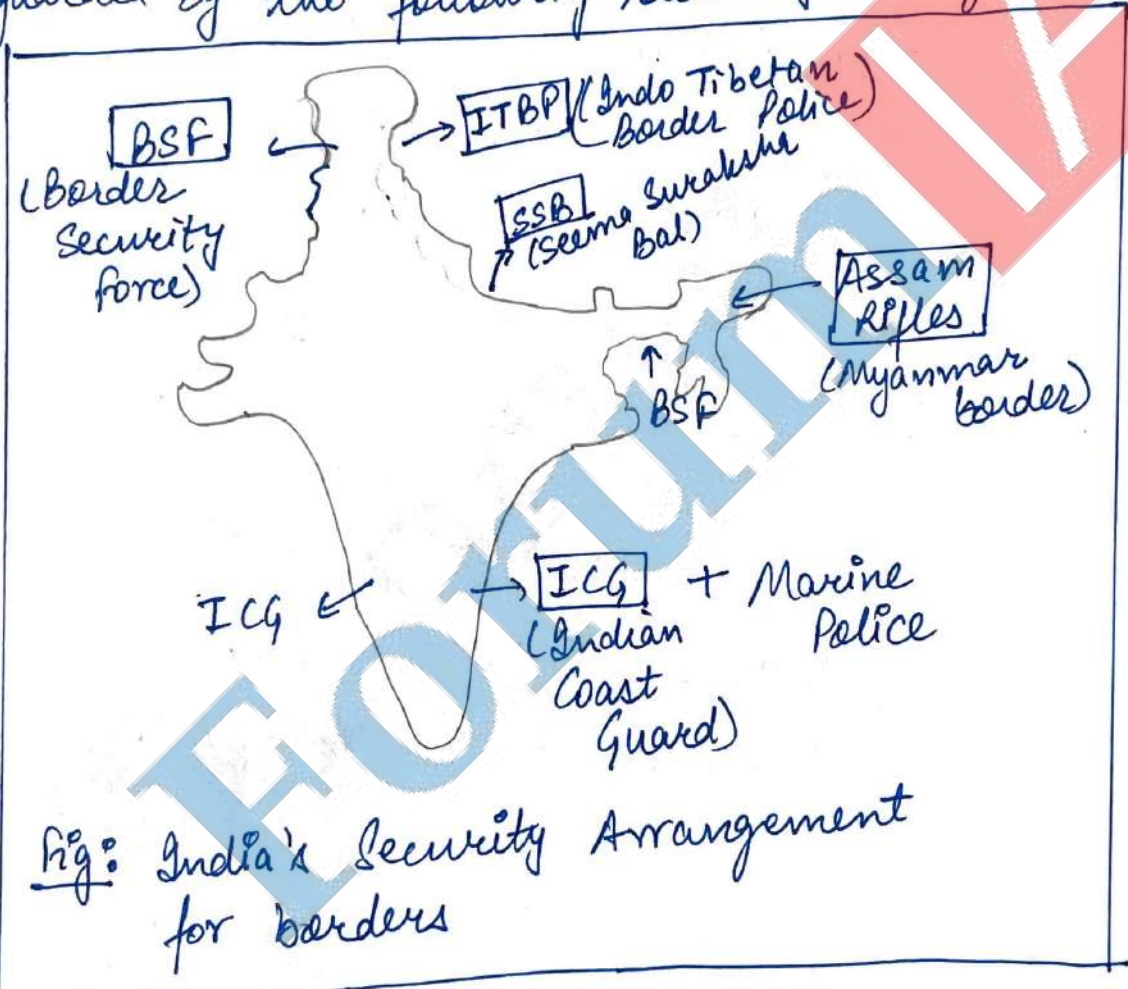
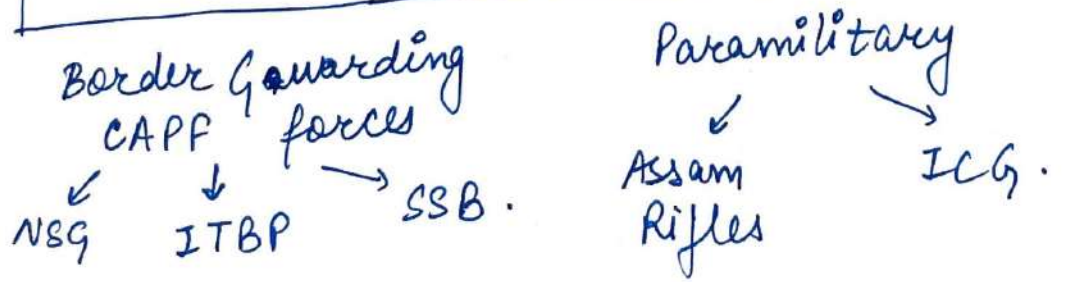


Fig: India's Security Arrangement for borders



Challenges

faced
by border
forces

- ① Geography - difficult terrains
- en Ladakh's freezing heights
 - en Bangladesh's riverine border
 - en North East - forested areas

② Hybrid warfare

- en Jammu drone attack
- en Guerilla attacks, lone wolf attacks in J&K.

③ Issues with State Administration

- ↳ sense of being sidelined in local police (en - North East, J&K.)
- ↳ clashes with locals
- en stone pelting in J&K.
- en anti AFSPA protests in NE.

Measures to address the challenges -

- ① Proper equipments to personnel
- ↳ to withstand cold
 - ↳ night vision cameras.

② Use of technology
 ↳ for better intelligence.
 ↳ drones or other UAVs for some dangerous operations.

③ "In-house" soldiers to be given due promotion incentives — boosts morale (vs IPS dominant culture)

④ better coordination with state police (better ground intelligence)

⑤ Reach out to civilians

EN Operation Sadbharna by Indian Army in J&K.

Feedback

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Q.19) In what ways management of maritime borders differ from that of territorial borders? Also, analyze various vulnerabilities that arise from a large maritime boundary of the country.

(15 marks, 250 words)

समुद्री सीमाओं का प्रबंधन किस प्रकार क्षेत्रीय सीमाओं से भिन्न है? इसके अलावा, देश की लंबी समुद्री सीमा से उत्पन्न होने वाली विभिन्न सुभेदताओं का विश्लेषण करें।

(15 अंक, 250 शब्द)

India has a 7500 km long maritime boundary, with hostile neighbours like Pakistan — making it imperative to guard maritime borders to prevent any 26/11 Mumbai type attacks.

Vulnerabilities from a long maritime boundary —

① Infiltration risk

ex Ajmal Kasab used sea route for 26/11 attacks.

② vast oceans

↳ difficult to navigate

↳ "no habitations" to give ground reports.

③ Organized crime

ex] drugs seized at Kandla port (2022)

ex] trafficking of humans, cattle.

④ Innocent fishermen from other countries may breach boundary limits
↳ needs a cautious approach.

In view of these ~~spe~~ maritime-specific vulnerabilities the management of maritime borders also differs from territorial borders in following ways —

| Terrestrial border management | Maritime border management |
|--|--|
| ① Demarcation easier ex] fencing ② <u>local inhabitants</u> — important source of information. | ① Demarcation (physical) impossible. ② No local people to assist. <u>fishermen</u> , to some extent, aid forces. |

| Terrestrial | Maritime |
|---|---|
| <p>③ customized <u>terrain specific training</u> required.</p> <p>④ work with state police with <u>overriding jurisdiction</u>.</p> <p><u>ex</u> BSF - exclusive jurisdiction upto 50km.</p> <p>⑤ Nature of attacks: ↳ IEDs, shelling, guerilla attacks</p> | <p>③ Homogeneous terrain - <u>coastline</u>, and high <u>seas</u>.</p> <p>④ coastal - work with Marine police - Seas - Indian Coast Guard - Indian Navy.</p> <p>⑤ Nature of attacks: ↳ largely infiltration and trafficking</p> |

Given recent developments like China's incursions in Sri Lankan ports, it has become more important to strengthen maritime surveillance -

Feedback
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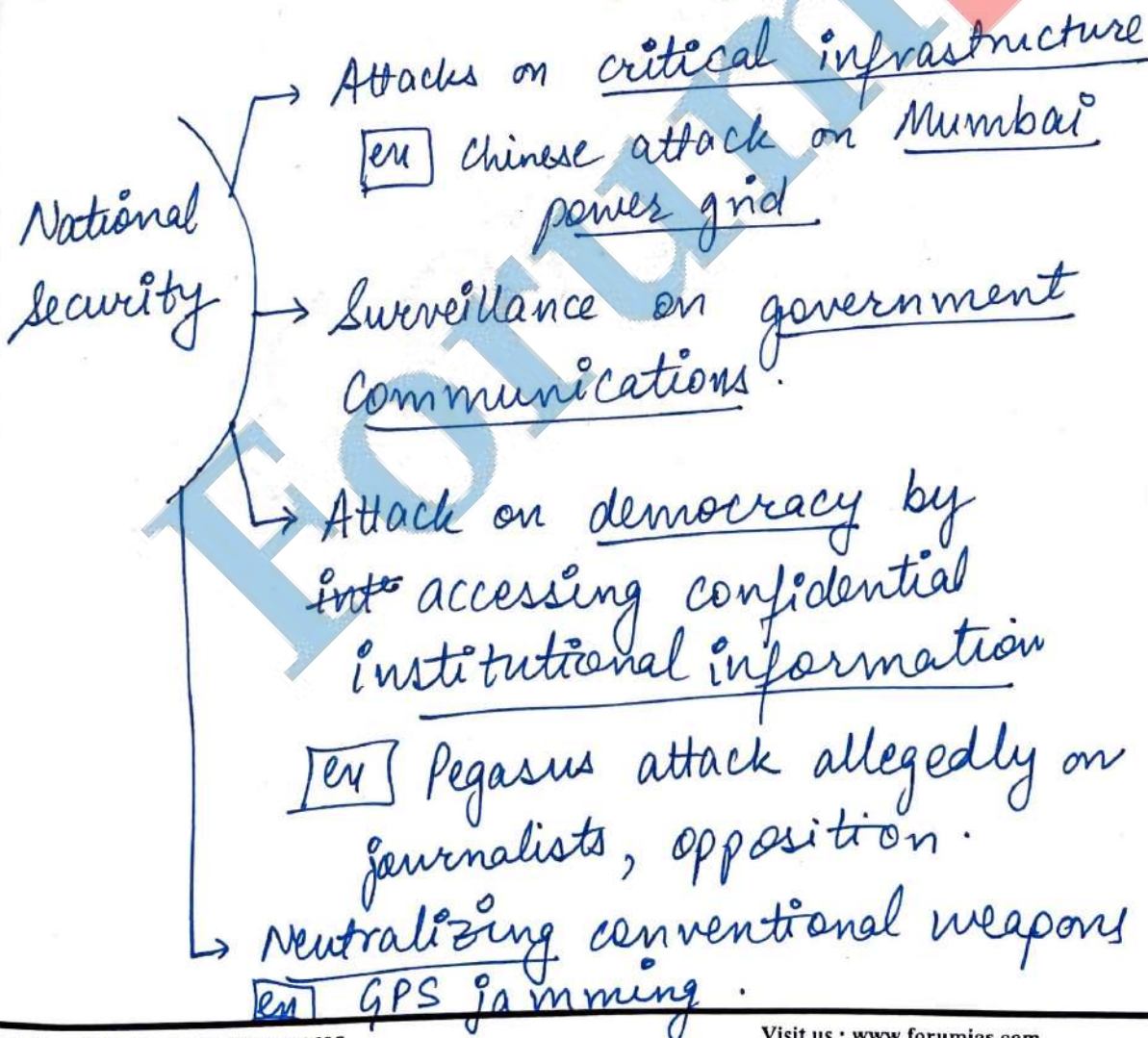
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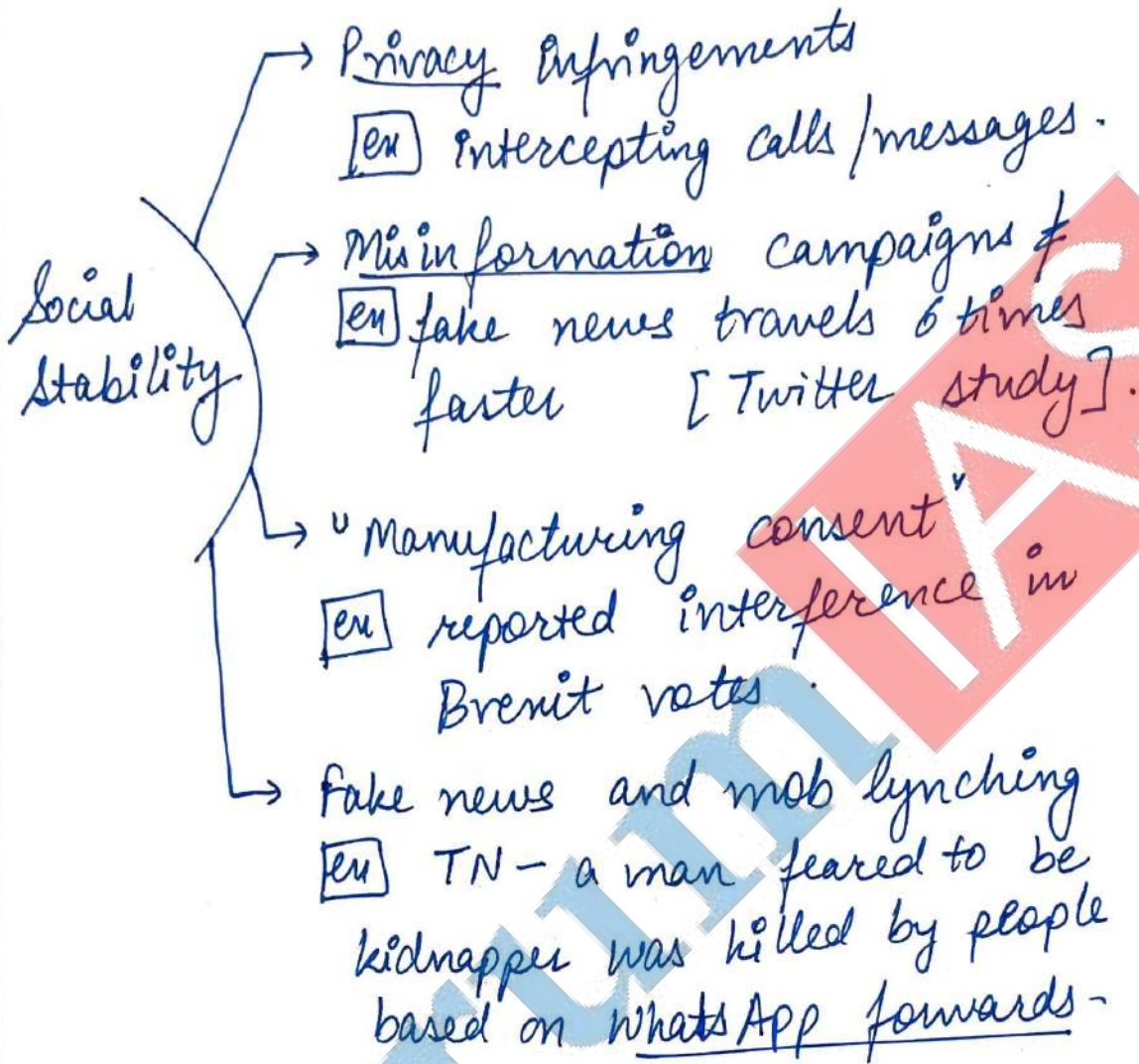
Q.20) Cyberthreats can wage a dual war on the state and citizens, disrupting the national security as well as social stability. Explain. (15 marks, 250 words)

साइबर धमकी राज्य और नागरिकों पर दोहरा युद्ध छेड़ सकती है, जिससे राष्ट्रीय सुरक्षा और सामाजिक स्थिरता बाधित हो सकती है। व्याख्या कीजिए। (15 अंक, 250 शब्द)

Cyberthreats refer to attacks using digital technologies capabilities like hacking, phishing, social media misinformation campaigns, etc.

"Dual War" nature of cyberthreats





To tackle these emerging challenges, some measures can be taken —

- 1) Offensive and defensive cyber capabilities
 - ↳ cyber secure communications
 - ↳ hack-proofing critical infrastructure

2) Regulation of social media

↳ to prevent misuse by external state/non-state actors

[ex] China's role in fuelling subversive activities in North East.

[ex] ISIS used social media for radicalizing some Indian youth.

3) Data Protection framework

[Justice Srikrishna Committee guidelines]

↳ local data storage

↳ privacy safeguards.

Technological advancements are taking us to 5th generation warfare tactics, for which constant safeguard review and upgradation needs to be done.

Feedback

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Mentor Feedback Questions

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- 2
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Test Goal

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Outcomes

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Marking Scheme

| Mark | Good | Average | Below average |
|-----------|----------------------|-----------|---------------|
| 10 Marker | 3.75 – 5.0 | 3.0 – 3.5 | < 3.0 |
| 15 Marker | 5.75 – 7.0 | 4.0 – 5.5 | < 4.0 |
| ✓✓ | Key / Relevant Point | | |
| ✗ | Vague / Irrelevant | | |

* Subject to change without prior notice.