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GENERAL STUDIES (TEST CODE : 1511)

Name of Candidate	Kunal Rastogi		
Medium Eng./Hindi	online	Registration Number	
Center	Home	Date	3/01/2022

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	
1	10		<p>1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code). उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।</p> <p>2. There are TWENTY questions printed in ENGLISH & HINDI इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।</p> <p>3. All questions are compulsory. सभी प्रश्न अनिवार्य हैं।</p> <p>4. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।</p> <p>5. 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. No marks will be given for answers written in medium other than the authorized one. प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।</p> <p>6. Word limit in questions, if specified, should be adhered to. प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।</p> <p>7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off. उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।</p>
2	10		
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20	15		
Total Marks Obtained:			
Remarks:			

16-B, 2nd Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

Plot No. 857, 1st Floor, Banda Bahadur Marg (Opp Punjab & Sindh Bank), Dr. Mukherjee Nagar
Delhi- 110009

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

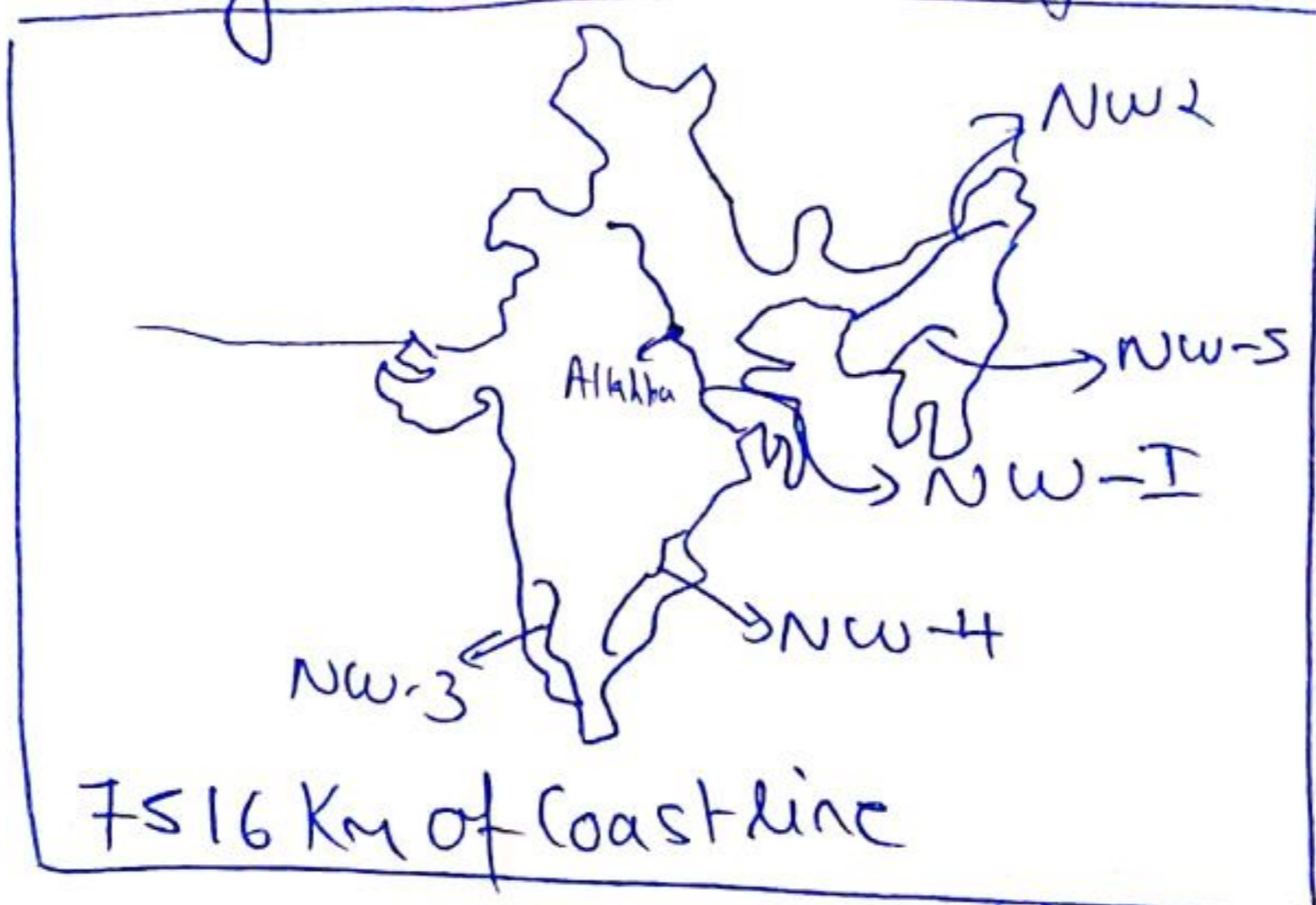
5.

6.

1. Despite a vast coast line and a number of waterways, why has India not been able to achieve its potential in bringing a significant modal shift from rail and road to waterways? (150 words) 10

विस्तृत तट रेखा और अनेक जलमार्गों के बावजूद, भारत रेल और सड़क परिवहन प्रणाली से जलमार्गों की दिशा में महत्वपूर्ण प्रणालीगत परिवर्तन (मोडल शिफ्ट) करने हेतु अपनी क्षमता को सार्थक करने में क्यों असमर्थ रहा है?

The cumulative freight & passenger transport from waterways is less than 2%. inspite of central govt. announcing 106 waterways



Challenges in modal shift

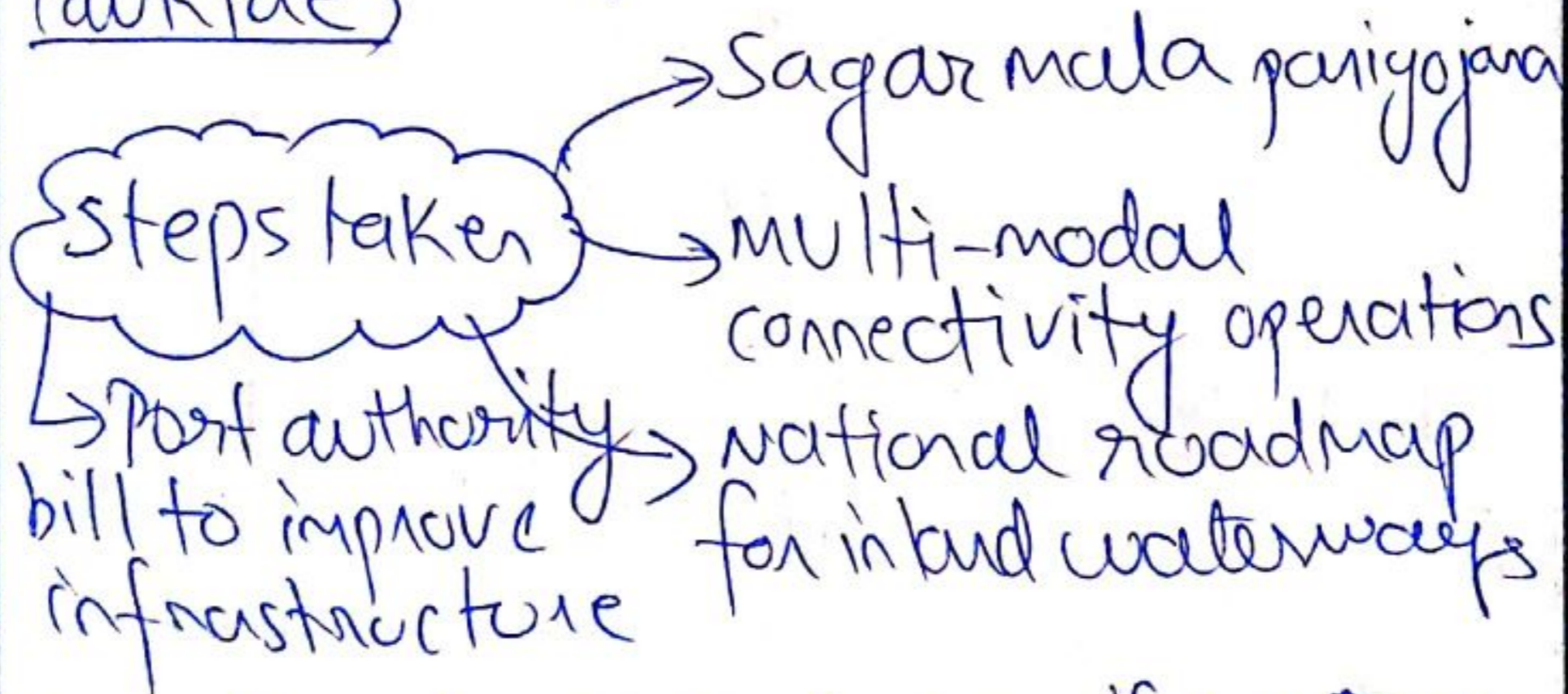
- ① lack of last mile connectivity due to unavailability of port and road infrastructure.
- ② lack of dredging operations, resulting in reduced depth. for (eg)

Jal shakti ministry → NW-I only 40% available for transport.

③ Reduced investment in technology and development of steamers and ships.

④ Availability of skilled workforce in train & roadways but not in waterways

⑤ Seasonal variation in depth of rivers and cyclones in sea due to climate changes. (for eg) Bihar floods, Tauktae)

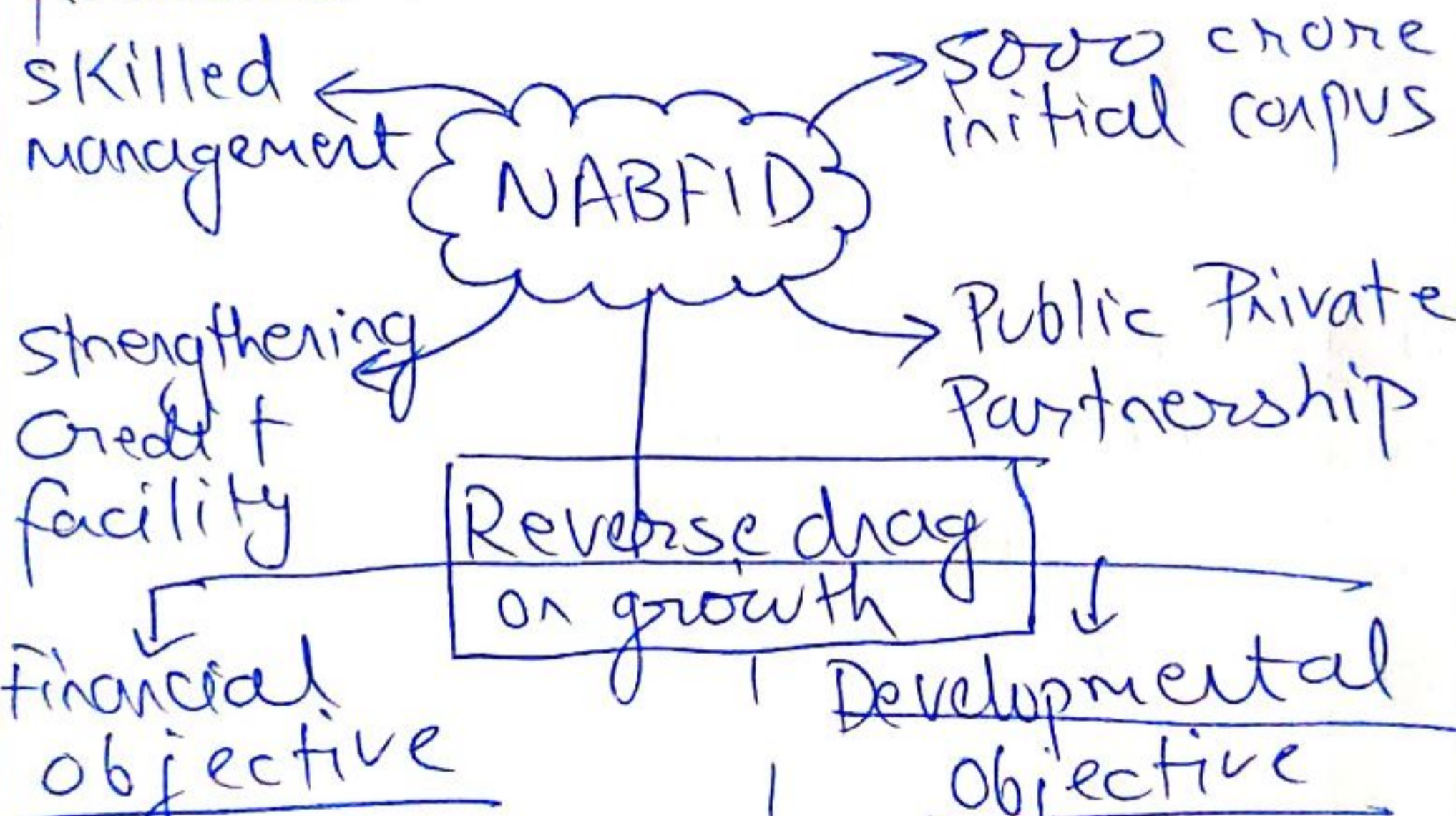


According to NITI Aayog, if waterway is improved, then the logistic cost of India could come down from 14% to more 0%.

2. The move to establish a National Bank for Financing Infrastructure and Development, to reverse the drag on India's growth potential will have its own set of challenges. Discuss. (150 words) 10

भारत की संवृद्धि क्षमता संबंधी अवरोधों को व्युत्क्रमित करने के लिए एक राष्ट्रीय अवसंरचना वित्तपोषण और विकास बैंक की स्थापना के कदम की अपनी स्वाभाविक चुनौतियां होंगी। चर्चा कीजिए।

Recently, the parliament passed the NABFID bill, thereby institutionalising developmental financial institutions.



① Strengthening the bond market

① Consultancy services

② Providing collateral free credit facility programmes

③ Credit linked subsidy scheme.

③ Inviting FII for greenfield

Financial

④ Funding various
Invits, REITS

⑤ Supporting the
 monetisation plan

developmental

investments.

④ Re-engineering the
MSME market

Reversing Drag

① Help with flow of the credit

② Strengthening bond market

③ Consultancy services.

Challenges

① The fund established (5000 cr)
 is very small to bring in
 substantial changes.

② Lack of private sector participation

③ Convoluted laws in the bond
 and share market

④ Risk averse nature of banks.

Hence NABEFD initial corpus
 should be substantially strengthened
 with incentives to private companies
 for maximum output.

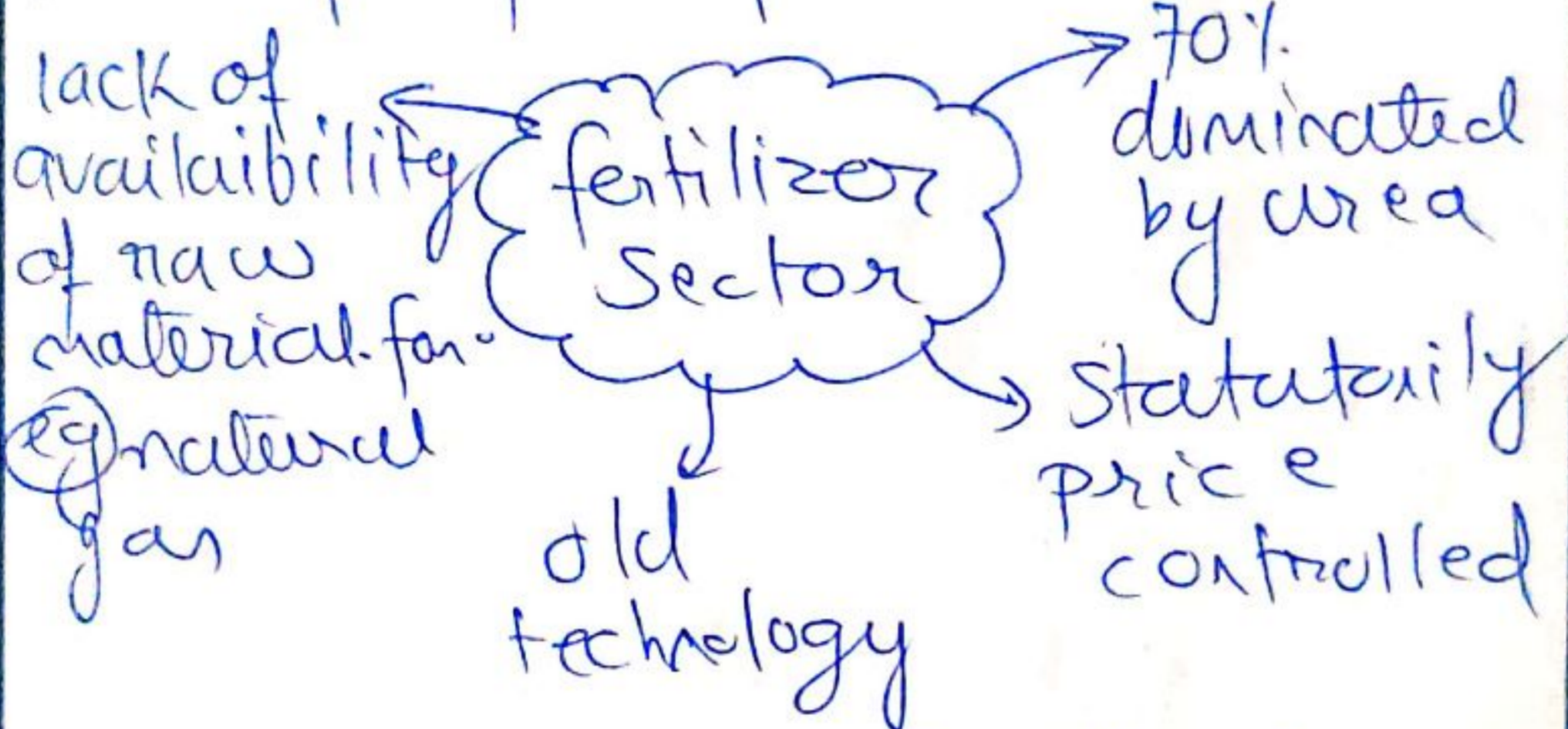
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3. Highlighting the issues related to the current fertilizer subsidy regime in India, discuss the need for reforms in this context. (150 words) 10

भारत में वर्तमान उर्वरक सब्सिडी व्यवस्था में संबंधित मुद्दों को रेखांकित करने हुए, इस संदर्भ में सुधारों की आवश्यकता पर चर्चा कीजिए।

Recently, Japan has taken India to WTO for its trade distorting practices in agriculture in form of input fertilizer subsidy



Issues in current fertilizer subsidy regime

- ① Heavily dominated by urea which is under control of govt.
- ② large scale diversion of fertilizers in black market which is subsidised by govt.

- ③ failure of nutrient based subsidy regime
- ④ Groundwater pollution & Eutrophication due to excessive use of fertilizer
- ⑤ Failure to achieve land degradation neutrality due to faulty use of fertilizer.

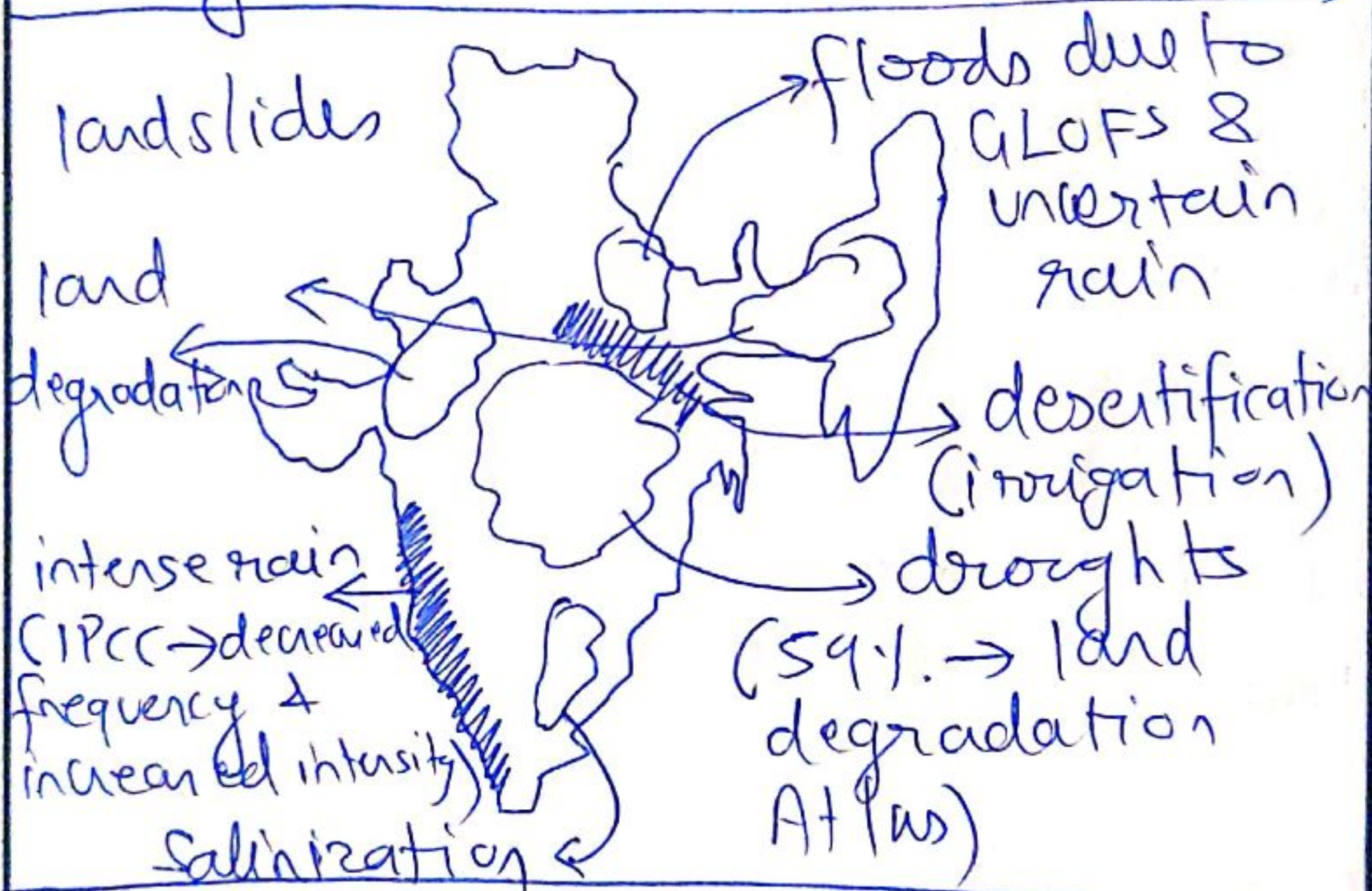
Need for Reforms

- ① Adequate utilisation of fertilizer using soil health card
 - ② diversifying supply chain and production technique (eg Haber process should be modified)
 - ③ Biometric authorisation through POS for reducing leakages as well as using neem coat urea
 - ④ Promotion of SMART Agriculture
- According to CMIE, fertilizer regime should be nationalised for reaching SDG-14

4. Identifying the need for a climate resilient agriculture in India, discuss how it can be achieved. (150 words) 10

भारत में जलवायु प्रत्यास्थ कृषि की आवश्यकता की पहचान करते हुए, चर्चा कीजिए कि इसे कैसे प्राप्त किया जा सकता है।

According to IPCC 6th Assessment report, the Indian subcontinent region is one of the most vulnerable spaces due to climate change



~~Need~~ Climate resilient agriculture refers to adaption procedure undertaken to bridge the mismatch between traditional climate & the onset of climate change.

Need

- ① Rising sea levels resulting in salinisation of subsurface soil
- ② Soil erosion due to increased floods & rain
- ③ land degradation due to increased number of heat waves
- ④ Changing monsoon pattern due to change in global heat distribution.

Measures

- ① Adapting best practices like Koraput wetland farming
- ② Stalling climate change by following panchamrit principles undertaken in glasgow
- ③ Modern methods of farming like
 ① vertical farming ② micro-irrigation
- ④ Utilisation of HYV seeds which are climate resilient → investing more in R & D

Climate change is reality and hence agriculture

5. Mega Food Parks (MFPs) were considered to be a gamechanger for the food processing sector in India, but their progress remains stunted. Discuss.

(150 words) 10

मेगा फूड पार्क (MFPs) को भारत में खाद्य प्रसंस्करण क्षेत्र के लिए एक महत्वपूर्ण चरण (गेमचेंजर) समझा गया था, लेकिन उनकी प्रगति अभी भी अवरुद्ध है। चर्चा कीजिए।

According to PM-Kisan Sampada Yojana, food processing sector would be promoted in order to get more remunerative prices by value addition.

Mega food parks → Food Processing

① Economics of Scale
② larger investment in community based technical services which will help large number of industry
For (eg) grain cutter → sugarcane
→ wheat
→ rice.

③ better connectivity with markets resulting in reduced logistical cost

④ Improved both forward as well as backward linkages thereby

Optimising the performance.

Challenges

- ① lack of skilled Professional due to unavailability of courses, and universities.
- ② behaviour of Indians who prefer fresh over packaged food
- ③ Inverted duty structure.
- ④ Convoluted labour laws resulting in ~~st~~ strikes and lower productivity
- ⑤ lack of investment from private sector.

Way forward

increased flow of credit

→ using National Skill Mission, provide necessary skills

→ investment in Research & development

→ PLI scheme

Niti @75 proposed that robust food processing sector would reduce rural indebtedness & promote agriculture

6. Give an account of the challenges associated with rapidly increasing biomedical waste in India. Also, state the key features of the Bio-medical Waste Management (Amendment) Rules, 2018. **(150 words) 10**

भारत में तीव्रता से बढ़ रहे जैव-चिकित्सा अपशिष्ट में जुड़ी चुनौतियों का विवरण दीजिए। साथ ही, जैव-चिकित्सा अपशिष्ट प्रबंधन (संशोधन) नियम, 2018 की प्रमुख विशेषताओं का भी उल्लेख कीजिए।

Due to COVID-19, the medical waste generated increased to 2 lakh tonnes per day.

Biomedical waste refers to the waste generated during treatment, diagnosis and protective equipment.

Challenges Associated

① Due to low capacity of handling, large amount of medical waste ends up in the street



② Highly harmful for the flora and fauna. If it interacts with

animals it may lead to new zoonotic diseases.

③ may promote and prolong pandemics

Biomedical waste Rules

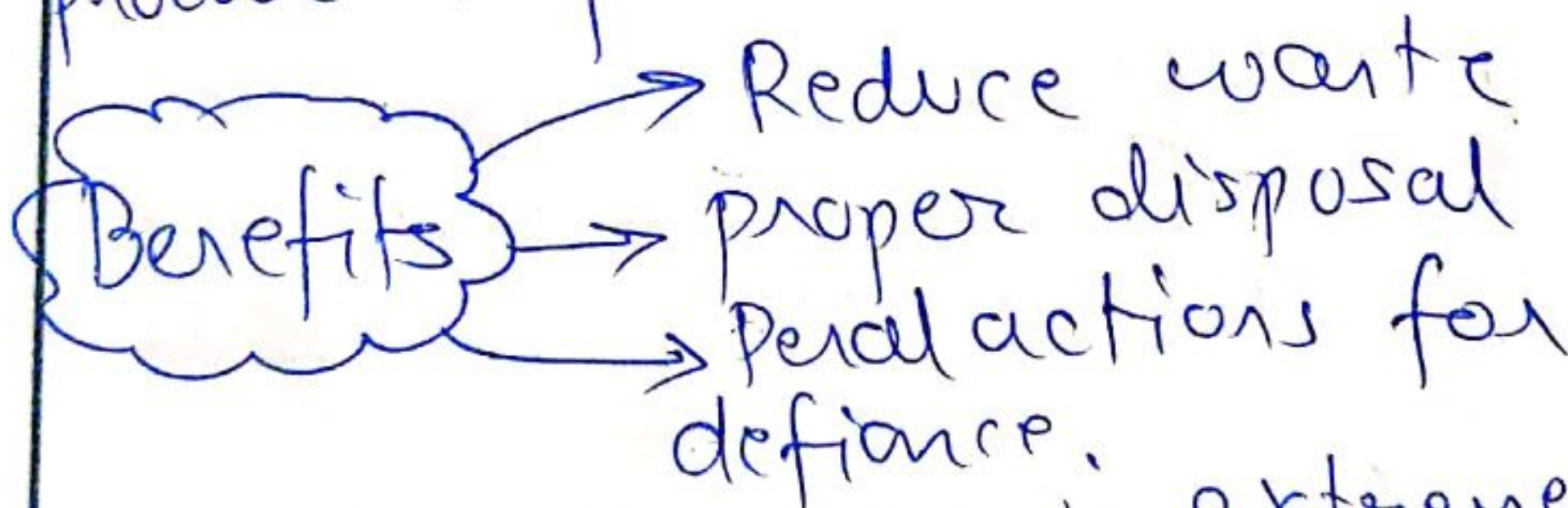
① banning of chlorinated bags

② Four fold clarification of Biomedical waste for better

Segregation & non cross contamination

③ treatment of Biomedical waste at source in accordance of WHO mandated rules.

④ Responsibility of treatment to producer of waste.



Biomedical waste is extremely harmful & therefore must be properly disposed Keeping in mind "One Health"

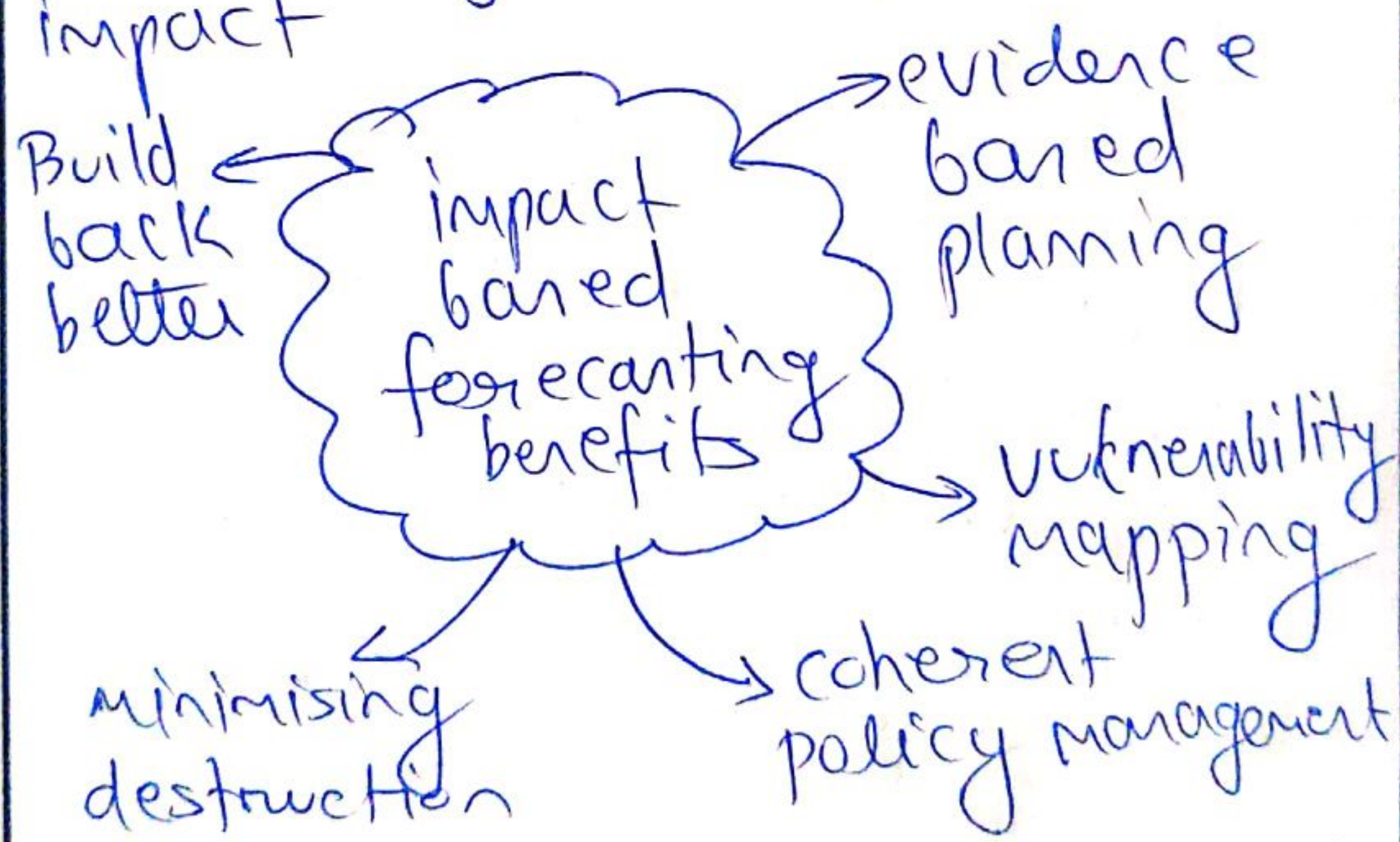
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7. What do you understand by impact based forecasting in disaster management? How can such forecasting strengthen the disaster management preparedness? (150 words) 10

आपदा प्रबंधन में प्रभाव आधारित पूर्वानुमान से आप क्या समझते हैं? ऐसा पूर्वानुमान आपदा प्रबंधन की तैयारियों को कैसे मजबूत कर सकता है?

NDMA defines impact based forecasting as not only forecasting the onslaught of disaster but also the destruction that it would cause - environmentally, economically, on life on its impact



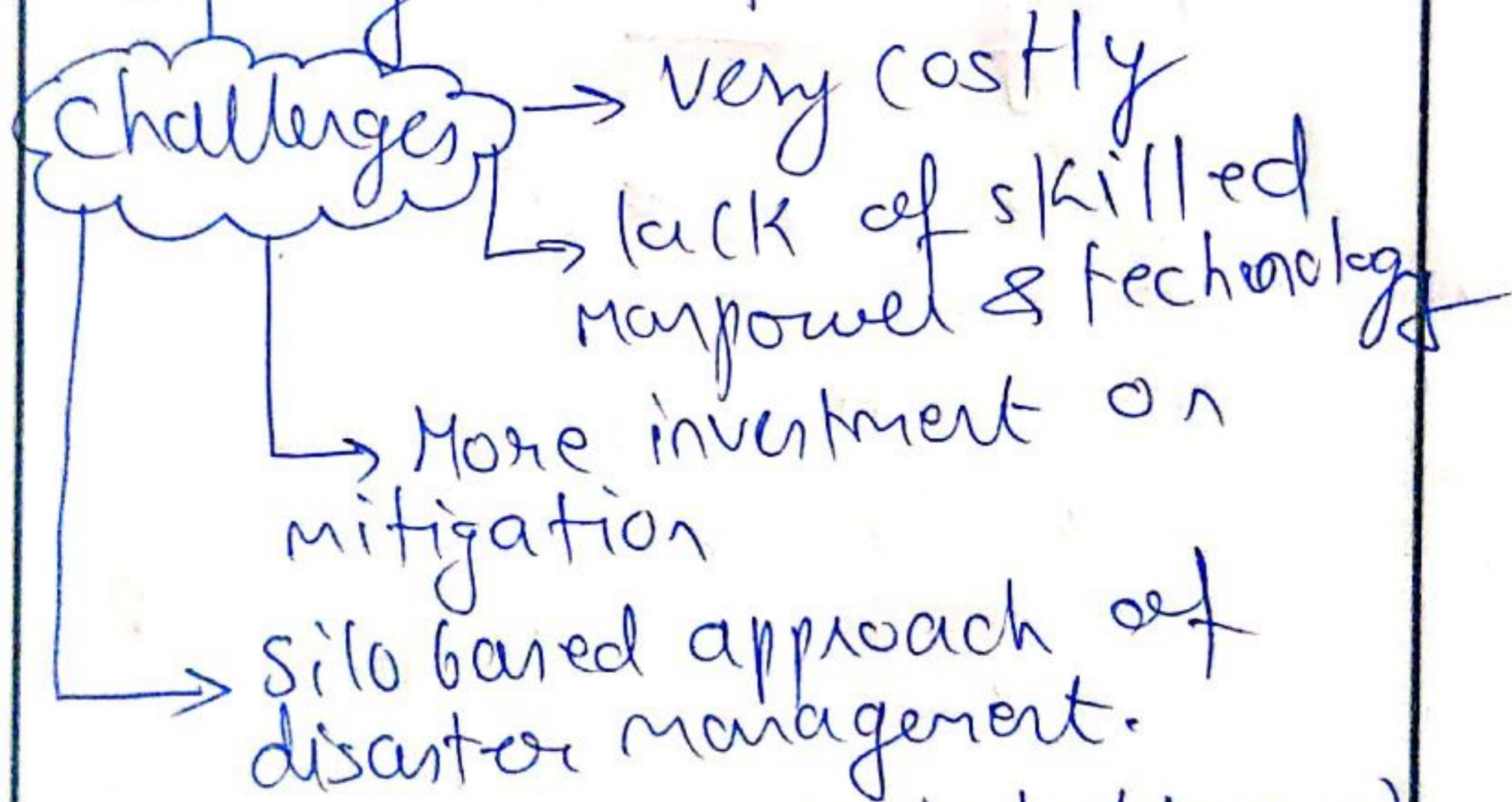
Strengthen disaster Management Preparedness

① Resources can be optimally allocated in more vulnerable areas.

② Minimisation of destruction as the path of it can be cleared prior to impact.

③ Evidence based policy making holistically covering the areas

④ Capacity development

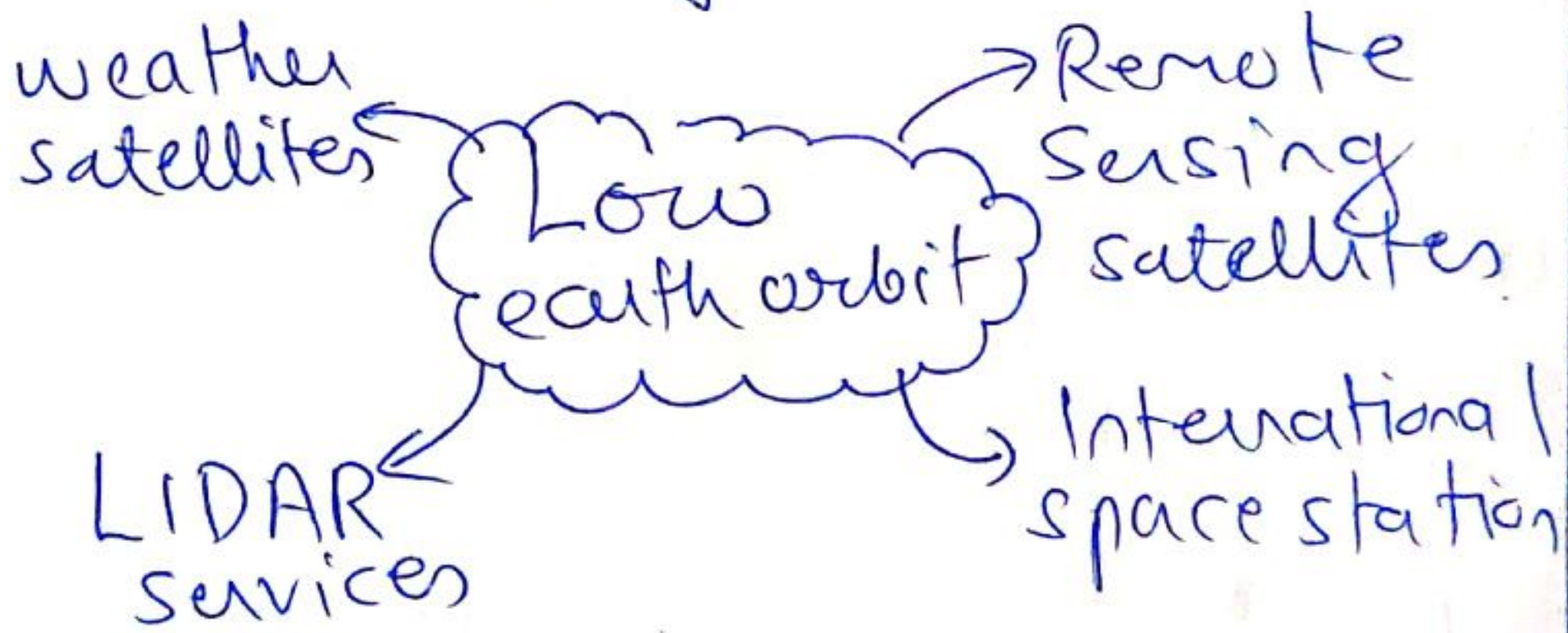


Disaster management in India must transform from reactive to a proactive approach following Sendai framework. Impact based forecasting is a step in right direction

8. Low Earth Orbit is becoming increasingly crowded as countries race to launch satellites into space. Highlighting the associated issues, discuss international efforts taken in this regard. (150 words) 10

देशों द्वारा अंतरिक्ष में उपग्रहों को प्रक्षेपित करने की बढ़ती होड़ में निम्न भू-कक्षा में इनका संकेन्द्रण बढ़ता ही जा रहा है। इसमें संबंधित मुद्दों को रेखांकित करते हुए, इस संबंध में किए गए अंतर्राष्ट्रीय प्रयासों पर चर्चा कीजिए।

Low earth orbit refers to the distance of around 2000km from the surface of earth where countries place their satellites in an orbital path having orbital velocity.



Issues

- ① Lighting up of the night sky resulting in reduced capability of astronomy
- ② Increased space junk increases the possibility of Kessler's

Syndrome.

- ② Makes placement of new satellites harder.
- ④ Since it is first come first serve, it benefits the developed countries.

International Efforts

- ① NETRA mission of India to detect satellites which are harmful for Indian satellites.
- ② Japan → Space cleaner a satellite which constructs space junk in a net & forces it to re-enter earth's atmosphere (burn)
- ③ EU satellites have inbuilt booster to de-orbit satellite, after they have completed their lifecycle
- ④ ~~Earth is a~~ Space is a common heritage of mankind & hence must be sustainably used for a productive future of all.

9. Enumerating the existing measures to counter bio-terrorism in India, highlight the need for a bio-terrorism law. (150 words) 10

भारत में जैव-आतंकवाद का मुकाबला करने के लिए मौजूदा उपायों को सूचीबद्ध करने हुए, एक जैव-आतंकवाद कानून की आवश्यकता को रेखांकित कीजिए।

Bio-terrorism is defined as the deliberate use of pathogenic strain of virus, bacteria, fungus etc to cause widespread indiscriminate loss of human lives with an aim to accomplish religious, social political objective.

Existing Measures

- ① NDMA 2005 act to curb the spread of pandemics.
- ② Epidemic disease Act 1897 used by state govt for enforcing lockdown
- ③ Integrated disease Surveillance programme for stalling the spread of communicable disease
- ④ ICMR, National Center for disease

Control to monitor the genomic sequence

⑤ CD SO for drug trial Permission

Lacunae

- ① lack of dedicated cadre
- ② Laws are old and not equipped to deal with modern threats.
- ③ lack of investment in R&D creating technological deficit
- ④ lack of integrated Command Center for co-ordination.

Need for Bio terrorism law

- ① To create a proactive approach to bio-terrorism tackling.
- ② Create structural & institutional bodies with necessary mandate
- ③ dedicated cadres and allocation of responsibilities

④ Bio-terrorism is a new form of Hybrid warfare that hollows a nation from within & curbs its retaliatory measures

10. Discuss the potential of "Integrated Law Enforcement Centres" and "Smart Walls" on India's border areas to address the prevailing security challenges.
(150 words) 10

मौजूदा सुरक्षा चुनौतियों से निपटने के लिए भारत के सीमावर्ती क्षेत्रों में "एकीकृत कानून प्रवर्तन केंद्रों" और "स्मार्ट वॉल" की क्षमता पर चर्चा कीजिए।

The Indian border is almost 15000 km in length with a large stretch undemarcated & unmanured

resulting in

- ① cross border terrorism
- ② Drug & Human trafficking
- ③ smuggling

Integrated law Enforcement Center

① will aid border force as well as civilian police to effectively curb anti-national activities in border villages.

② Intelligence sharing & more robust response.

③ Help in tackling newer forms

infiltration like drone or UAV based

④ will aid the border force to carry out search, seizure and arrest on suspicious elements.

Smart walls: Utilising the latest ICT technologies like

① Infrared ② drones ③ LIDAR

④ Laser lights to effectively man the border using minimum human presence

→ More responsive & robust
→ also help in detecting new forms of drones, UAV which is not visible to human eye

→ reduce expenditure cost in the long run

→ Lives of soldiers may be saved

with the growing threat of state sponsored terrorism from Pakistan and insurgency in North East modern methods of border management are

11. Farm loan waivers are neither adequate nor recommended for promoting sustained agricultural growth. Analyse. (250 words) 15

सतत कृषि विकास को बढ़ावा देने के लिए कृषि ऋण माफी न तो पर्याप्त है और न ही अनुशंसित। विश्लेषण कीजिए।

In the past 5 years, roughly 3 lakh crore worth of farm loans have been waived off accounting for 2.5% of GDP (SBI Report)

Farm loan waivers & Sustained agriculture growth

① Not adequate not recommended

(a) Instead of creation of tangible infrastructures, money is wasted off in populist measures.

(b) lack of capital creation in farm

- mechanization (only 40%)
- improved irrigation (only 65%)
- e-agriculture & extension service not provided

(c) According to Economic Survey 2019, frequent farmer waivers create behavioural changes

promotes
risky
behaviour

dishonours the
honest farmers.

(d) less capital for investment in modern techniques like

① Vertical farming

② sprinkler & micro irrigation.

(e) No investment in research & development (ES-19, only 1% of agricultural GDP)



Positives

(a) Reduces financial burden from farmers (NSSO → farmer → 74000 average loan)

(b) Ensures food security in country

(c) Constitutional ideals under 41, 42
article & art 21 - Right to life
upheld.

(d) Reduces farmer suicide, (more
than 600000 farmer died
from 1995 - 2019 (NCRB))

In spite of above positives,
the negative of farm loan waivers
outweigh & hence the system
must be rationalised

① More investment in targeted
welfare programme like
PM-Krishi Sinchayee, MGNREGA.

② More procurement under MSP
(Shanta Kumar Committee)

③ Agriculture extension \leftarrow MKisan
KVK expansion

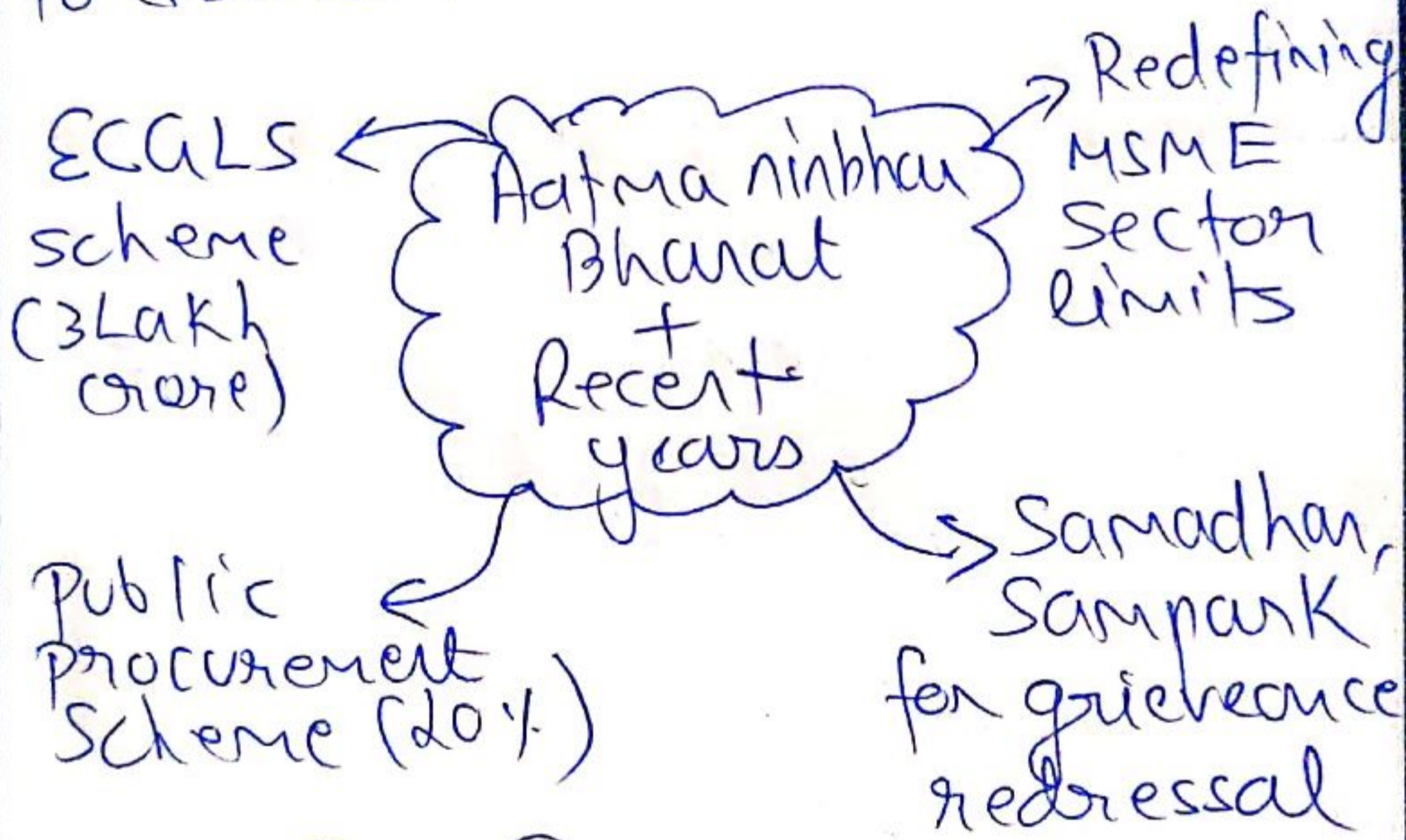
④ ICT technology development
(Bhuvan (ISRO), e-sugro, eNam portal)

Hence a permanent solution to farmer
problem is there empowerment and

12. A number of initiatives in recent years have focussed on the MSME sector. Why is there a need to focus on this sector? Also, identify the measures taken by the government and further scope of action. (250 words) 15

हान के वर्षों में अनेक पहलों ने MSME क्षेत्रक पर ध्यान केंद्रित किया है। इस क्षेत्रक पर ध्यान केंद्रित करने की आवश्यकता क्यों है? साथ ही, सरकार द्वारा उठाए गए कदमों और आगे की कार्रवाई के दायरे की पहचान कीजिए।

Recently during the COVID-19 pandemic, under Aatma Nirbhar Bharat योजना substantial investment was done in MSME to ensure their resilience



Need for focus

① Responsible for 45% of total industrial output. Hence its health directly corresponds to

Industrial Sector health.

② 40% of export from India, hence important for forex reserves.

③ Source of Employment to around 113 million people in rural villages (cottage industry)

④ woman empowerment through self help groups & employment creation.

⑤ Absorbs the disguised employment from agriculture thereby increasing agriculture productivity.

→ Compulsory public procurement for CPSUs (20%) and all contracts under 200 crore

measures take

→ Sampark scheme following hub & spoke model for

faster repayment

→ psblach@59 minutes for faster access to credit facility

→ Trade receivables Scheme to monetise the invoices.

→ ECALS & ILTRO schemes as well as Priority Sector lending

→ udyammitra portal for availing benefits through single window platform.

Further reforms → Following UK Sinha Committee recommendation
↳ establish unique aadhar linked id so that duplication for benefits cannot take place

→ sunset clause for avoiding dwarfism (ES-2019)

→ investment in R & D
↳ skill development (only 47% worker skilled)

Hence a multi-sector approach required for transforming MSME into growth engine of economy

13. Skilling the Indian population faces a 3E challenge - Education, Employment and Employability. Discuss. Also suggest interventions required to effectively manage this challenge. (250 words) 15

भारतीय जनसंख्या को कौशल युक्त बनाने में 3E चुनौतियों, यथा- शिक्षा (एजुकेशन), रोजगार (एम्प्लॉयमेंट) और नियोजनीयता (एम्प्लॉयबिलिटी) का सामना करना पड़ता है। चर्चा कीजिए। साथ ही, इन चुनौतियों का प्रभावी ढंग से प्रबंधन करने के लिए आवश्यक हस्तक्षेपों का भी मुझाव दीजिए।

Recently, the Indian Skill Report highlighted that only 47% of the graduates are employable

Education

① less stress on vocational and skill based education.

② overall high illiteracy (only 73% → census 2011)

③ Curriculum in accordance with 20th century rather than 21st century → no coding → excessive emphasis on rote learning

Employment (SSC more workforce/13000)

① PLFS 2018-19 highlighted employment of only 36% with

Interview

Unemployment of 5.8% (2019-20)

② Jobless growth due to missing middle-labour intensive manufacturing sector.

③ High disguised employment in agriculture.

④ Convolutated labour laws which act as regulatory cholestrol (ES-2019)

Employability - India's Skills Report

① large requirement of re-skilling & upskilling (WEF - Future of Job Report)

② Introduction of mechanisation of agriculture & automation of production.

③ Underemployment - due to lack of jobs, highly qualified people doing menial jobs.

Interventions Required

① Promotion of labour intensive sectors like textile and automobile

② Participation in Global value chains for production of network products (Vietnam → Flying dutch model)

③ Skill development through National skill development cooperation (NSDC) and PM-Kaushal Vikas Yojana.

④ Investment increase in R & D in accordance with National Science & Technology Initiative

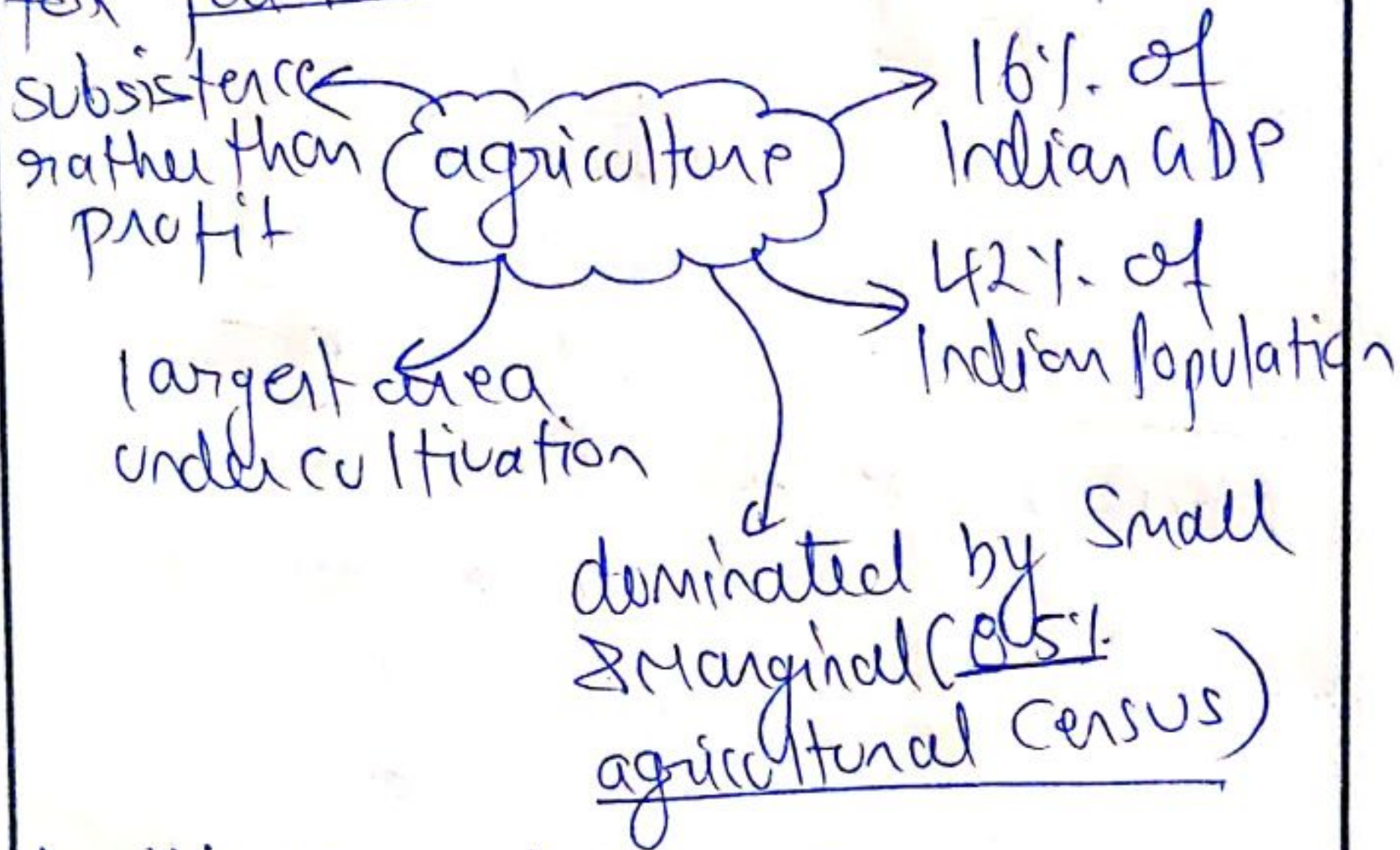
⑤ Effect application of National Education Policy 2020

NITI @ 75 highlighted the importance of skills for reaping the demographic dividend & preventing disaster

14. Despite its importance, agricultural marketing faces various institutional and infrastructural related issues in India. Elaborate. Also, enlist the measures that have been taken in this context. (250 words) 15

अपने महत्व के बावजूद, कृषि विपणन को भारत में विभिन्न संस्थागत और अवसंरचना संबंधी मुद्दों का सामना करना पड़ता है। सविस्तार वर्णन कीजिए। साथ ही, इस संदर्भ में किए गए उपायों को भी सूचीबद्ध कीजिए।

Agriculture marketing refers to the sale of agricultural products for fair & remunerative prices



Institutional issues

- ① Lack of Price discovery as it is statutorily mandatory to sell in APMC, Essential Commodity Act
- ② MSP system highly skewed

for wheat & rice (Shanta Kumar Committee → only 7% farmers benefit)

③ Skewed procurement and lesser number of warehouses except in Punjab & UP (70% procurement)

④ Fertilizer industry favouring intensive agriculture rather than organic which fetch better prices!

Infrastructural Measures

① lack of private sector investment (only 14%) in warehouses and cold storages

② High logistic cost (14% of GDP) making perishable items difficult to transport.

③ High food wastage (40%)

④ due to lack of ICT, corruption

in warehousing receipts.

⑤ Irrigation limited to only 65% leading to vulnerability exposure to variable monsoons.

Measures taken

① National Institute of Climate Resilient Agriculture (NICRA) to train farmers for climate change.

② e-NAM under SFAC for better price discovery

③ formation of 10,000 FPO's for benefiting economies of scale

④ PM-Kisan Sampada Yojana for food processing & value addition

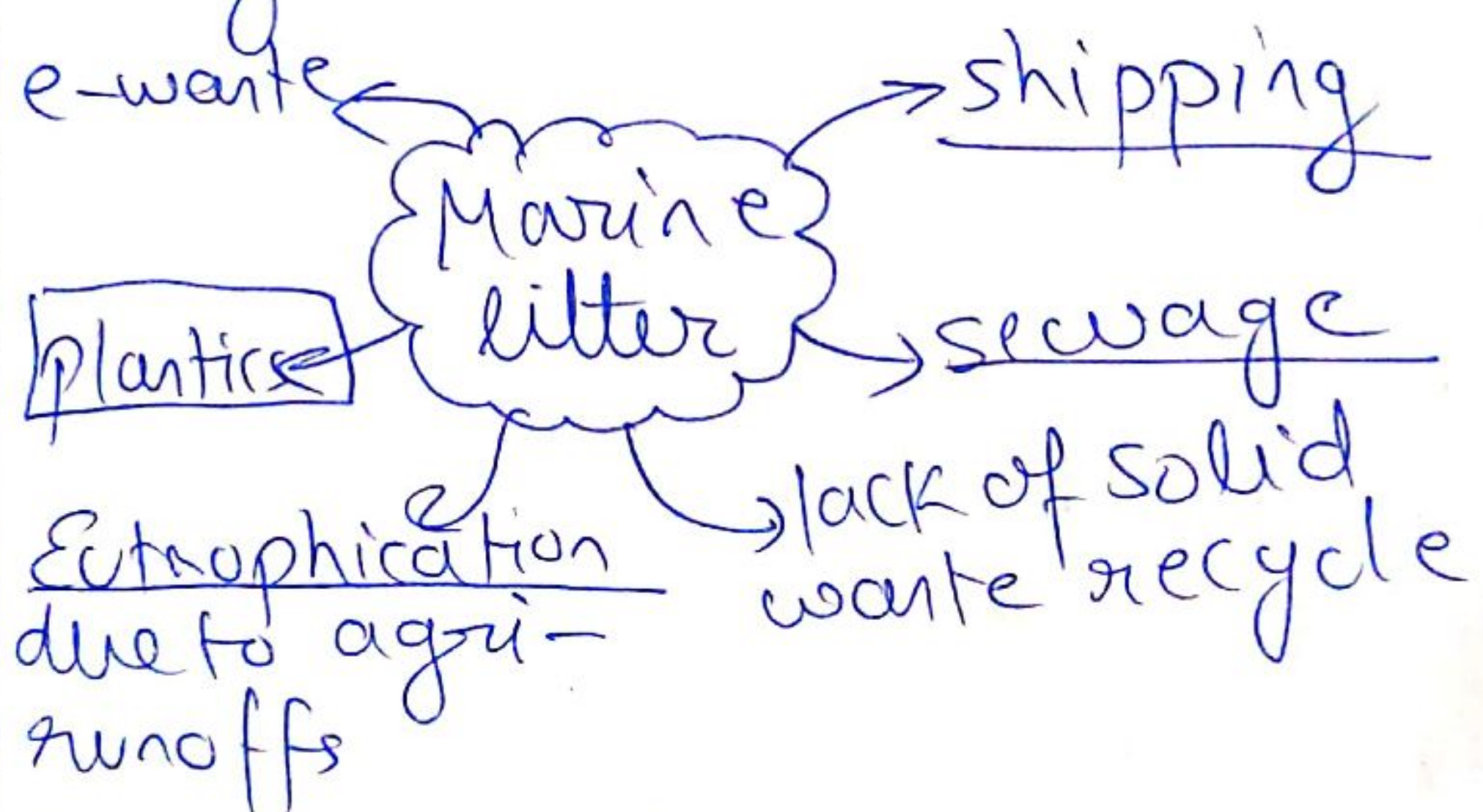
⑤ Organic farming as well PM-Krishi Sishu Yojana

ES-2018 suggest for inclusive growth agriculture market reforms is a must.

15. Marine litter is not just an environmental issue but poses a socio-economic challenge as well. Discuss. Also, enumerate the initiatives taken by the global community to reduce marine litter. (250 words) 15

समुद्री कचरा न सिर्फ एक पर्यावरणीय मुद्दा है, अपितु यह एक सामाजिक-आर्थिक चुनौती भी खड़ी करता है। चर्चा कीजिए। साथ ही, समुद्री कचरे को कम करने के लिए वैश्विक समुदाय द्वारा की गई पहलों को भी सूचीबद्ध कीजिए।

Recently, Global litter programme highlighted that 8 million tonnes of litter end up in the ocean from the terrestrial ecosystem mainly due to human activity



Environmental issues

(i) Creation of Hypoxic areas called as dead zones due to increased BOD

② increase of garbage package resulting in blockage of sunlight killing phytoplanktons & coral.

③ Due to Biomagnification, large scale death of marine animals. For eg Northern Right whales

④ Death of marine animals like whale shark due to choking

⑤ addition of heavy metals like arsenic from e-waste.

Socio-Economic

① destruction of Bioshields like mangrove resulting in increased vulnerability from storms.

② destruction of aquatic habitat resulting in lesser fish catch. EAO SOFIA report highlighted

③ Pollution of coastal areas

resulting in reduced aesthetic beauty → lesser tourism (maldive oil spill), washed up plastic waste.

④ decrease navigation capabilities along coastal water, as marine litter entangles propellers

Measures taken

① London & MARPOL convention to reduce plastic waste from ships.

② declaration of marine protected areas.

③ unplastic collective & plastic pact to reduce & recycle plastic waste.

④ Global organisation like IUCN & WWF spreading awareness.

⑤ e-waste & Biomedical management rules for circular economy

SDG-15 on life in water must be the central concern while formulating policy

16. Assess India's vulnerability to flash floods and suggest measures for better resilience to flash floods. In this context, also briefly highlight the significance of recently launched Flash Flood Guidance System (FFGS) operated by the Indian Meteorological Department (IMD).

(250 words) 15

आकस्मिक बाढ़ के प्रति भारत की सुभेद्यता का आकलन कीजिए और इसके प्रति बेहतर लचीलेपन के उपायों का सुझाव दीजिए। इस संदर्भ में, हाल ही में आरंभ की गयी तथा भारत मौसम विज्ञान विभाग (IMD) द्वारा मंचालित आकस्मिक बाढ़ मार्गदर्शन प्रणाली (FFGS) के महत्व पर भी प्रकाश डालिए।

According to Vulnerability Atlas by NDMA, 14% of the country is prone to floods out of which 25% is prone to flash floods.



Vulnerability

① City based planning rather than Regional planning. For (eg) Chennai

where natural topography results in accumulation

- ② Population explosion in urban areas ($\geq 1\%$ → (census 2011) resulting in
- slum proliferation
 - Choking of drains
 - overstretched municipal resources
 - unplanned concretisation.

③ unpatterned & uncertain Indian monsoons.

④ Restricted predicting capacity of IMD.

Measures for Resilience

- ① Project National monsoon Mission to enhance capability of IMD
- ② Preparation of Master zonal plan for each city
- ③ Removal of encroachments.
- ④ NDMA guidelines involving

Management Information System for better response.

⑤ Dredging operations of rivers and clearing drains of drains pre monsoon!

Flash Flood Guidance System

① Pre-emptive warning to district authorities regarding occurrence of flash floods.

② Consultative operations customised for each city for better mitigation measures.

③ Better accuracy & precision regarding flood forecast.

④ Vulnerability mapping of each inflicted zone for better & appropriate city planning

Instead of reactive, a proactive approach to flood control is set up under FFUS for better response.

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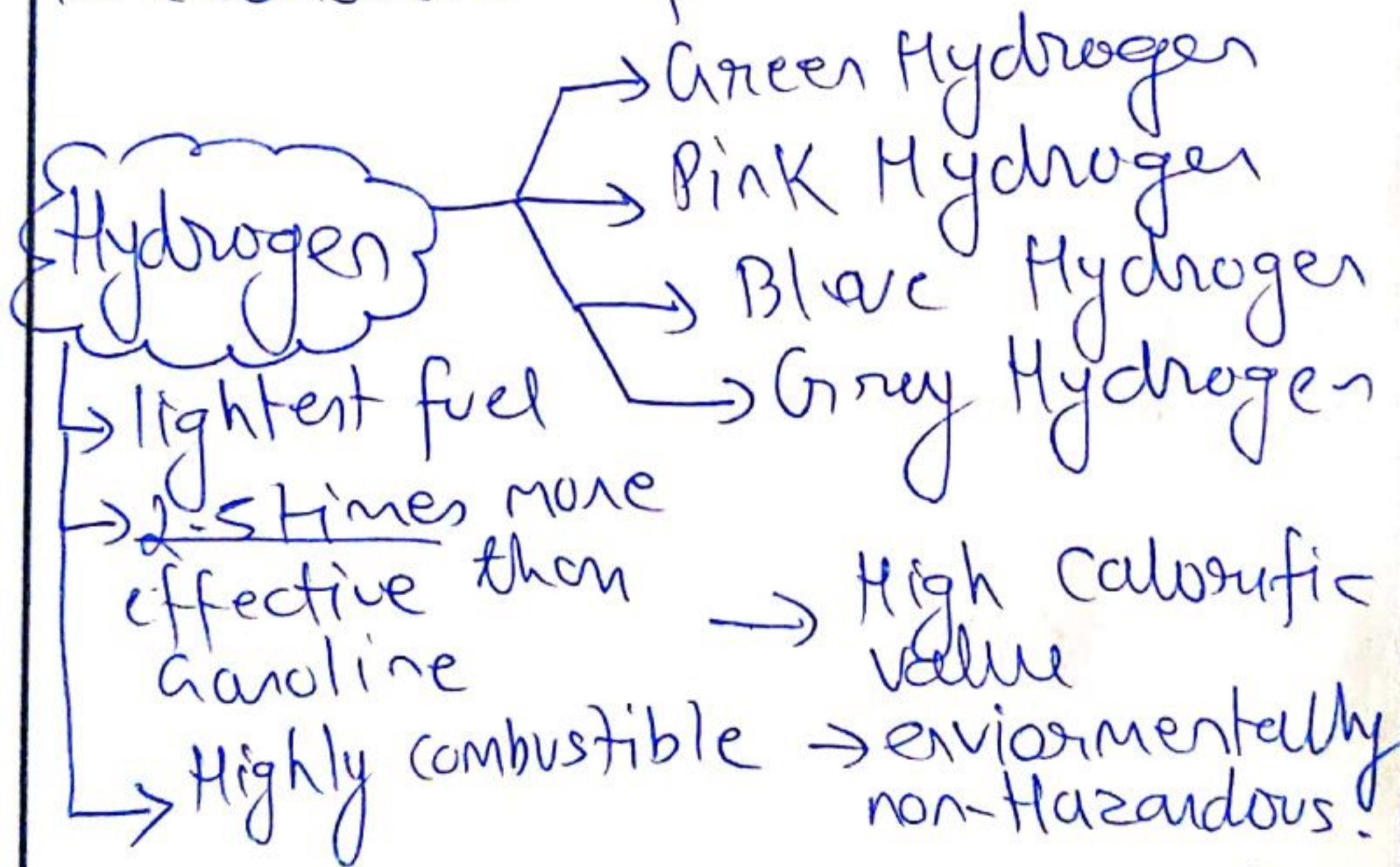
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17. Hydrogen based energy production can play a key role in a clean, secure and affordable energy future. In this context, identify the potential and opportunities for utilising hydrogen based technologies. What are the challenges that need to be addressed to fulfill the potential?

(250 words) 15

हाइड्रोजन आधारित ऊर्जा उत्पादन एक स्वच्छ, सुरक्षित और वहनीय ऊर्जा के भविष्य में महत्वपूर्ण भूमिका निभा सकता है। इस संदर्भ में, हाइड्रोजन आधारित प्रौद्योगिकियों के उपयोग करने की संभावनाओं और अवसरों की पहचान कीजिए। इस क्षमता को साकार करने के लिए किन चुनौतियों का समाधान करने की आवश्यकता है?

Recently, the union Govt. unveiled the National Hydrogen Roadmap highlighting the use of Hydrogen in economic operations.

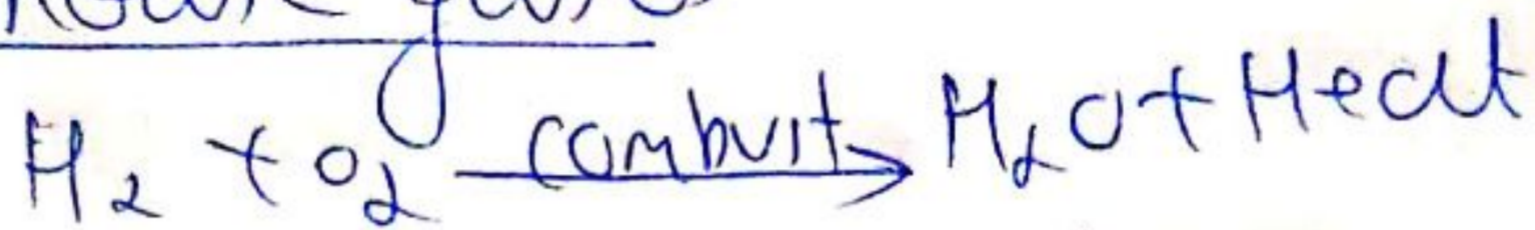


Key Role in Clean Secure and Affordable Energy (Potential)

① Easily abundant and renewable

since it can be produced from water

② Its combustion does not create any harmful substances or green house gases



③ With proper technology like Fuel cell, nuclear fusion (using Tokamak technology) unlimited secure power can be accessed.

④ Easily transportable and ancillary use in fertilizer industry

Opportunities
→ costly Lithium ion batteries and invention of Hydrogen fuel cell.

→ widespread investment for cleaner alternative fuels as ascertained in Glasgow Conference

→ India trying to reduce impact of oil, thereby alternatively investing in other technology

Challenges

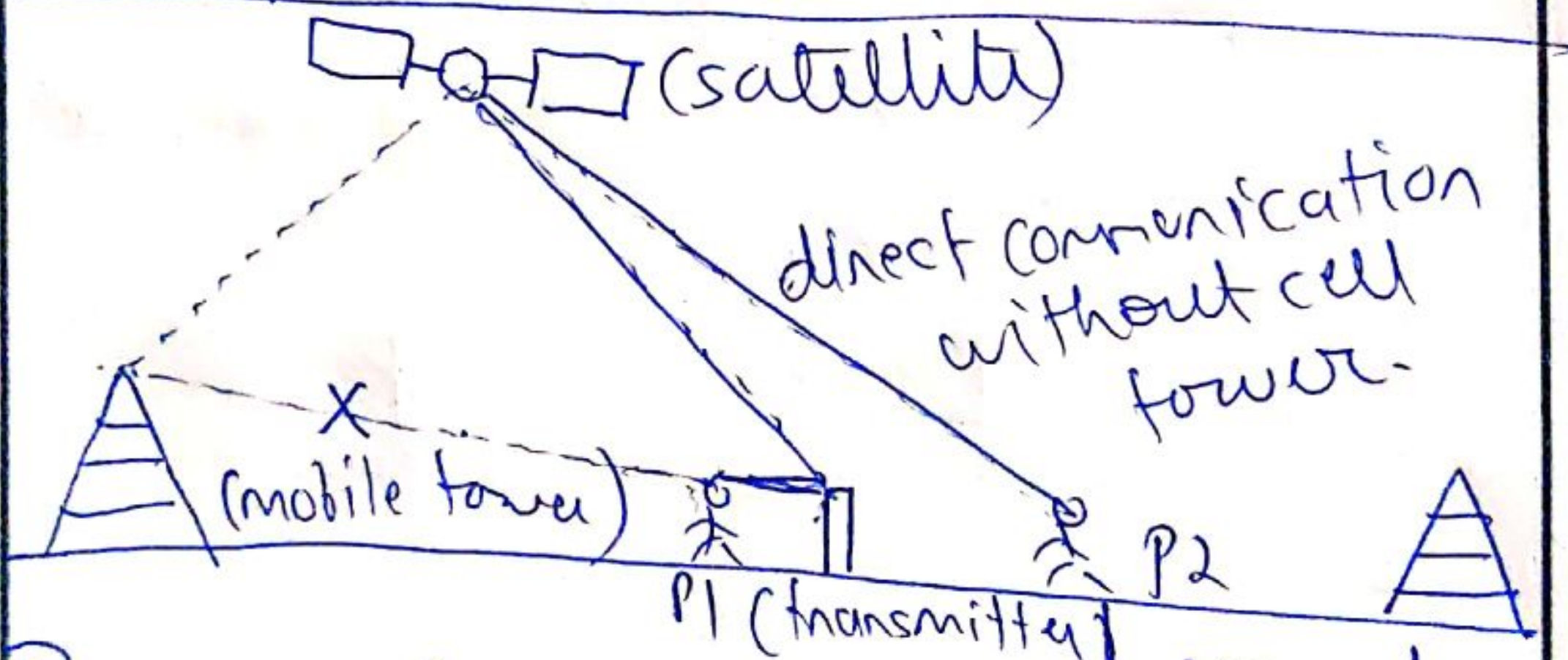
- ① Unavailability of internal combustion engines that solely run on Hydrogen.
- ② H-CNC was not successful
- ③ High prices of Hydrogen production as it is mainly derived from electrolysis whose current is procured from fossil fuels.
- ④ Fusion technology in developmental stage
- ⑤ Huge lobby of oil industry opposing Hydrogen.
- ⑥ Risk of explosion as H_2 is very combustible.

In light of above, National Hydrogen Roadmap aims to utilise Green Hydrogen for not making it only ecologically but also economically sustainable.

18. Despite the huge promise of satellite-based internet connectivity, it hasn't gained traction on a significant commercial scale, especially in India. Discuss. (250 words) 15

उपग्रह आधारित इंटरनेट कनेक्टिविटी में निहित विशाल संभावना के बावजूद, इमने विशेष रूप से भारत में, वाणिज्यिक पैमाने पर महत्वपूर्ण पकड़ स्थापित नहीं किया है। चर्चा कीजिए।

Recently, TRAI introduced the policy for satellite based internet communication, leveraging on India's space expertise in providing economical and widespread internet connectivity.



Promise of Satellite based internet Connectivity

① Cost of sending satellites have greatly reduced
(6,00,000 \$ → 25000 \$)
(1970s) NASA (2020)

Need

① only 45.7% internet penetration
② Right of way hindering cell tower development

② Large Scale land acquisition of setting up of mobile tower no more required.

③ Remote places can also be reached (For eg) SpaceX → Starlink plans to provide universal internet connectivity)

④ No repair & maintenance cost as in case of mobile towers.

No traction for Commercial Sale

① Space based internet connectivity is still relatively costly (25 \$ per GB in place of 0.2 \$)

② Excessive use of satellites causes problems for astronomy

③ Space junk creation which may trigger Kessler syndrome.

① Lack of private Sector Participation in technological development

② Monsoon weather in India results in blockages of satellite signals.

③ No regulatory framework or incentives by govt.

Way Forward

① Promotion of companies like IN-space to promote private sector in space.

② Follow South Korean model of internet governance.

③ Provide incentives for telecom operators to use satellite based connectivity

Due to paucity of land in India, NITI Ayog suggest that serious consideration should be made for space based internet connectivity

19. India's attempts at strengthening its intelligence infrastructure and capabilities have historically been reactive and incremental, rather than holistic and sustainable. Discuss. Also, provide a concrete framework in transforming the country's intelligence capabilities.

(250 words) 15

अपनी आसूचना अवसंरचना और क्षमताओं को मजबूत करने के भारत के प्रयास समग्र और स्थायी होने के बजाय ऐतिहासिक रूप से प्रतिक्रियाशील और वृद्धिशील रहे हैं। चर्चा कीजिए। साथ ही, देश की आसूचना क्षमताओं के रूपांतरण हेतु एक ठोस ढांचा भी प्रदान कीजिए।

The intelligence infrastructure in India follows the broad contours set up by the British & major changes have been brought about as knee jerk reaction to security incidents.

Reactive & Incremental

① 1968 set up of RAW due to defeat in China war and failure of IB.

② Formation of National Security Council due to recommendations of Kargil Review Committee

③ NIA after 2008 Mumbai attack

④ POTA → 2002 Parliament attack

⑤ NATGRID & CCTNS after

lack of coherent National policy exposed due to multiple attacks on India.

⑥ IT Act & National Cyber Security policy after cyber attacks.

However in certain cases, Indian intelligence infrastructure has been Holistic & Sustainable

① CERT-IN under MEITY

② Intermediary rules for regulation of social media

③ National Critical Information Infrastructure.

④ I4C, Cyber Swatchata Kendra

⑤ Coastal Surveillance Zones.

⑥ India's inherent NADIC GPS system for monitoring military activities

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7 Recently released Automatic facial Recognition System.

Concrete framework

1) National Cyber Security Co-ordinator as espoused by NTRC chief for co-ordinating all cyber intelligence.

2) Coastal Marine Police force for securing coastal beaches.

3) One border one force, to remove overlapping jurisdiction.

4) State Security Commissions, to co-ordinate intra and inter state security threats.

5) Increasing the number of cyber professionals to 5,00,000 (National Cyber Security Policy)

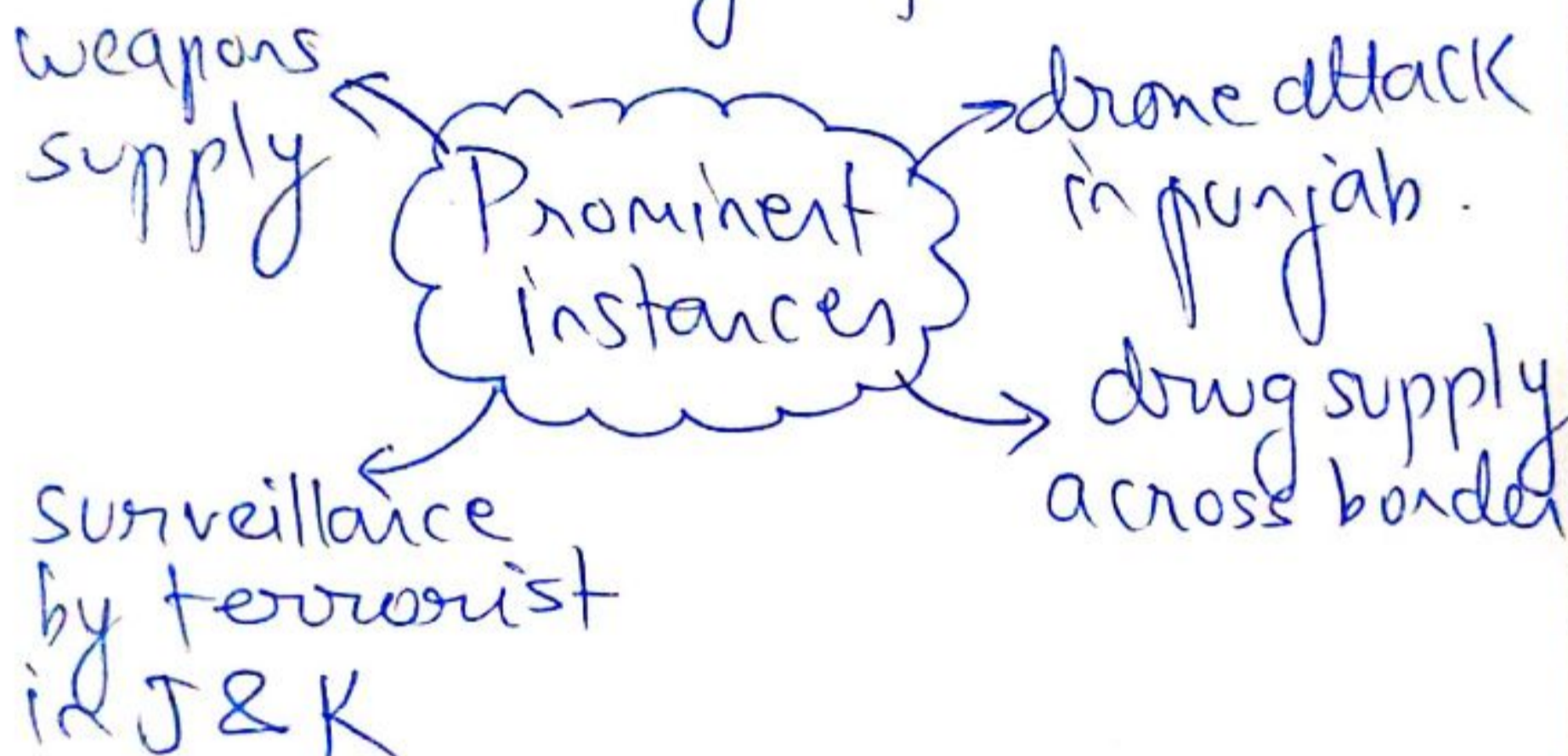
A robust integrated and autonomous intelligence infrastructure is necessary for protecting Indian

sovereignty

20. In light of the prominent instances of drone attacks by both state and non state actors, assess the challenges and capabilities of India in dealing with such security threats. (250 words) 15

राज्य और गैर-राज्य दोनों अभिकर्ताओं द्वारा ड्रोन हमलों के प्रमुख दृष्टान्तों के परिप्रेक्ष्य में, ऐसे सुरक्षा खतरों से निपटने में भारत की चुनौतियों और क्षमताओं का आकलन कीजिए।

Recently, there was a drone attack on an army base in Jammu & Kashmir highlighting the vulnerability of India.



Capability of India

① DRDO has come up with various technologies to neutralise drone attacks like

- ① spoofing
- ② Net Gun
- ③ EMP waves.
- ④ magnetic disorientation

U.P.S.C.

प्रश्न संख्या
(Question No.)

इस भाग में कुछ
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- ② Drone rules recently released by ministry of Civil Aviation to regulate the flying of drones.
- ③ Enhanced Capacities of police & army through specially formulated trainings.
- ④ Enhanced intelligence gathering through
 - ① Satellite mapping
 - ② LIDAR by reconnaissance aeroplanes.
 - ③ Flying UAV's using Radar and Sonar.

Challenges

- ① Very costly equipment thereby increasing burden on tax payers.
- ② High maintenance & operations cost.
- ③ Lack of skilled professionals who are adept at flying drones.
- ④ Lack of IT professionals who are trained in manufacturing

drones.

⑤ Major components are imputed thereby increasing the risk of foreign surveillance and tampering

Way forward

① Training institute for cyber security professionals for manufacturing

② Strengthening & increasing the frequency of satellite mapping

③ Common minimum framework for integrating various intelligence agency over single platform.

Hence a multi-dimensional, multi-pronged, multi-stakeholder approach is required with a robust, adaptable and comprehensive framework for dealing with the emergent threat.