

NEXT IAS

GS MAINS ADVANCED COURSE 2024

(To be filled by candidate)

TEST CODE : GSMAC2403

Test No. : 03

Name of Candidate: Sheela TyagiMobile No.

Roll No. : GSMACT24A1759Start Time 10:00amEnd Time 11:00am

Date of Examination: 25.08.24Medium : English ☒Hindi ☐

Q. No.	Maximum Marks	Marks Obtained	Q. No.	Maximum Marks	Marks Obtained
1	10		1	10	
2	10		2	10	
3	10		3	10	
4	10		4	10	
5	10		5	10	
6	10		6	10	
7	10		7	10	
8	10		8	10	
9	10		9	10	
10	10		10	10	
TOTAL MARKS - 100			TOTAL MARKS - 100		

GRAND TOTAL -/ 250

EVAL CODE: EVAL DTE:

GENERAL INSTRUCTIONS	सामान्य निर्देश
1. Immediately on receipt of the QCA booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet. 2. Candidates must mention all relevant details like Name, Email, Roll No, Mobile, etc. in the space allocated. 3. Candidate is expected to attempt all 10 questions within the given timeline. 4. Answers must be written in the medium authorized at the time of admission. 5. Candidates must write answers for the specific question under the respective question itself. Any answer written outside the space allotted may not be given credit. 6. Please write neatly. Avoid illegible writing. 7. Do not write/mark irrelevant matters in the QCAB.	1. QCA पुस्तिका प्राप्त होने पर कृपया तुरंत जांच लें कि इस QCA पुस्तिका में कोई पृष्ठ या सामग्री आदि गलत छपी हुई या फटी हुई या गायब तो नहीं है। यदि ऐसा है, तो इसे एक नई QCA पुस्तिका से बदल लें। 2. अभ्यर्थियों को सभी प्रासंगिक विवरण जैसे नाम, ईमेल, रोल नंबर, मोबाइल नंबर आदि का आवंटित स्थान पर उल्लेख करना होगा। 3. अभ्यर्थियों से अपेक्षा की जाती है कि वह आवंटित समय-सीमा के भीतर ही सभी 20 प्रश्नों के उत्तर-लेखन का प्रयास करें। 4. प्रत्येक उत्तर, प्रवेश के समय चुनी गयी भाषा के माध्यम में ही लिखे जाने चाहिए। 5. अभ्यर्थियों को विशिष्ट प्रश्न के उत्तर संबंधित प्रश्न के नीचे ही लिखने होंगे। आवंटित स्थान के बाहर लिखे गए किसी भी उत्तर को क्रेडिट नहीं दिया जाएगा। 6. कृपया साफ-सुथरा लिखें। अपठनीय लेखन से बचें। 7. QCAB में अप्रासंगिक तथ्यों को न लिखें / न ही चिह्नित करें।

REMARKS:

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<u>MACRO COMMENTS</u> <i>The Purpose of evaluation@nextias.com is to provide constructive suggestions on 'How to improve Answer Writing and thereby score better marks.</i>
<u>STRENGTHS OF THE CANDIDATE</u>
<u>AREAS OF IMPROVEMENT</u>
<u>IMPROVEMENT SUGGESTIONS</u>

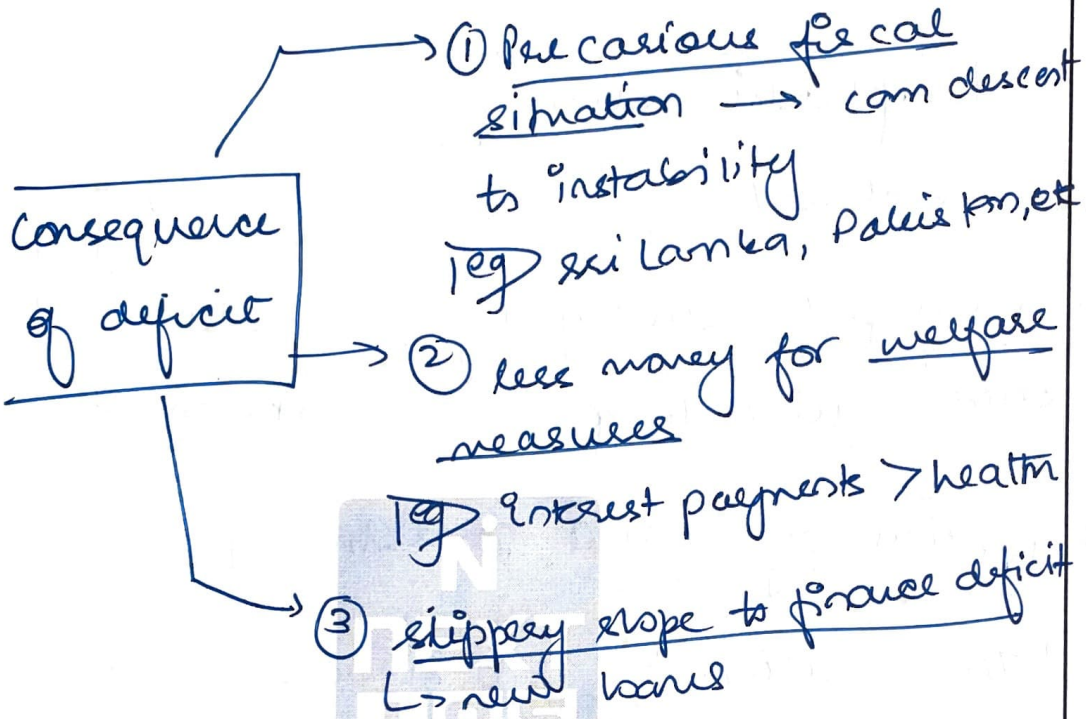
1. भारत में उच्च राजकोषीय घाटे में योगदान देने वाले कारकों पर प्रकाश डालते हुए, ऐसे घाटे के संभावित परिणामों पर चर्चा कीजिए तथा राजकोषीय समेकन (Fiscal consolidation) सुनिश्चित करने के उपाय सुझाइए। (10 अंक, 150 शब्द)
Highlighting the factors contributing to high fiscal deficit in India, discuss the potential consequences of such deficit and suggest measures to ensure fiscal consolidation.
(10 marks, 150 words)

Fiscal deficit in India is at 5.6% of the GDP. The deficit has reduced from 9.2% at FY 21-22 but still is above 4% recommended by FRBM Act.

Factors contributing to high Fiscal Deficit

- ① High subsidy burden
↳ 2.5% of GDP goes in subsidies
- ② High debt burden
↳ 2 billion of India's earnings go in debt repayments
- ③ Low tax revenues
↳ 11.6% of GDP from taxes
↳ low tax buoyancy from 2021-22
- ④ lack of scheme rationalisation

- ⑤ Inadequate management of revenues.
 ↳ leakages in system present



way ahead

- ① Rationalise subsidy → especially fertiliser
 use of ~~fuel~~ fuels
- ② Increasing revenue mobilisation
- ③ taxation increase on corporations &
to inheritance.

Thus, the goal to become FRBM
compliant by 2025 can save us from
 a high fiscal deficit

2. 2047 तक भारत के विकसित राष्ट्र बनने की आकांक्षा महत्वपूर्ण पूँजीगत निवेश पर निर्भर है। इसके आलोक में, इस लक्ष्य को प्राप्त करने में पूँजीगत निवेश की संभावनाओं पर चर्चा कीजिए। इस संदर्भ में भारत के समक्ष क्या चुनौतियाँ हैं?

(10 अंक, 150 शब्द)

India's aspiration to be a developed nation by 2047 hinges on significant capital investment. In light of this, discuss the potential of capital investment in achieving this vision. What are the challenges India faces in this regard?

(10 marks, 150 words)

Saptarishi policy of Budget 23-24 has declared the goal of becoming a developed country by 2047. This would require large capital investment.

Potential of capital investment

- ① The creation of new infrastructure which has a multiplicated effect on the economy -
- ② the increasing revenue expenditure only ensures upkeep → requirement of new infrastructure
- ③ the Indian system lacks large pillars → roads density, Railway efficiency, etc
- ④ Capital spending can create space in private investment

challenges
faced in
this regard

① capital formation rate
at a 17% in economy

② budget priorities usually
to revenue expenditure

17% Defence → 58% →
pensions
17% to new
infrastructure

③ low tax buoyancy →
low resource mobilization

④ falling revenues from
disinvestment

→ target = ₹1,000 cr &
actual = 10,000 cr

way
forward

① Asset monetisation scheme

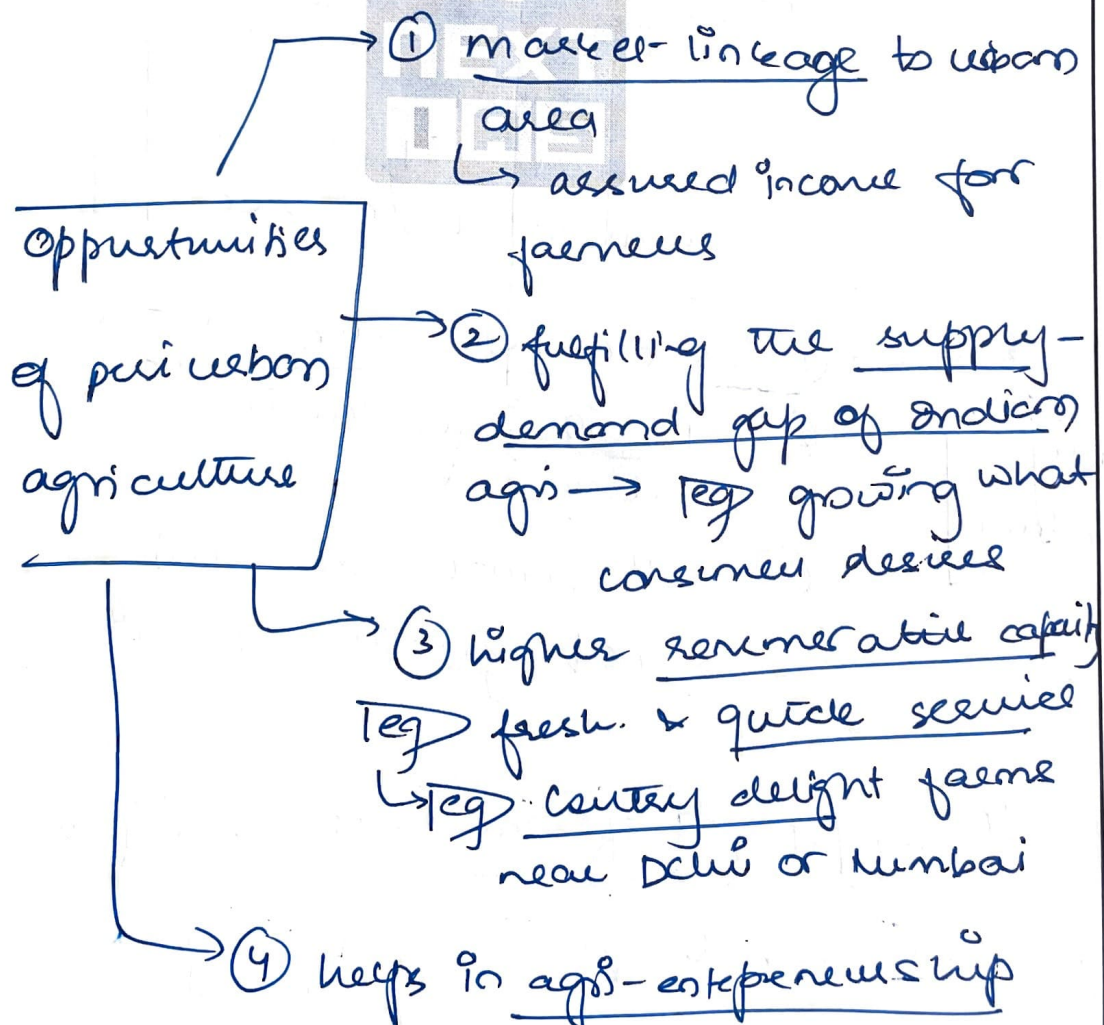
② PPP in infrastructure
creation

③ collaboration in multi-
lateral agencies → 17% ADB

Thus, SDG 9 of innovation & infra-
structure can be pushed only by
capital investments in the economy

3. "नगरीकरण में वृद्धि के साथ, पेरी-अर्बन/परिनगरीय कृषि (Peri-urban agriculture) ताजा कृषि उपज की आवश्यकताओं के लिए एक महत्वपूर्ण योगदानकर्ता के रूप में उभरी है"। इस संदर्भ में, सतत रूप से पेरी-अर्बन कृषि को बढ़ावा देने से सम्बंधित अवसरों और चुनौतियों पर चर्चा कीजिए। (10 अंक, 150 शब्द)
- "With growing urbanization, peri-urban agriculture is emerging as a significant contributor to fresh farm produce needs". In this context, discuss the opportunities and challenges associated with promoting peri-urban agriculture in a sustainable manner. (10 marks, 150 words)

Peri-urban ^{agriculture} ~~infrastructure~~ can
be defined as smaller scale agriculture
that takes place close to urban areas
- either in tier 2 or 3 towns or nearby
rural areas.



Challenges present:

- ① Capital intensive → acquiring land or building space
- ② competition from imports → especially after FTA - eg ECTA with Australia
- ③ lack of credit facility → leaves out urban agriculture.

④ lack of awareness among farmers

⑤ low forward & backward linkage
 ↓ ↓
 farmer markets cold storage

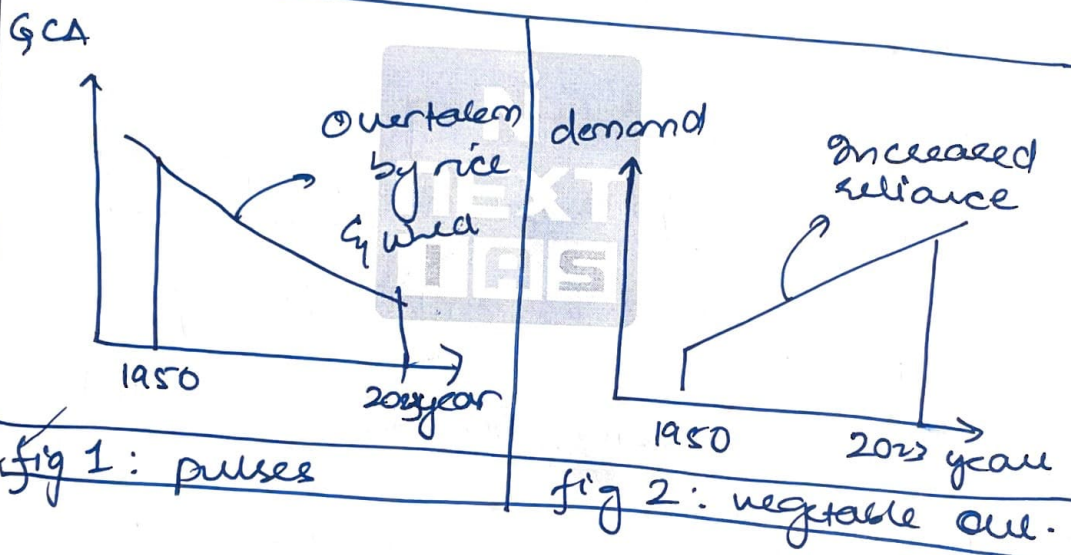
way ahead → ① inclusion in urban credit card
 → ② welcoming agri-tech firms
 eg MAPRO

Thus, peri-urban agriculture can serve as the critical link between urbanisation & agriculture quality.

4. दालों और वनस्पति तेलों में आत्मनिर्भरता प्राप्त करने के लिए भारत के कृषि क्षेत्र के समक्ष कौन सी प्रमुख चुनौतियाँ हैं? इन चुनौतियों के समाधान भी सुझाइए।
(10 अंक, 150 शब्द)
What are the major challenges faced by India's agriculture sector to achieve self-sufficiency in pulses and vegetable oils? Suggest measures to address these challenges.

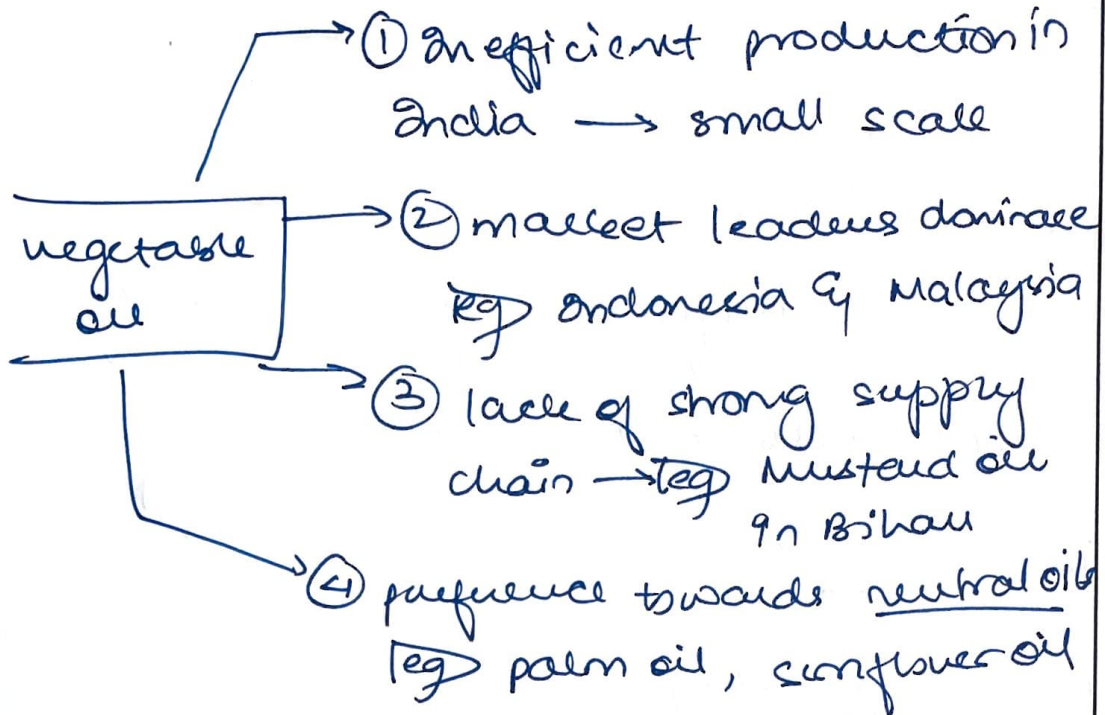
(10 marks, 150 words)

Despite India being one of the largest agri-producers and exporters, it is critically dependent on import of pulses and vegetable oil.



Challenges to self sufficiency:

- pulses →
- ① Lack of cultivation - focus cultivating rice wheat
 - ② MSP bias against pulses
 - ③ low costs of import eg Africa.
 - ④ low remunerative capacity



Measures to address challenge

- ① Increase MSP of pulses → encourage cultivation
- ② Reduce MSP & external subsidy support of water & electricity to rice
→ push for diversification
- ③ National missions on oil palm & pulses → dryland farming.
Amerson & Nicobarr islands

Thus, the increased production of both can decrease imports as well as inflationary pressures.

5.

भारत को एक सतत हरित अर्थव्यवस्था बनाने में जैव-विनिर्माण (Biomanufacturing) और जैव-फाउंड्री (Bio-foundry) की संभावनाओं का मूल्यांकन कीजिए।
 Evaluate the potential of biomanufacturing and bio-foundry in driving India's future towards a sustainable green economy.
 (10 अंक, 150 शब्द)
 (10 marks, 150 words)

Biomanufacturing & Biofoundry can be understood as the use of live enzymes in the production of technological equipment.

Potential of the two :

- ① Already India one of the leaders of Bio-manufacturing ⇒ headstart
- ② strong backward linkage ⇒ strong government institutions as well as skilled workforce.
- ③ Government support → eg DBT's credit scheme.
- ④ Research push → eg National Bio-tech Mission.
- ⑤ Growing industry → expected to reach

\$ 150 billion by 2025 & \$ 300 billion by 2030.

Towards sustainable green economy → ① helps plug the green gap in technological projects

→ ② Adoption of Nature-based infrastructure mechanisms (NBIS)

→ ③ would complement the role of nature.

way forward → ① skill upgradation

→ ② credit & capital availability

→ ③ awareness & information

Thus, biomanufacturing & bioprosody have the potential for India to increase innovation but also be climate compliant.

6. पुनः प्रयोज्य प्रक्षेपण यान (RLV) की कार्यप्रणाली के पीछे क्या सिद्धांत हैं? भारत के अंतरिक्ष वाणिज्य में आर.एल.वी. के उपयोग के महत्व और संभावित लाभों की व्याख्या कीजिए। (10 अंक, 150 शब्द)
What are the principles behind the working of Reusable Launch Vehicle (RLV)? Explain the significance and potential benefits of use of RLVs in India's space commerce. (10 marks, 150 words)

A usual rocket or launch vehicle delivers the satellite or the payload and deconstructs on its ascent.

However, an RLV or a reusable launch vehicle has the ability to revolutionise this field.

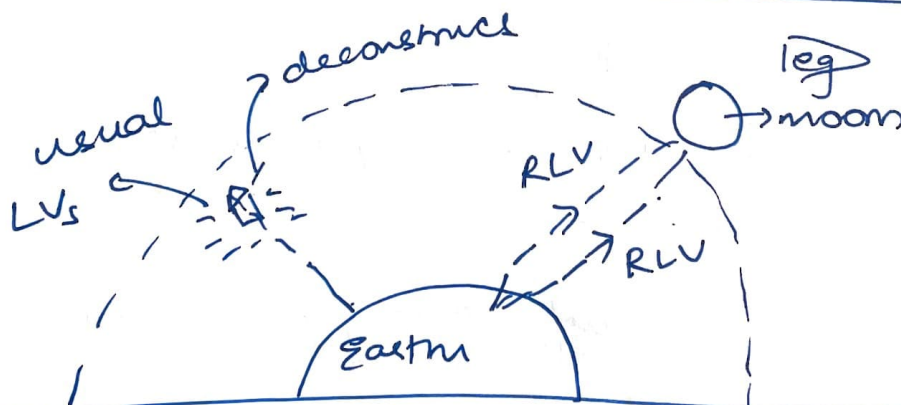
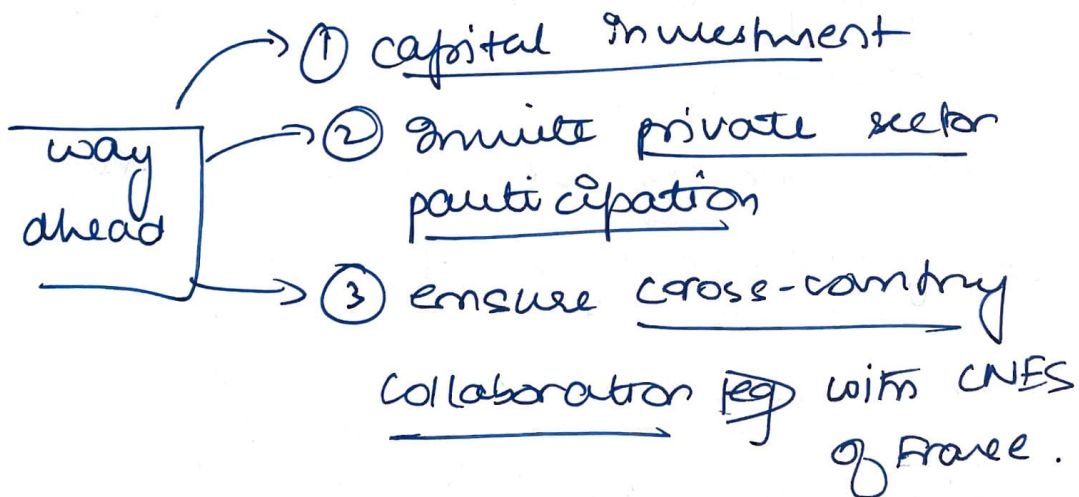


fig: functioning of RLV

- principal
- ① capacity to return
 - ② ability to carry enough fuel
 - ③ avoid destruction at escape velocity

Significance & Benefits

- ① would create a large leap in the field of launch vehicles
- ② would help conserve both resources to build new rockets as well as decrease their overall time.
- ③ would reduce the threat of space debris → Kessler syndrome
- ④ Essential for human space flight missions → eg Gaganyaan



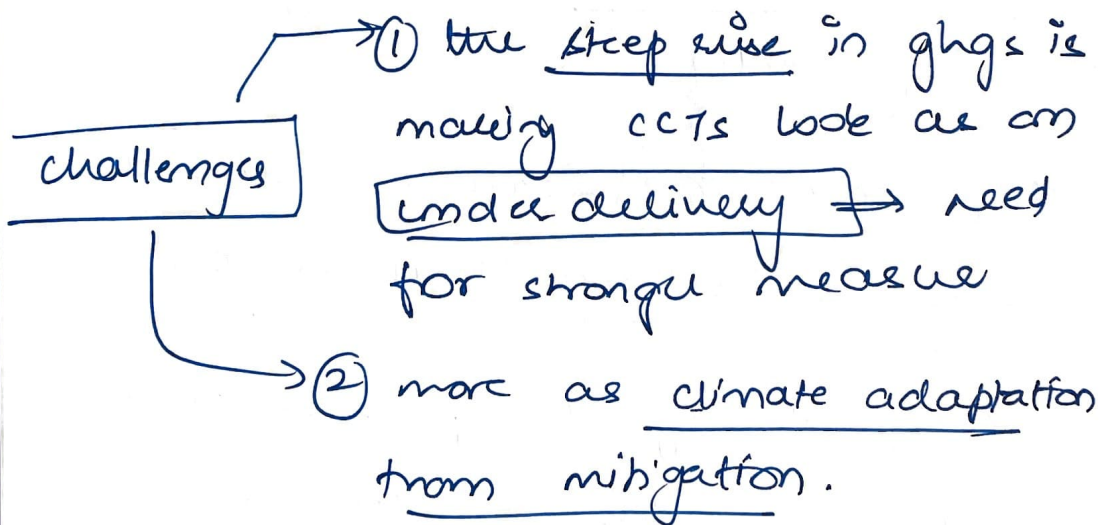
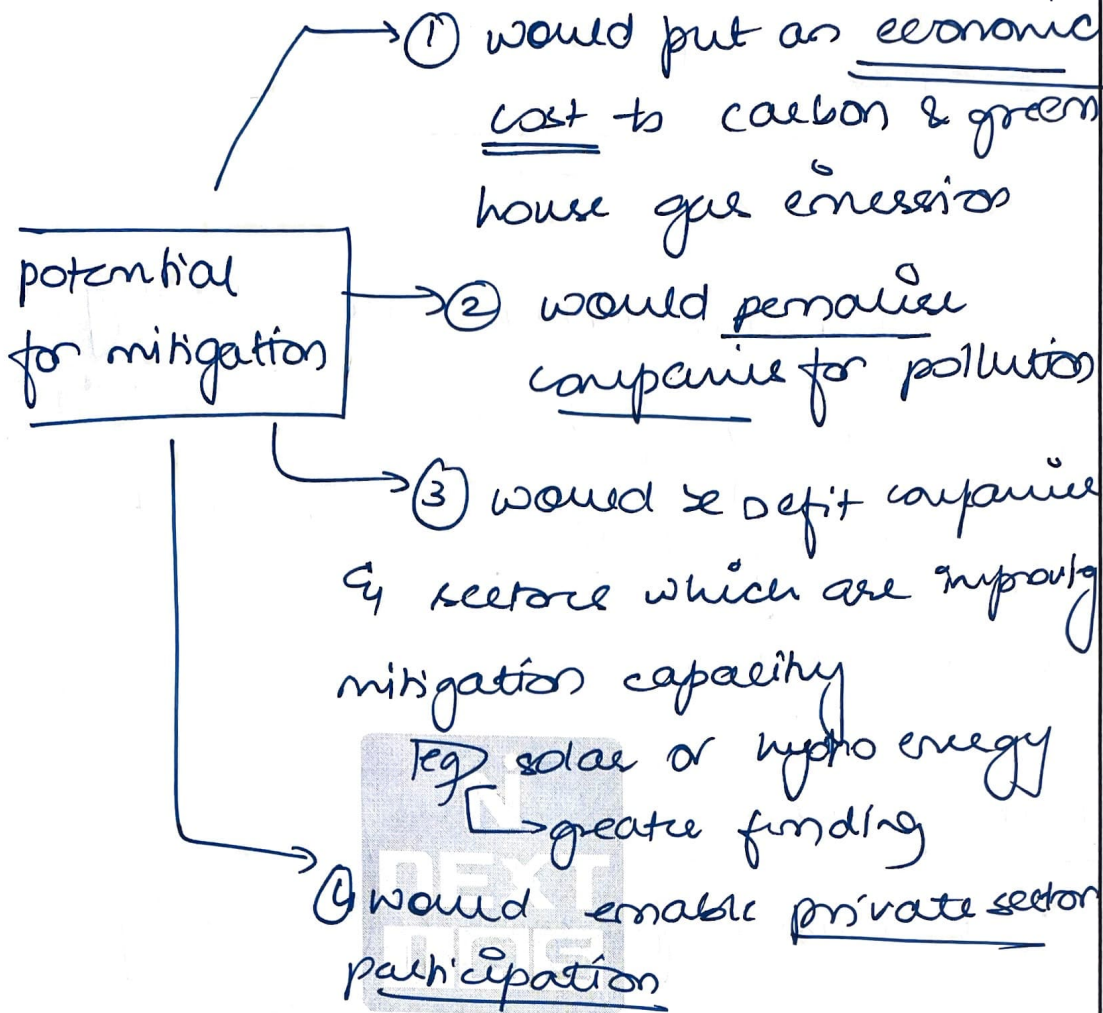
Thus, RLVs have the potential to revolutionise India's space sector.

7. कार्बन क्रेडिट ट्रेडिंग स्कीम (CCTS) 2023 की प्रमुख विशेषताओं का परिक्षण कीजिए। भारत में हरित गृह गैस (Greenhouse gas) उत्सर्जन को कम करने की इसकी संभावनाओं का विश्लेषण कीजिए। (10 अंक, 150 शब्द)
Examine the key features of the Carbon Credit Trading Scheme (CCTS) 2023. Analyze its potential for mitigating greenhouse gas emissions in India. (10 marks, 150 words)

The Carbon Credit Trading scheme 2023 is a market mechanism launched by Ministry of Environment & Forest to ensure the 100-28 promise of carbon-credit market.

Key features of CCTS 2023

- ① creation of a market mechanism
↳ fulfilling the demand of post-kyoto mechanisms
- ② would work on the aspect of defining cost of 1 tone of emitted carbon
- ③ work as a stock exchange where emissions units could be traded
- ④ transparency & accountability while trading



Thus, CCTs were to integrate SDG 8 on Economic growth & SDG 13 on Climate Action.

8. पिछले दशक में हीट वेव की बढ़ती गहनता, आवृत्ति और अवधि के मद्देनजर, क्या "हीट वेव" को अब आपदा प्रबंधन अधिनियम, 2005 के तहत एक अधिसूचित आपदा के रूप में शामिल किया जाना चाहिए? (10 अंक, 150 शब्द)
In light of the increased intensity, frequency and duration of heat waves in the last decade, do you think the time has come to include "heat waves" as a notified disaster under the Disaster Management Act, 2005?
(10 marks, 150 words)

As per the UNEP, the intensity and frequency of heat waves have increased by 8 times in the last two decades.

Heat waves as disaster

- ① Heat wave frequency increasing as global warming increasing by 1.5°C by 2050
- ② the urbanisation scale increases the intensity of urban heat wave.
- ③ the melting of ice cap → especially the hindu-kush is increasing the intensity → due to less albedo.
- ④ The increased duration of summers → heat wave capacity

Need for heat wave notified as disaster:

- ① without disaster notification, the help from government is a matter of choice
- ② impact very high on economy →
eg 5.6% of working hours lost due to heat waves (IUCN)
- ③ impacts the vulnerable sector →
↳ poorest of poor → farmers, daily wage workers, etc
- ④ would lead to the creation of a National Disaster Management guidelines
- ⑤ create Action plan at local & national level.
- ⑥ would also encourage changes in further construction.

Thus, heat wave notification - especially in impeding global warming is the need of the hour.

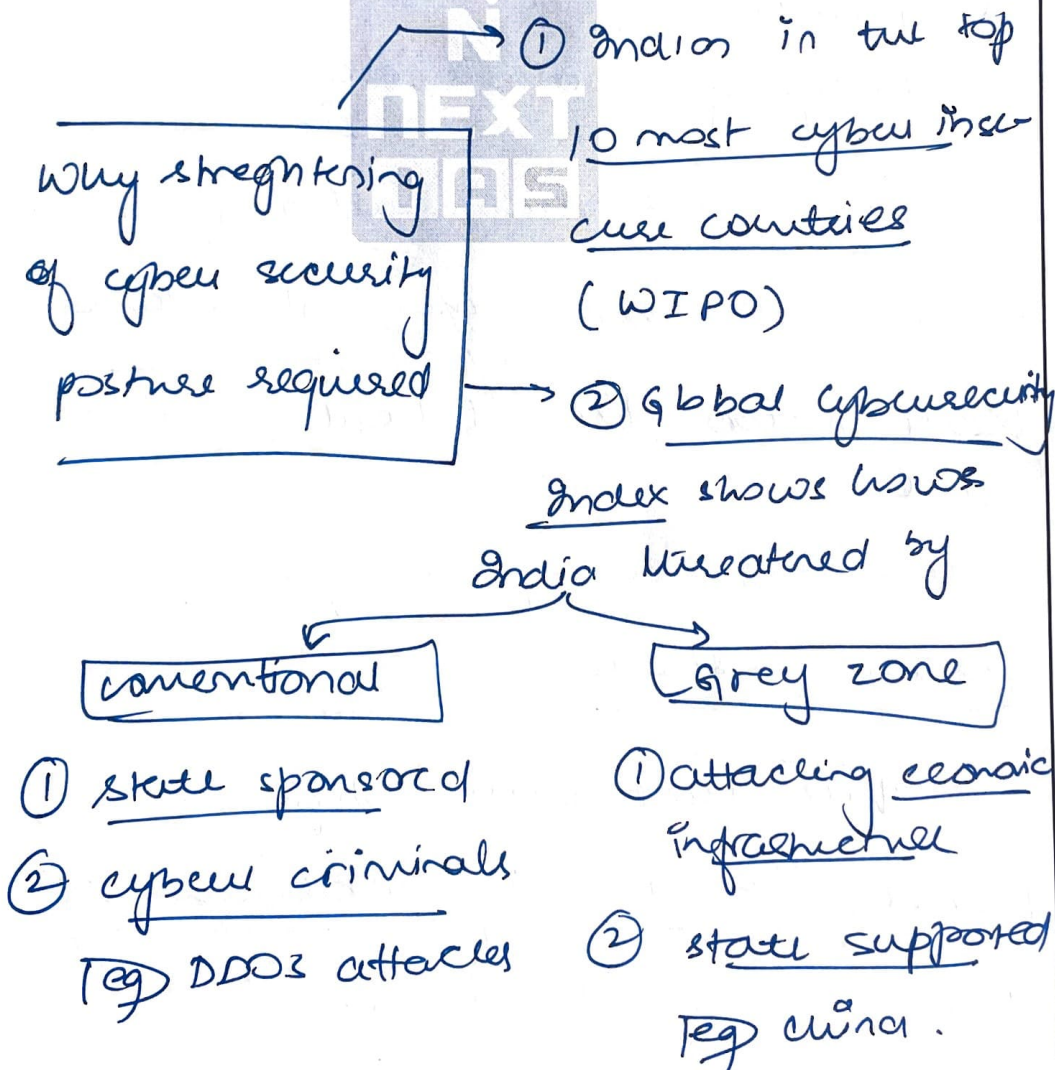
9. भारतीय सशस्त्र बलों द्वारा हाल ही में तैयार किए गए 'साइबर-अंतरिक्ष अभियान (Cyberspace operations) के लिए संयुक्त सिद्धांत' से पारंपरिक ऑपरेशनों के साथ-साथ ग्रे जोन युद्ध दोनों के लिए साइबर-सुरक्षा स्थिति मजबूत होगी। परीक्षण कीजिए।

(10 अंक, 150 शब्द)

Recently formulated 'joint doctrine for cyberspace operations' by Indian armed forces will lead to strengthening of the cyber-security posture for both conventional operations as well as gray zone warfare. Examine.

(10 marks, 150 words)

Recently, the Joint doctrine for cyberspace created by the armed forces seek to tackle cyber-threats and their multi-dimensional nature.



How cyber - security posture strengthened

- ① the identification of multidimensional nature of threat from cyber space
- ② lack of capacity building addressed
eg despite National cyber policy of 2013 detailing need for 1 lakh workforce $\Rightarrow$ only 23k at present
- ③ would lead to integration of cyber as 4th domain of warfare.
- ④ meet China's rising capability in cyber space (US National security strategy - 2023)
- ⑤ help create cross-country collaborations $\rightarrow$ eg Japan & US

Thus as data becomes the new oil & cyber space the new battle ground, there is need for upgradation of our infrastructure & capacity

10. पाकिस्तान और बांग्लादेश से सटे राज्यों में सीमा सुरक्षा बल (BSF) के प्रादेशिक क्षेत्राधिकार के विस्तार की आवश्यकता एवं संभावित मुद्दों पर चर्चा कीजिए।
(10 अंक, 150 शब्द)
Discuss the necessity and potential issues surrounding the extension of the Border Security Force's (BSF) territorial jurisdiction in states adjacent to Pakistan and Bangladesh.
(10 marks, 150 words)

The BSF or the Border security Force is one of the para-military forces responsible for guarding India's borders with Pakistan & Bangladesh.

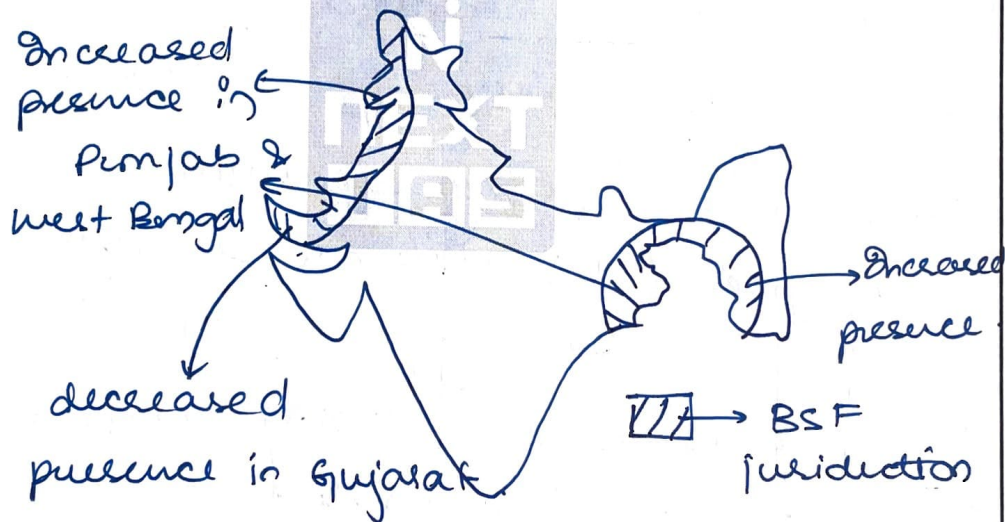


Fig 1 : BSF's jurisdiction

Necessity of extending territorial jurisdiction

- ① Increased jurisdiction a part of neighbourhood changes

eg fall of Hasina regime in Bangladesh.

② mobilisation of BSF capacity to meet challenges inside mainland territory

eg Punjab jurisdiction fettered into city territory

③ Recognition of expanding nature of threat → eg Khalistani elements

④ the stopping of organised crime as well ⇒ golden crescent's drug network in Punjab.

Challenges
of increasing
jurisdiction

→ ① Against federalism

→ loss of state control
over police

→ ② complaints of excess

eg BSF violence

→ ③ Armed forces in civilian

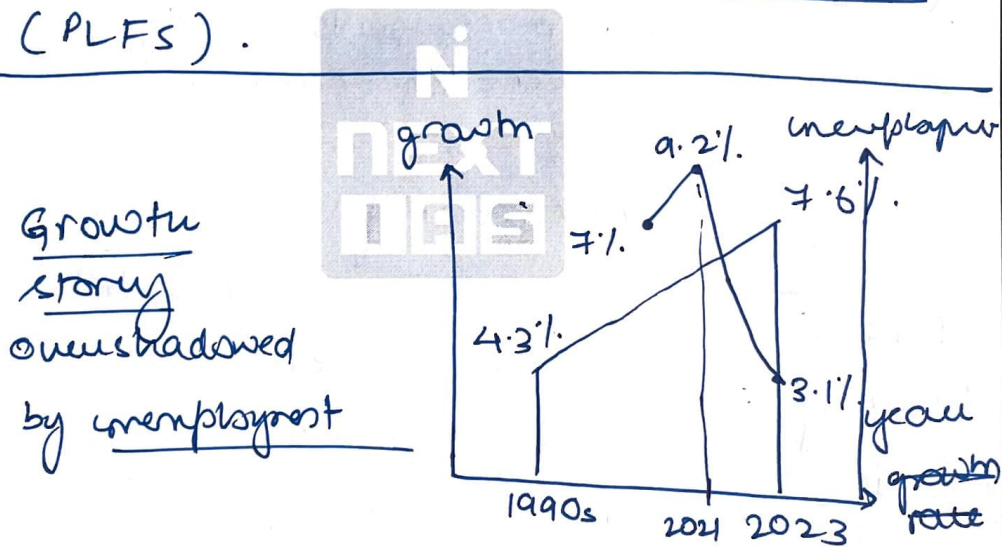
areas ⇒ worsening of conditions → eg AFSPA in Manipur

Thus, balancing internal security but also civil rights is essential for security

11. भारत की आर्थिक विकास की कहानी प्रायः बेरोजगारी की निरंतर चुनौतियों से प्रभावित होती है। संरचनात्मक बेरोजगारी की अवधारणा का विश्लेषण कीजिए और भारत की वर्तमान आर्थिक स्थिति के संदर्भ में इसकी प्रासंगिकता पर चर्चा कीजिए साथ ही समावेशी रोजगार को बढ़ावा देने के लिए नीतिगत उपाय सुझाइए। (15 अंक, 250 शब्द)

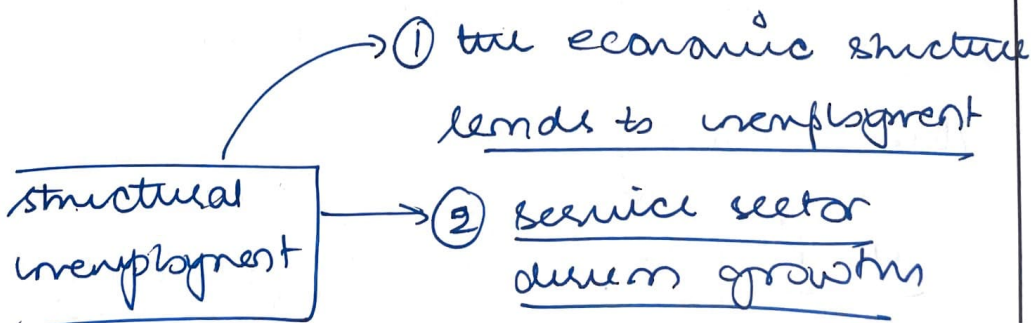
India's economic growth story is often overshadowed by the persistent challenges of unemployment. Analyze the concept of structural unemployment and discuss its relevance in the context of India's current economic situation. Suggest policy measures to promote inclusive job growth. (15 marks, 250 words)

India's unemployment rate has been the highest among developing economies at a 5.6% which has reduced to 3.1% in 2022-23 (PLFs).



→ unemployment

fig 1: Relationship between two.



eg 64% output with 22% employment

Relevance of structural unemployment

- ① India facing dilemma of "Jobless growth" $\rightarrow$ 3.1% unemployment
- ② Rise in employment met by increased employment in agriculture sector.
 eg) rural unemployment at 2.2% while urban at 6.6% (PLFS)
- ③ Rise in female labour force participation also due to 5% increase in female participation in agriculture.
- ④ Agriculture sector $\Rightarrow$ structural bias
 $\hookrightarrow$ 47% employment $\Rightarrow$ 17% GDP
- ⑤ Manufacturing sector stagnation
 $\hookrightarrow$ 17% GDP contribution since 1990s
- ⑥ Lack of jobs in manufacturing $\Rightarrow$ creation of dwarf firms
- ⑦ Service sector export driven growth

Policy measures for Inclusive growth

- ① Growth of employment in manufacturing sector $\Rightarrow$ discourage dwarf firms
 $\hookrightarrow$ regulate labour code from labour law
- ② concentration on infrastructure creation in tier 2 - tier 3 cities
 $\hookrightarrow$ prevent distress migration $\Rightarrow$ informal jobs $\Rightarrow$ cheapening of labour.
- ③ creation of jobs in food processing
 - $\swarrow$ surplus labour from agriculture
 - $\searrow$ decrease disguised unemployment
 - $\nearrow$ increase agri export
- ④ focus on skilling $\Rightarrow$ 45% by 2030
 $\hookrightarrow$ National Skill Development Mission

The recent protests in Bangladesh show that growth rate as a metric is insufficient. Thus goal for employment should be "sabke saath, sabka Vikaas"

12. भारत में क्षेत्रीय विकास को बढ़ावा देने में सूक्ष्म, लघु और मध्यम उद्यमों (MSMEs) की भूमिका पर चर्चा कीजिए। औद्योगिक विविधीकरण और उन्नत प्रौद्योगिकी प्राप्त करने में डैडने किस प्रकार योगदान दे सकते हैं?

(15 अंक, 250 शब्द)

Discuss the role of Micro, Small, and Medium Enterprises (MSMEs) in fostering regional growth in India. How can MSMEs contribute to achieving industrial diversification and technological advancement?
(15 marks, 250 words)

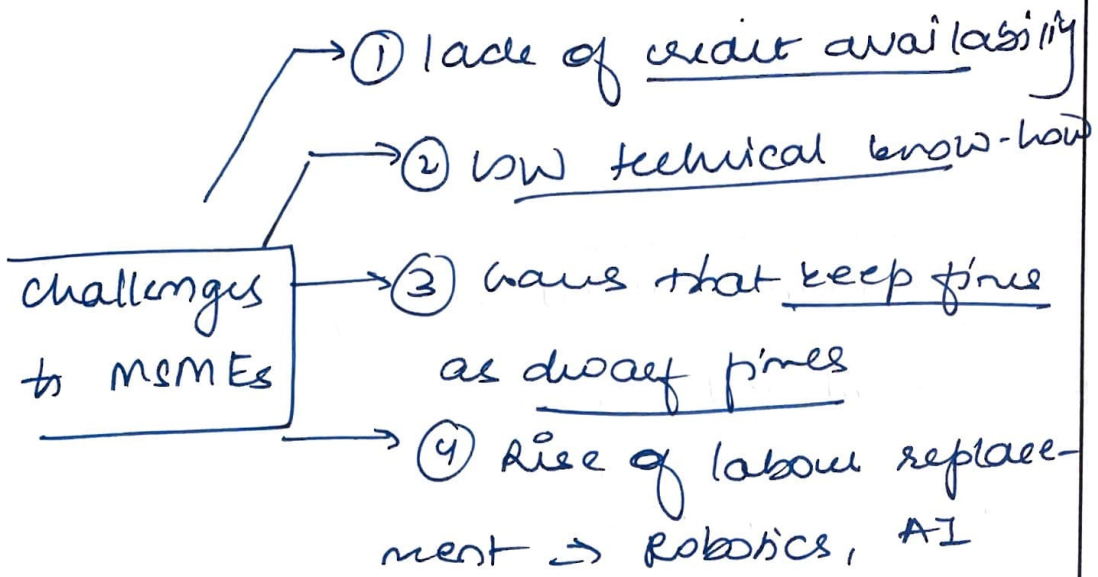
Micro, Small and Medium enterprises or MSME play a crucial role in industrial output of 43% as well a bulk of its employment (Economic survey 22')

Role of MSME in regional growth

- ① concentrated growth in India due to large corporates & PSUs
↳ eg 40% of India's GDP from 4 states.
- ② growth restricted to urban areas
↳ cities = 4% of land area ⇒ 65% of economic growth
- ③ MSME capacity usually in tier 2 & tier 3 cities.

- ④ usually large scale industries are foot loose or concentrated in decision making at bottom or top $\Rightarrow$ non-inclusive growth.
- ⑤ MSMEs build strong backward & forward linkage $\Rightarrow$ dispersed growth.
- ⑥ MSMEs support also from state governments $\Rightarrow$ (eg) Telangana, AP, Tamil Nadu, Chhattisgarh with special schemes.
- ⑦ Industrial diversification $\Rightarrow$ production as per capital as well as traditional production
eg Copra based MSMEs of Kerala registering double digit growth due to expanded export potential.
- ⑧ Technological advancement
 $\hookrightarrow$ especially in space sector

and emerging technologies such as AI



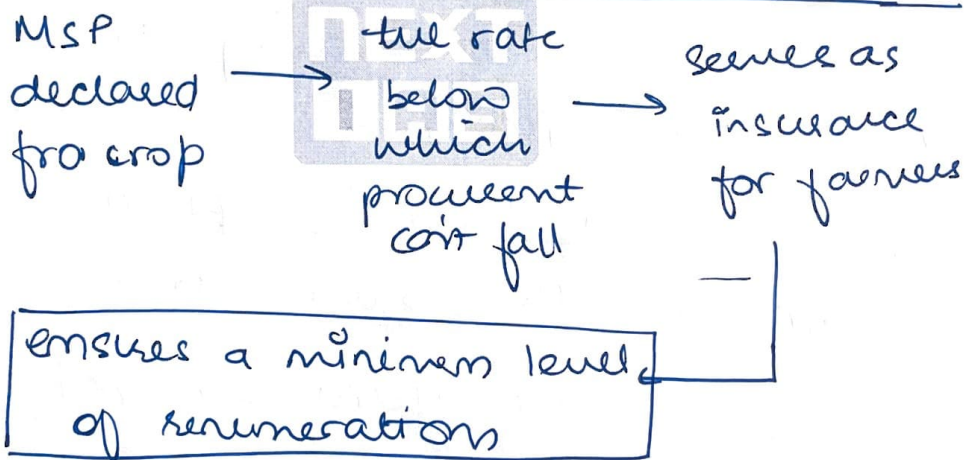
way forward :

- ① increased credit capacity → PM Mudra Yojana,
- ② focus on area-based support → eg PM Svanidhi ⇒ urban areas.
- ③ investment based criteria scrapped for turnover based criteria.

Thus, MSMEs hold the key for achieving SDG 8 of decent economic growth but for all sections & regions

13. "MSP का एकमात्र उद्देश्य किसानों को आकस्मिक मूल्य परिवर्तन के आघात से बचाना है"। क्या आपको लगता है कि MSP को वैधानिक बनाने से किसानों को आकस्मिक आघातों से बचाया जा सकेगा? MSP आधारित खरीद को प्रभावी बनाने के लिए अन्य कौन से उपाय किए जा सकते हैं? (15 अंक, 250 शब्द)
- "The sole point of MSP is to protect farmers from sudden price shock". Do you think legalization of MSP can insure farmers from sudden price shocks? What are the other measures which can be taken to make MSP-led procurement effective? (15 marks, 250 words)

Minimum support price or MSP
was constituted in order to serve
as a sudden price shock saving
mechanism for farmers.



How MSP legalization would insure farmers:

① Agriculture production as deeply
insure

② farmers would be guaranteed income from production → stay in production of crops → especially subsistence crops.

③ would make production more predictable

④ increased legalisation would also lead to less distress migration.

Why MSP legalisation not done?

① WTO - non compliant ⇒ would lead to court cases.

② huge fiscal burden of procurement

③ Shanta Kumar committee estimates that only 6% of farmers know of MSP.

④ low MSP responsible for skewed agriculture pattern → eg Rice - wheat due to high MSPs for the same.

⑤ legalisation would permanent stalis
↳ difficult to graduate from MSP

Measures to make MSP efficient

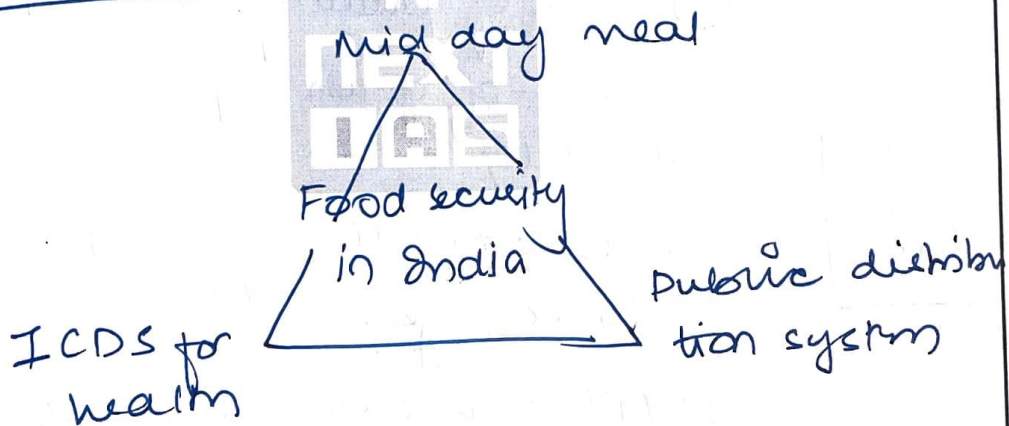
- ① decentralisation of procurement & distribution
eg 71% of FCI godowns in production
rather than distribution states.
- ② diversification of crops → pulses,
nutri-cereals and oil seeds
 ⇒ required for import substitution
and health.
- ③ reduce MSP allocation towards
wheat and rice.
- ④ schemes of distribution ⇒ PM-AASHA
rather than direct procurement

Further, MSP can't be made a
permanent measure as it keep agri-
culture as government rather than market
dependent and its labour force as captive

14. भारत में खाद्य सुरक्षा सुनिश्चित करने के लिए सार्वजनिक वितरण प्रणाली (PDS) में भारतीय खाद्य निगम (FCI) की भूमिका पर चर्चा कीजिए। भारतीय खाद्य निगम की दक्षता और प्रभावशीलता को बढ़ाने के लिए इसकी कार्यप्रणाली में आवश्यक सुधारों को सुझाइए। (15 अंक, 250 शब्द)

Discuss the role of the Food Corporation of India (FCI) in the Public Distribution System (PDS) to ensure food security in India. Suggest necessary reforms in the functioning of FCI to enhance its efficiency and effectiveness. (15 marks, 250 words)

The public distribution system of India is a social security net which ensures food security as well as nutritional and farmer security.



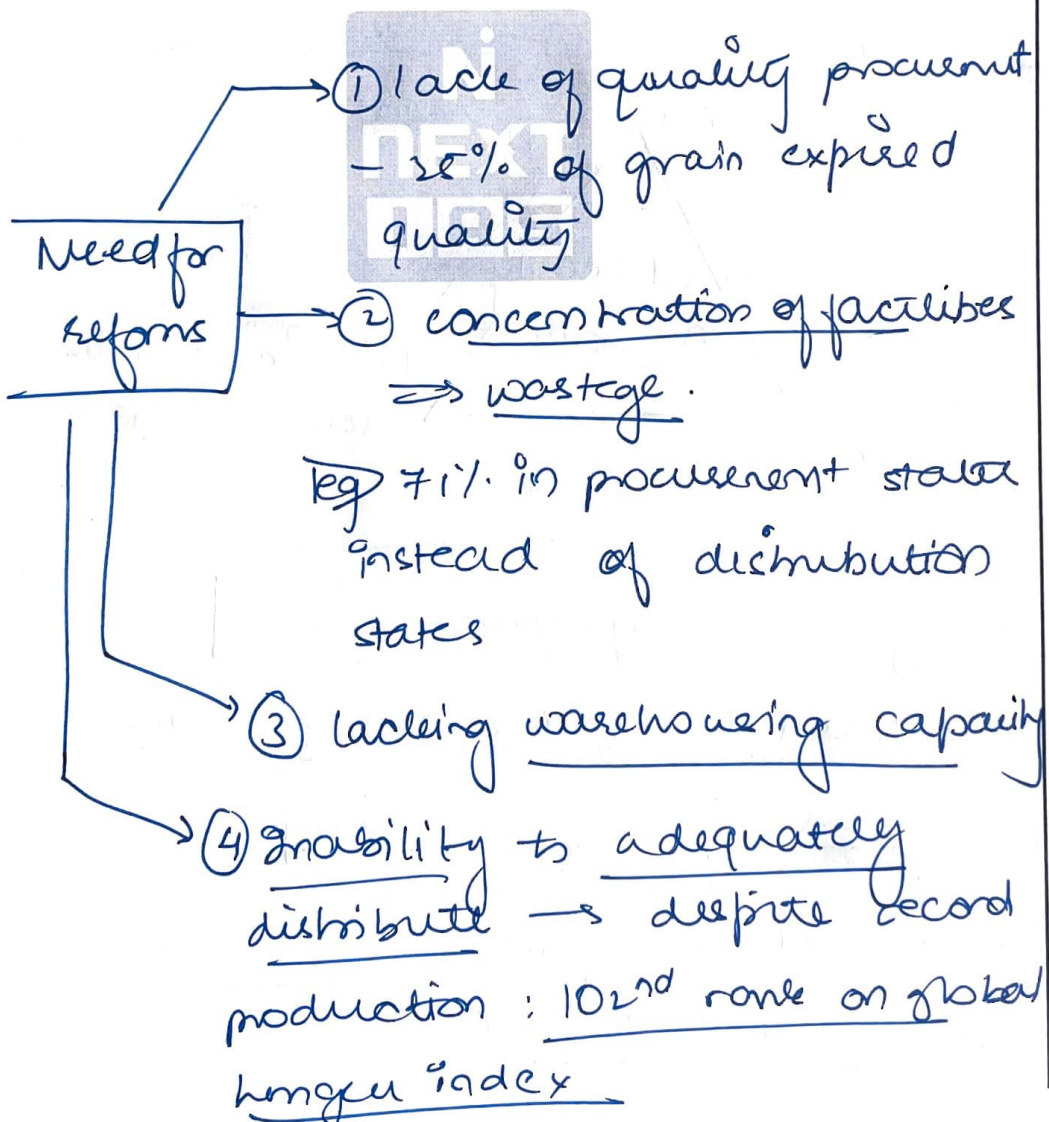
Role of Food Corporation of India

- ① Instituted to regulate & guarantee procurement for food security
- ② FCI acts as agent of procurement out of MSP regime.

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write on this margin

- ③ FCI responsible for procurement quality & warehousing
- ④ FCI directly distributes to the last mile agencies $\Rightarrow$ Anganwadis, schools, Anganwadis, etc.
- ⑤ FCI works with CEEA to set the MSP rates as per requirement



Recipe for efficiency:

- ① decentralisation of production & procurement → better geographical spread
- ② village level capacity ⇒ godowns and distribution at village level.
- ③ decrease government dependence by PM - AASHA scheme ⇒ price deficiency mechanisms
- ④ focus on warehousing & cold storage
- ⑤ create strong backward & forward linkages to avoid wastage.

SDG 2 for zero hunger requires the collaboration of agencies such as in National Food security programme but also improving efficiency of FCI.

15. भारत में कृषि उत्पादकता और खाद्य सुरक्षा बढ़ाने में नैनो प्रौद्योगिकी की भूमिका पर चर्चा कीजिए। नैनो-उर्वरकों और नैनो-कीटनाशकों के उपयोग के हाल के विकास/प्रगति और संभावित लाभों एवं जोखिमों पर प्रकाश डालिए। (15 अंक, 250 शब्द)

Discuss the role of nanotechnology on enhancing agricultural productivity and food security in India. Highlight recent developments and potential benefits and risks of use of nano-fertilizers and nano-pesticides. (15 marks, 250 words)

Nanotechnology can be defined as the creation of technology at the nanoscale of 10^{-9} . It is particularly impacting the field of agriculture.

Role of nanotech on

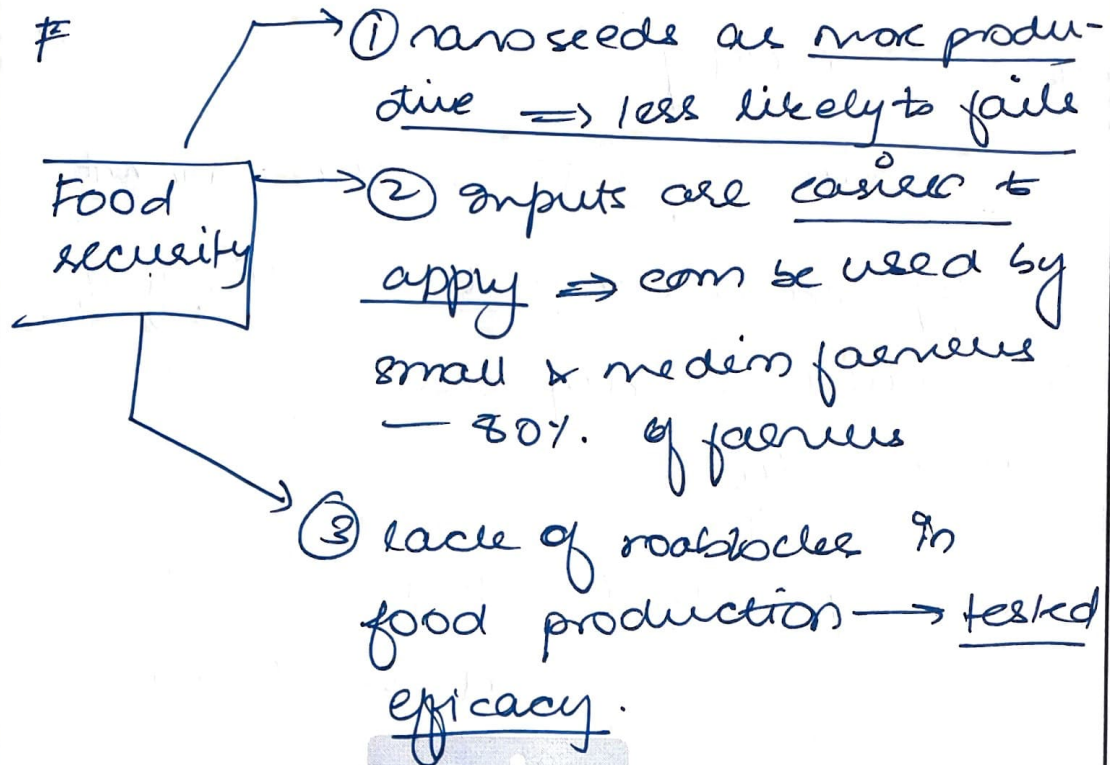
Agriculture productivity

→ ① Improve the delivery of agricultural input

eg Nano-urea has better absorption rate

→ ② can lead to reduced input ⇒ eg nano-fertilizer quantity is less ⇒ reduce cost

of input ⇒ better return.



Benefits:

- ① food security $\rightarrow$ higher production
- ② lower cost of input
- ③ better utilisation of input
- ④ Ability to bring technological progress $\rightarrow$ eg Neem for surplus in Neem leaf subsidy.
- ⑤ production-surplus $\Rightarrow$ export $\Rightarrow$ earn foreign exchange
- ⑥ make India a leader in nano-tech creations

Risks associated:

- ① Uncertain impacts on the environment
- ② As opposed to nanotech in other fields, this would directly feed into the human body.
- ③ lead to perpetual pollution at a nano scale $\Rightarrow$ difficult to clean
- ④ would lead to further commodification of agriculture.

way forward $\rightarrow$ ① Precautionary principle in adoption

$\rightarrow$ ② driven by government rather than for profit agendas

Thus, nanotech is a groundbreaking technology but a precautionary principle is required especially with respect to agriculture.

16. 2023 का भौतिकी का नोबेल पुरस्कार क्वांटम डॉट्स के संश्लेषण की खोज के लिए एकिमोव, रुस और बावेन्डी को संयुक्त रूप से दिया गया। इस संदर्भ में क्वांटम डॉट्स के अनुप्रयोगों पर चर्चा कीजिए। (15 अंक, 250 शब्द)
The Nobel Prize in Physics of 2023 was jointly awarded to Ekimov, Brus and Bawendi for the discovery of synthesis of quantum dots. In this context, discuss the applications of quantum dots. (15 marks, 250 words)

Quantum dots can be understood as semiconductor particles with scale of nanometers in size. They merge the field of Quantum mechanics and nanotechnology.

Application:

- ① used in LED displays on TVs & Laptops
- ② used for LED in light production
- ③ used in semiconductors
- ④ Medical diagnostic
- ⑤ Agricultural applications.

17. भारत में जैव विविधता संरक्षण में आरक्षित क्षेत्रों (Protected areas) की भूमिका का मूल्यांकन कीजिए। भारत की जैव विविधता को संरक्षित करने में राष्ट्रीय उद्यान, वन्यजीव अभयारण्य और बायोस्फीयर रिजर्व (जैवमंडल निचय) कितने प्रभावी रहे हैं? (15 अंक, 250 शब्द)
- Evaluate the role of protected areas in biodiversity conservation in India. How effective have national parks, wildlife sanctuaries, and biosphere reserves been in preserving India's biodiversity? (15 marks, 250 words)

Biodiversity conservation is a mandate outlined in the directive principles of 48 Article 48 (A) as well as Fundamental duties.

Role of protected areas:

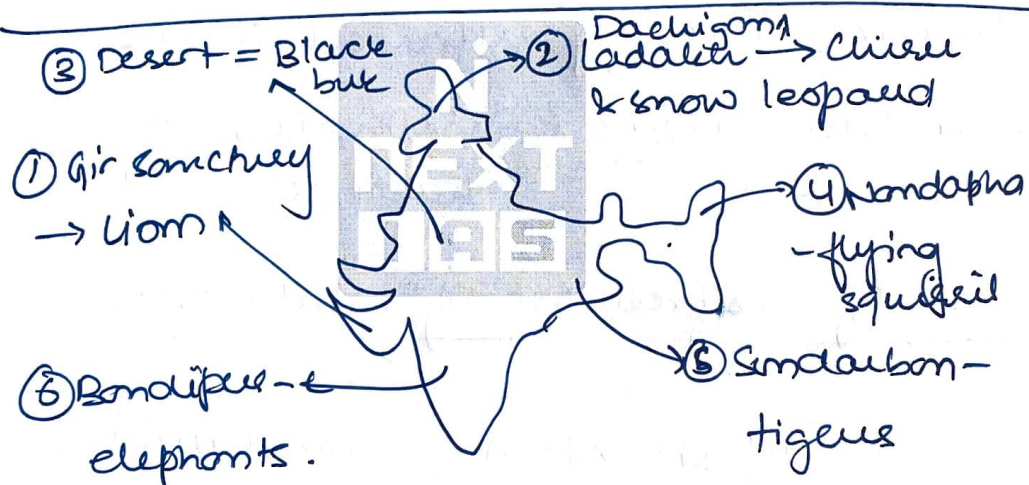
- ① mandates the practice of certain areas should be left as untouched of human interference
- ② recognises the Anthropogenic impact on environment and gives space for course correction.
- ③ compliant with international agreement
eg UNCED of 1972
Rio Agenda of 1992

④ helps entrust ownership back to the original guardians $\Rightarrow$ Tribals

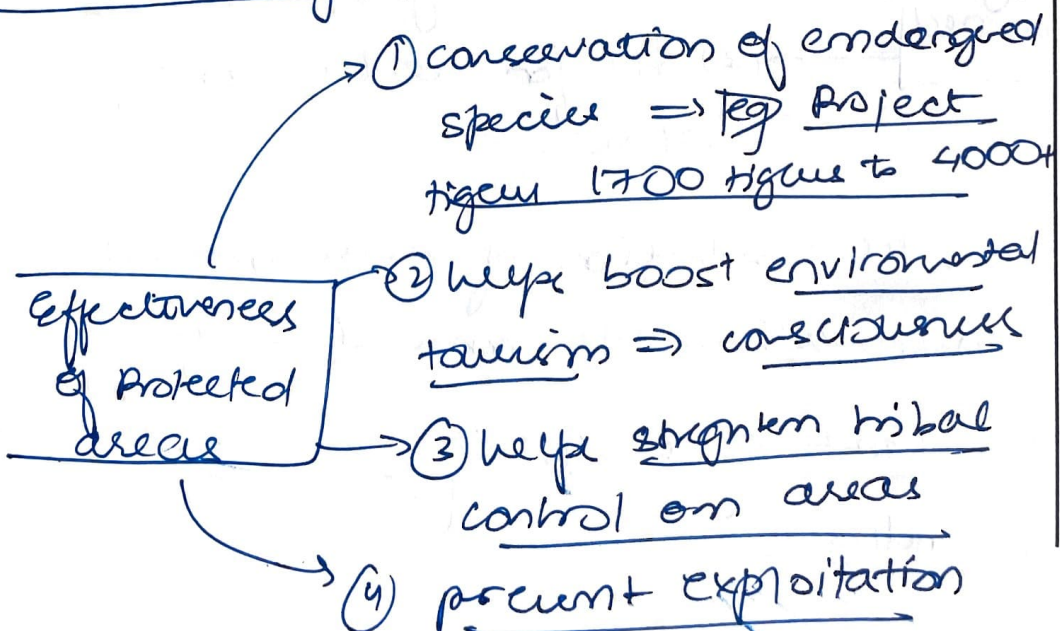
eg Rights of forest dwellers Act, 2006

⑤ helps create green cover which combats climate change.

⑥ creates safety nets for endangered animals - which are near extinction

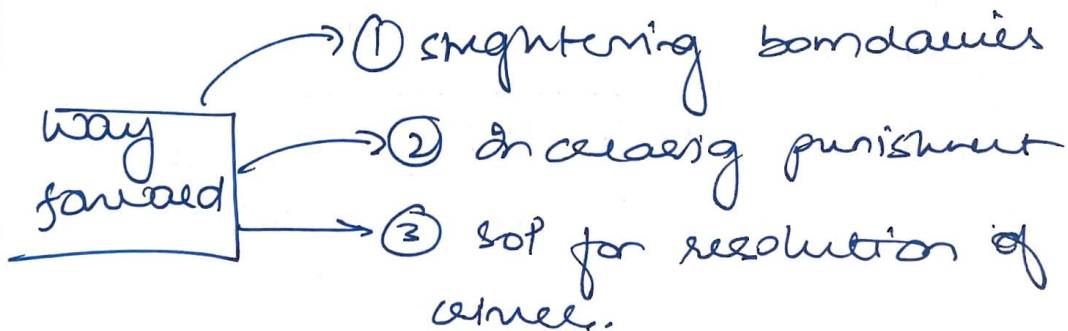


bio diversity & National parks & reserves.



challenge faced by protected areas:

- ① the abuse of EIA mechanism
eg exemptions → chandhon project
via valley offorever park.
- ② the abuse by corrupt forest officials
eg Red sanders again falls from
vulnerable to endangered category
- ③ human activity allowed in the
boundary area ⇒ destruction of
habitat
- ④ lack of enforcement of tribal rights



The resolution of development -
conservation dilemma lies at
the heart of biodiversity management
in India.

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18. भारत में पार्टिकुलेट मैटर (PM2.5 and PM10) और ओजोन प्रदूषण के उच्च स्तर होने के क्या कारण हैं? पार्टिकुलेट मैटर और ओजोन प्रदूषण को कम करने के लिए सरकार द्वारा किए गए विभिन्न प्रयास कितने प्रभावी रहे हैं? (15 अंक, 250 शब्द)

What the causes of high levels of particulate matter (PM2.5 and PM10) and ozone pollution in India. How effective are the various steps taken by the government to mitigate particulate matter and ozone pollution? (15 marks, 250 marks)

Three of the top ³ most polluted cities in the world are in India as per the Environment Protection Index. There are due to high PM 2.5 & 10 and ozone pollution.

Causes of high Particulate matter & ozone:

- ① High agricultural output → leads to creation of particulate matter
by stubble burning ⇒ PM 2.5 & PM 10
- ② creation of bio fuels PM ⇒ 12 GW of energy in India derived from unrefined biofuel ⇒ PM 10 & 2.5

- ③ creation of ground level ozone or tropospheric ozone due to vehicular pollution
- ④ construction and transport as large sources of Particulate matter pollution.
- ⑤ Emission of ozone & PM 2.5 & 10 from cooling systems.

Step to mitigate:

- ① National Action Plan on combating Pollution — NAAQS
- ② Swachh Bharat Mission's Air Quality Index of 6 levels.
- ③ Supreme court mandated Graded Action Plan or GRAP for Delhi during pollution.
- ④ transition from BS IV to BS VI

to reduce NO_2 & SO_2 as well as
PM 2.5 & 10 pollution

⑤ switching to electric vehicles $\Rightarrow$
FAME to make production more
attractive.

⑥ Use of construction guidelines in
order to reduce PM 2.5 & 10

⑦ Innovative solutions such as
Fly Ash production to utilise
PM 2.5 & 10

way ahead $\rightarrow$ ① invest in public transport
 $\rightarrow$ ② heavy focus on environment
conserving fuel $\Rightarrow$ eg
renewable energy

Thus, tackling of pollution is
essential for SDG 13 on Climate Action
but also ensuring quality of life.

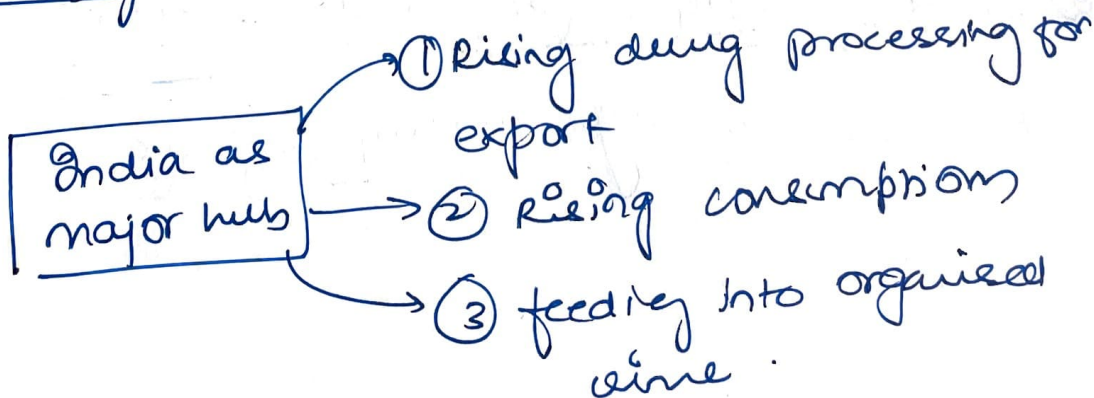
19. अंतर्राष्ट्रीय नारकोटिक्स नियंत्रण बोर्ड (INCB) रिपोर्ट 2023 दक्षिण एशिया में मादक पदार्थों की तस्करी के बढ़ते खतरे को प्रदर्शित करती है, जिसका कि भारत एक प्रमुख केंद्र है। भारत के संदर्भ में इस चुनौती के विभिन्न आयामों का विश्लेषण कीजिए। साथ ही, इससे निपटने के लिए बहु-आयामी दृष्टिकोण भी सुझाइए। (15 अंक, 250 शब्द)

The International Narcotics Control Board (INCB) Report 2023 highlights a growing menace of drug trafficking in South Asia, with India being a major hub. Analyze the various dimensions of this challenge with respect to India. Also suggest a multi-pronged approach to address it. (15 marks, 250 words)

India's unique position in the middle of two large drug producing areas of Golden Triangle and Golden Crescent make it a major sufferer under menace of drug trafficking.



fig 1 : India's location



Various dimensions

I Security

- ① drug trafficking as a feeder industry into other organised crime
eg Arms dealing of Taliban bought with opium money
- ② search for profit $\Rightarrow$ violation of border control.

II Developmental

- ① drugs arrest the development of society $\Rightarrow$ eg falling employment rate due to drug menace in Punjab
- ② leads to development of alternate economy.

III Mind of people

- ① Justification of illegal activities for material gain
- ② support to illegal network $\rightarrow$ terrorists & insurgents.

Multi pronged approach

- ① strengthening of border infrastructure
eg BOLD - GIT for infrastructure
- ② focus on transboundary movement
— especially free movement regime
of myanmar at potential area
- ③ Education & awareness.
↳ eg Nasha - Mukh Bhaarat
- ④ Investigation & tackling of transborder crimes → eg operation chetani
against insurgents in Myanmar
& other drug dens.
- ⑤ International collaboration
eg Cartagena convention

Thus, drug removal seems as a
flame to the fire of organised crime
and should be curtailed at all
costs.

20. वामपंथी उग्रवाद के प्रति भारत की प्रतिक्रिया (कारवाई) में नक्सलवाद के मूल कारणों को दूर करने के लिए कठोर सुरक्षा उपायों के साथ-साथ सामाजिक-आर्थिक नीतियों और संवाद जैसे नरम दृष्टिकोणों/उपागमों (Soft approaches) को एकीकृत करने की आवश्यकता है। चर्चा कीजिए।
(15 अंक, 250 शब्द)
- India's response to left wing extremism needs to integrate soft approaches like socio-economic policies and dialogue along with hard security measures to address the root causes of Naxalism. Discuss.
(15 marks, 250 words)

Despite a 73% reduction in
instances of left wing extremism
instances over the last decade, it
remains a threat to over 46 districts
in India. (Home Ministry).

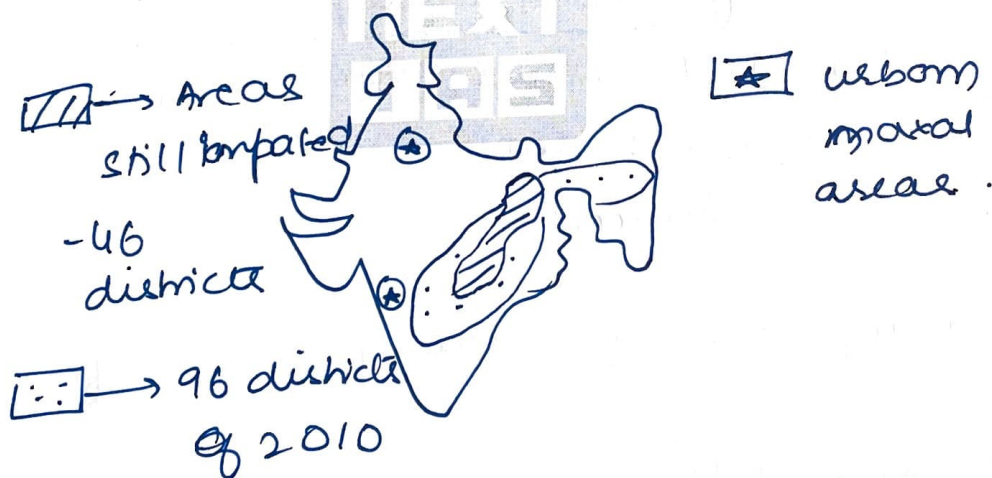
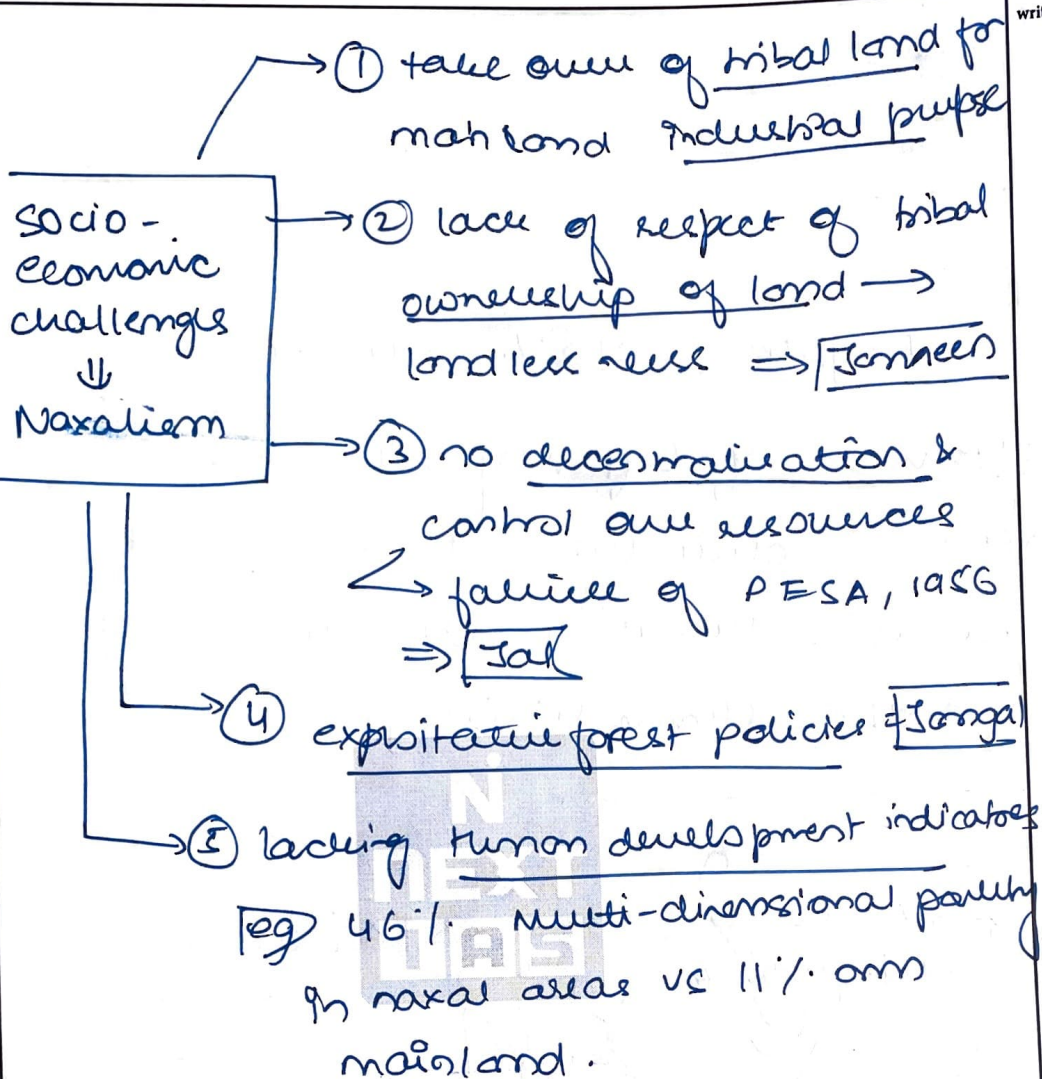


fig 1: spread of left wing extremism

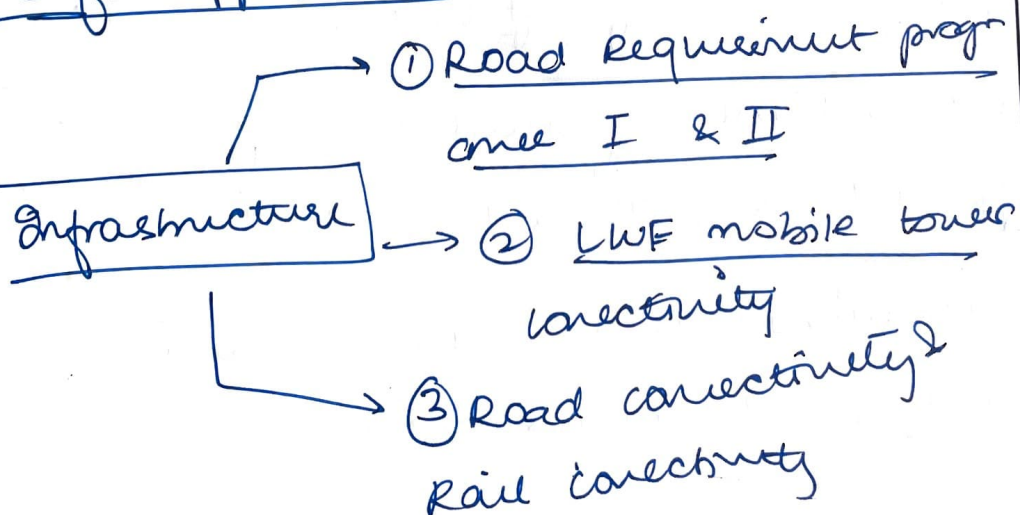
Why combination of hard & soft approaches required:

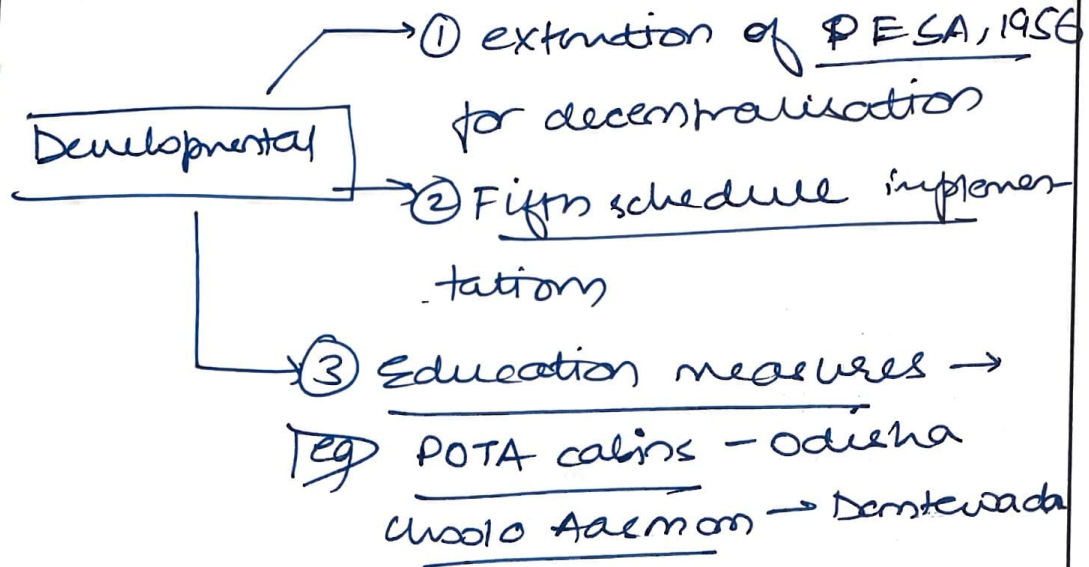
- ① Naxalism has a socio-economic root which needs to be addressed



∴ multi pronged measure of Hard + soft

Soft Approaches:





Hard approaches

- ① Equipping CRPF with skills and armaments to defeat Naxals.
- ② Training a local approach → Bastion
Battalions
- ③ collaboration with local police
- ④ Intelligence crackdowns
- ⑤ Best practices - Teg greyhound of Andhra Pradesh.

Thus, Left wing extremists can be defeated by turning the vicious cycle of violence to virtuous cycle of development.