

Time Allowed : Three Hours
समय : तीन घंटे



Maximum Marks : 250
अधिकतम अंक : 250

GENERAL STUDIES / सामान्य अध्ययन

Name Of Candidate परीक्षार्थी का नाम	Anshul Yadav		
Roll No./अनुक्रमांक	1910105656	Medium/माध्यम	English <input checked="" type="checkbox"/> हिंदी <input type="checkbox"/>
Center Code/परीक्षा केंद्र	Online	Date/दिनांक	21 July 2024

*Center Code : For Online - 1900 / Delhi : Karol bagh - 1901, ORN - 1902, Mukharji Nagar - 1903 / Patna : Boring Rd. - 2001 / Hyderabad : Jawahar Nagar - 2101

INDEX TABLE / अनुक्रमणिका			INSTRUCTION / अनुदेश	
Q. No. प्र.सं.	Max. Marks अधिकतम अंक	Marks Obtained प्राप्तांक	<p>1. Please do furnish Name, Email, Roll No and Mobile in the answer sheet. कृपया उत्तर-पुस्तिका में नाम, ईमेल, रोल नंबर और मोबाइल नंबर भरें।</p> <p>2. There are TWENTY questions printed in ENGLISH & HINDI, all questions are compulsory. उत्तर पुस्तिका में अंग्रेजी/हिंदी में बीस प्रश्न दिए गए हैं, सभी प्रश्न अनिवार्य हैं।</p> <p>3. The number of marks carried by a question/part is indicated against it. प्रत्येक प्रश्न/भाग के लिए निर्धारित अंक उसके सामने अंकित किए गए हैं।</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. उत्तर प्रवेश पत्र में अधिकृत माध्यम में लिखे जाने चाहिए, जो कि दिए गए स्थान में इस प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के कवर पर स्पष्ट रूप से लिखा जाना चाहिए।</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. प्रश्नों में शब्द सीमा, यदि निर्दिष्ट हो, का पालन किया जाए। प्रश्न-सह-उत्तर पुस्तिका में खाली छोड़े गये किसी भी पृष्ठ या पृष्ठ के भाग को स्पष्ट रूप से काट दें।</p>	
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Total Marks/कुल अंक :			Mode Of Examination/ परीक्षा की विधि : Online	Online/ऑनलाइन <input checked="" type="checkbox"/> Offline/ऑफलाइन <input type="checkbox"/>
*Examiner's Discretion is the marks awarded at the discretion of the examiner 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. मूल्यांकन कर्ता का विवेक अंक, आपकी लिखावट, प्रस्तुति, आरेखों के उपयोग, फ्लोचार्ट, तथ्यों और आंकड़ों या समग्र रूप किसी अन्य विषय वस्तु, जो मूल्यांकन कर्ता को आपकी कॉपी में पसंद आयी के आधार पर (लेकिन इन्हीं तक सीमित नहीं) पर दिए गए अंक हैं।			For Office Use Only / केवल कार्यालय प्रयोग हेतु	
ECN CODE/ ईसीएन कोड :			EG/ईजी : ① ② ③ ④ ⑤	Evaluation Date/ मूल्यांकन तिथि :

Note: Students are expected to incorporate suggestions from the feedback provided in the answers. Discussion classes for the tests are also available online in your portal to aid in your preparation. Further, students are requested to see the good copies of the tests and learn from them. You can also discuss your copy with a Mentor and discover ways and means to improve your answers, or if you have any issues with this test / copy. Ask specific questions, to get specific answers.

EXAMINER'S REMARKS

CRITERIA FOR THE FEEDBACK SECTION AT THE END OF EACH QUESTION

1. **AWIS = Answered What is Asked.** This means whether you have addressed the core demand of the question or not. Addressing the core demand of the question gets you an objectively fair score. It is examiner's perception if you have understood the question and if you know the answer in the first place. Creative answer writing, sometimes missing the core demand, may fetch very high or very low scores, and exposes your answer to the subjectivity of the examiner.
2. **CD & VA = Content Density & Value Addition.** Examiner will evaluate the quality and quantity of your content in the answer. In the same word limit and space limit have you (a) written what is asked (b) gone beyond what is asked (c) enriched answers through combination of (but not all!) suggestions, ideas, quotes, flowcharts, diagrams, facts and figures, data etc. This affects objective components of assessment.
3. **S & F = Structure & Flow** = Whether you have structured your answer properly or not. Whether the answer has been broken into parts and sub-parts and each part has been addressed appropriately or not. Whether the flow of the answer is maintained. Affects both subjective and objective components of assessment.
4. **P & R** = How your answer performs on the criteria of **presentation, ease of read, clarity and apparent effort** in writing the answer. This affects the subjective components of assessment.

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6-1

Q.1) How far do you agree that a robust domestic demand is the most important driver of India's economic growth? What are other factors that influence the growth trajectory of the country?

(10 marks, 150 words)

India is expected to grow at $\sim 7.0\%$ in FY 25 (IMF). Sustaining high growth rate requires robust domestic demand and sustained investment.

Robust domestic demand as key driver of Economic growth —

1) (Consumption expenditure) as key component of India's GVA
 $\sim 58\%$ of GDP (FY24)

2) Virtuous cycle of Growth with moderate inflation

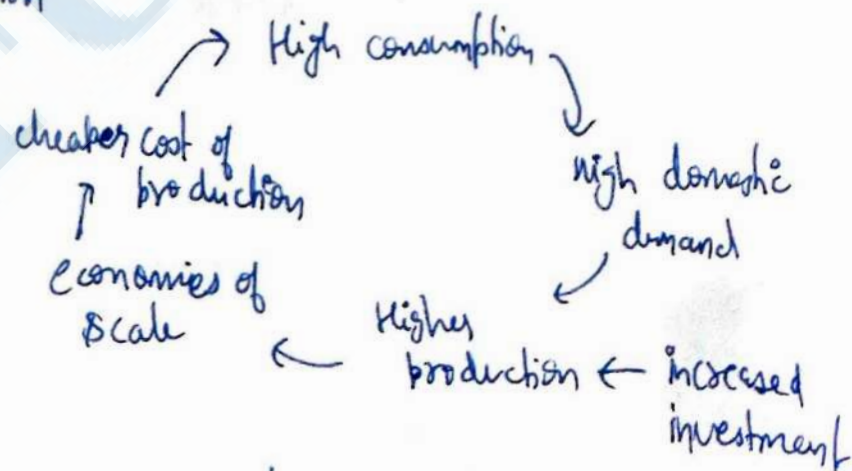


Fig: Virtuous cycle.

3) lowers ICOR further (eg) ~3.5 in FY23
boosting GDP growth with efficient firms

However, Indian economy has structural
barriers —

- 1) state-led demand generation →
High Capex (11 trillion rupees) FY23
- 2) increased stagnation of domestic demand
pushed economy to export-led growth.

factors affecting growth trajectory —

- 1) Manufacturing sector → stagnat at ~18% GVA
- 2) "Dwarfism in MSME" → lacking growth
& expansion

India should follow export-led growth model
for sustainable growth & Viksit Bharat

by 2047.

Q-12

Q.2) Macroeconomic stability is not solely dependent on the quantity of foreign exchange reserves, but also on the strategy and sources on which they are built. Discuss in an Indian context.

(10 marks, 150 words)

Recently Indian forex reserves crossed the mark of \$ 650 Bn ranking 3rd largest forex reserves in the world.

Macroeconomic stability dependant on forex reserves

- 1) import cover of atleast 6 months to navigate unforeseen contingencies
- 2) buffer against black swan events (e) COVID-19
- 3) Rupee exchange rate stability (e) RBI sells dollar to check rupee depreciation.

However, forex reserves & strategy and sources also matter for macroeconomic stability -

- 1) optimal mix of Gold, foreign securities and cash reserves
- 2) Diversification of assets
(e) India → largely holds \$ making vulnerable to US economy shocks as in 2008 crisis

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6-3

Q.3) DPI (Digital Public Infrastructure) is a critical enabler of digital transformation for both businesses and citizens; however, it comes with its own set of challenges. Examine.

(10 marks, 150 words)

"Digital public infrastructure is a global & public good"

— PM Modi

DPI as a critical enabler of digital transformation of citizens & businesses —

I — Citizen

↳ Citizen-centric services ^{digital} ~~eg~~ Aadhaar as identity

↳ JAM trinity → DBT transfer reduced corruption & leakages.

↳ distribution of public goods efficiently

eg COWIN - vaccine portal → digital certificates.

↳ Digital India initiative

— DigiLocker for vehicle, school certificates.

Businesses

↳ ONDC → enable aggregation & integration of retail stores in e-commerce

↳ Pamresh Portal → single window clearance
improving EoB.

However, it has several challenges —

1) Digital divide → lack of internet-enabled mobiles
eg) only ~89 crores have internet access (IAMAI report 2023)

2) UI/UX issues → lack of citizen friendly sites
eg) Accessibility issues for disabled

3) Privacy & data breach issues → wide ranging exemption to law enforcement is
[DPDP Act 2020]

India should push Digital Public Infrastructure as a force of Global Good for Global South

24

Q.4) The skewed emphasis on certain crops has distorted the cropping pattern in India, which has led to grave socio-economic and environmental consequences. Elaborate. (10 marks, 150 words)

India's total production crossed 300 mt mark in 2023 making it world's 2nd largest cereal producer and 3rd largest fruits & vegetables producer.

skewed emphasis on certain crops distorting cropping pattern —

1) overproduction of wheat & rice

↳ overflowing buffer stocks

↳ high MAP distorting market prices

2) lower share of pulses & millets

↳ required for balanced nutrient intake

3) High import cost of vegetable oil.

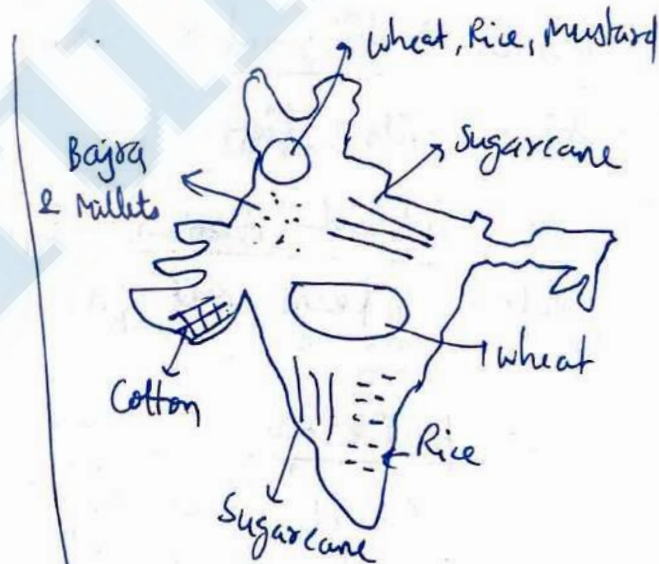


Fig: Crop distribution in India

4) WTO issues for Sugarcane FRP
↳ Brazil initiated complaint

Grave socio-economic & environmental consequences -

- 1) Virtual water export → Rice & Sugarcane are water-guzzling crops
- 2) Overirrigation & soil salinity issues for rice → SRI method.
- 3) Skewed Nutritional outcome → lack of protein-rich diet
- 4) High Current Account deficit → Import of pulses, palm oil from Indonesia

Super food crops
↳ Ragi, Aisi etc
Balance d MSP

Strategy

↳ Millets as "Shree-Bhang"

India should promote ~~As~~ crop diversification for doubling farmers income
(Ashok Dalwai Committee)

Q-5

Q.5) Private participation in propelling India's space journey is widely acknowledged but is yet to be fully tapped. In light of the statement, analyse the hurdles faced by the private sector and also recommend measures to unlock greater private participation in the space economy.

(10 marks, 150 words)

India is aspiring to become dominant space player with advent of "space race" between ~~the~~ USA & China new Cold War.

Private participation → not yet fully tapped

1) highly skilled workforce → demographic dividend
→ 80% popⁿ in 15-59 age

2) availability of capital & credit

eg \$ 60 Bn FDI in FY23

3) capacity-building → ISRO scientists → with rehabilitation of technical know-how.

Hurdles faced by private sector —

1) regulatory challenges → lack of coherent space policy
eg arbitrary export & import bans of electronic components.

2) FDI challenges → poor infrastructure as bottleneck of limited capital availability

3) Poor R&D India - 0.7% of GDP
US, China - 2.3% of GDP

4) poor manufacturing capacity → in semiconductors ; electronics components.

Measures to unlock high private sector participation —

1) leasing & sharing of ISRO launch facilities — "handholding approach"

2) execution & implementation of India space-policy 2023

3) PLI and government capital support
(eg) subsidies linked to indigenous content

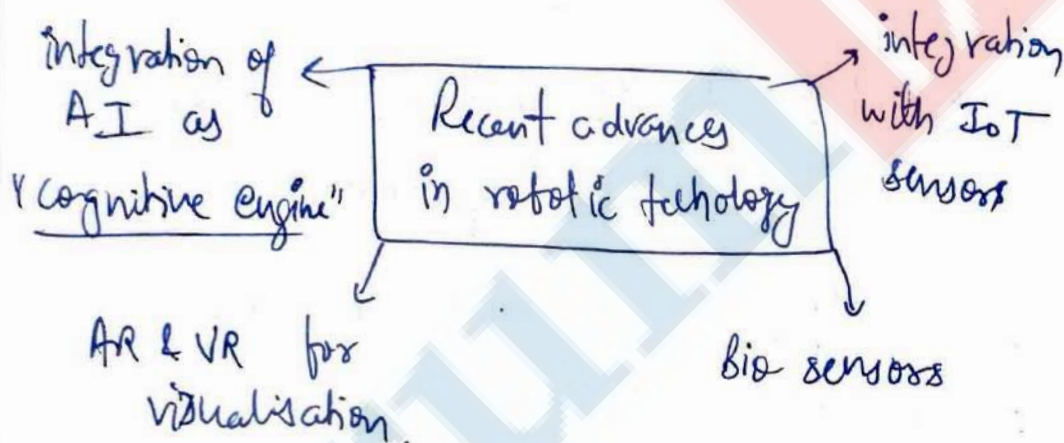
India should tap into its space potential and handhold its key startups such as Agnikul & Skylark.

Q.6

Q.6) With recent advances in technology, robots are now equipped to perform more than just conventional and routine tasks, which brings new opportunities as well as risks. In this context, evaluate the future potential of the robotics sector.

(10 marks, 150 words)

Robots are going to revolutionise 21st Century in diverse field and innumerable applications in IR 4.0.



New Opportunities in Robotics sector -

1) Robotic industries → high precision & skilled manufacturing

eg) ABB robots in automobile

2) Humanoids with AI functioning as Brain of robots eg) Tesla robots

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3) Augment labor shortage

(eg) robotic delivery of goods by Amazon

4) Robotic swarms → defence applications

(eg) Quadcopters etc

Risks posed by new Robotic breakthroughs -

1) Dystopian robotic swarms with

Increased autonomous operations

2) Unemployment challenges → robots

replacing humans as workers

3) Health challenges → robots functioning

as routine tasks → lifestyle diseases.

like Obesity & Diabetes etc.

4) Lethal robots (eg) China → robot army

India should focus on robotic manufacturing to boost exports & domestic capacity.

Q-7

Q.7) Write an explanatory note on the causes and impacts of avalanches. Also, highlight the various strategies to mitigate its impact, with a special emphasis on NDMA guidelines. (10 marks, 150 words)

Avalanches are mass movements of snow due to gravitational pull or earthquakes, landslides, volcanic eruptions etc.

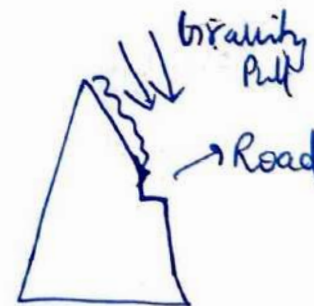
Causes of ~~volcan~~ avalanches -

1) Natural

- ↳ Gravity pulling large mass of snow
- ↳ Earthquakes causing shockwaves on snow capped mountains (eg) Himalayas
- ↳ Volcanic eruption with force
- (eg) Andisitic lava eruption

2) Anthropogenic

- ↳ unchecked construction activities (eg) Highways on mountains



- 2) Dam-induced seismicity (eg) Tehri dam in Himachal

Impact of Avalanches

- 1) loss of lives & livelihoods
- 2) mass washing leads to erosion of soil
- 3) triggers earthquakes & landslides
- 4) destruction of property.

Strategies to mitigate

1) Prevention

- Bunding of slopes
- engineering techniques
- CDRP for infra

2) Preparedness & Response

- "Sendai framework" for DRR

3) Recovery

↳ "Build Back better"

↳ Rehabilitation of affected people

Avalanches & Glots have exacerbated due to Climate change. NDMA guidelines must be followed for disaster-resilient India

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0-8

Q.8) Technology plays a multidimensional role in augmenting the disaster management apparatus of the country. Discuss. Also, bring out the measures needed to enhance the usage of such technologies in managing disasters. (10 marks, 150 words)

About 75% of India's area is disaster prone making it highly vulnerable to loss of lives & livelihood

$$\text{Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity}}$$

Technology augmenting disaster management apparatus of India —

1) Prevention

↳ engineering techniques such as rolling falls for earthquake resistant buildings

↳ Bio-shields as natural barriers

↳ Odisha → cyclone deaths reduced to 7 in 2023

2) Preparedness & Response

↳ Early warning systems

↳ INCOIS Hyderabad for Tsunami

- ↳ regular measurement of seismic activity.
- ↳ Geo-spatial mapping of GLOFs, landslides.

Recovery

- ↳ HADR operations using autonomous vehicles & Drones (eg) COVID-19 medicines using Drone
- ↳ Compressed hospital droppable package

Measures to enhance usage of such technologies —

- 1) use of AI for disaster prediction & monitoring (eg) Big data analysis of disasters.
- 2) Drones as frontline warriors reaching difficult terrain
- 3) sharing of Best practices (eg) CORI

Technology must be augmented with community-based disaster management to follow "Sendai Framework"

69

Q.9) Outlining the various cyber threats faced by India, assess the state of the country's preparedness to deal with the same. (10 marks, 150 words)

India is most affected cyberattacked country in the world (~18 lakh incidents in 2022).

Cyber threats faced by India -

- 1) Ransomware & malwares corrupting files in return for money
- 2) Banking & financial frauds
eg phishing for debit card details etc
- 3) Role of state-sponsored attacks
↳ Chinese MSS attacking India's critical infra eg 2022 telecom attacks
- 4) deeptech attacks eg using deepfakes, voice cloning etc.

State of country's preparedness -

- 1) CERT-In for checking vulnerabilities in softwares

- 2) Programmes to increase Cyber awareness
& hygiene eg "Cyber Surakshit Bharat"
- 3) Regular training & capacity-building
programmes eg Cyber-Saakshita diwas
- 4) Legal measures → IT Act 2000 &
DPDP Act 2023 for privacy & data issues
- 5) Cyber Crime cells of police & MHA

However some lacunae —

- 1) dealing with new age crimes using
AI & deepfake
- 2) Poor justice delivery → High pendency of
cases (~4.89 crore)

India should adopt National Cybersecurity
Strategy to ensure "Cyber-Saakshita
Bharat"



Q-10

Q.10) Explain how the geographical location of India makes it extremely vulnerable to the menace of drug trafficking. What are the various internal security threats posed by drug trafficking?
(10 marks, 150 words)

India is located in extremely vulnerable and dangerous neighborhood of South Asia lured with Narcotics & terrorism.

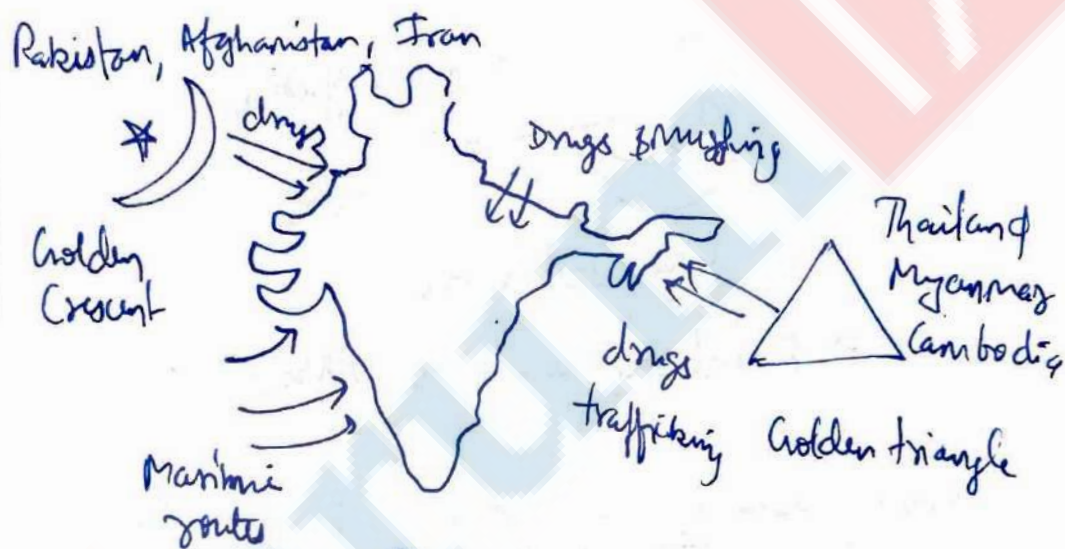


Fig: Drugs in India

Geographic vulnerability of drug trafficking -

- Middle of two largest Narcotics hotspot
↳ channel for smuggling route

2) Black Hole Syndrome → converge of lab state sponsored terror & Myanmar insurgent.

Internal Security threats posed by drug trafficking —

➤ terror financing using drug money

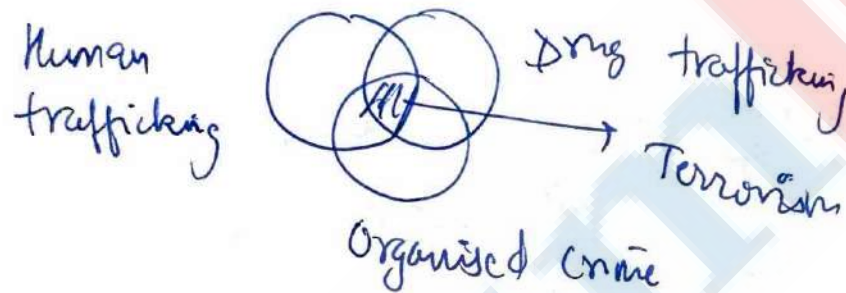


Fig 1 unholy nexus of terror

2) Drone delivery of drugs to destroy youth potential Δ hijal border

Demographic dividend \Rightarrow demographic disaster

India should increase drug de-addiction centres along with strengthening intelligence to curb drug-menace.



Q.11

Q.11) Inclusive growth is a roadmap to intergenerational equity, redistribution of wealth, and employment generation. Explain. Also, discuss the steps taken by the government towards achieving inclusive growth. (15 marks, 250 words)

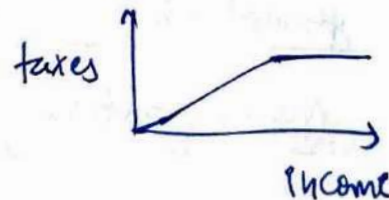
Inclusive growth refers to both process and outcome where benefits of development are shared equitably. (UNDP)

Roadmap to intergenerational equity

- 1) Sustainable development → without compromising the needs of the future
- 2) low Budget deficit → low accumulation of public debt
eg FRBM target → 3.5%
current → 5.1%.

Redistribution of wealth

- 1) Welfare state → progressive taxation



- 2) Social security benefits to poor citizens
- 3) Capacity Building (Amartya Sen)

2) Employment generation

- 1) Boost to job-intensive manufacturing sector
- 2) issues of jobless growth in service sector.

Steps taken by government for inclusive growth -

1) Poverty alleviation programmes —

↳ PM - Gratib Kalyan Anna Yojana for free food grain to ~80 crore people

↳ Affordable Housing for poor

↳ PM - Awas Yojana

↳ DBT to farmers & vulnerable households

↳ PM - KISAN

3) Employment generation programmes

1) Revamping manufacturing sector

Make in India target → 25% GVA (present - 18%) by 2025

2) labor intensive sectors boost

↳ PLI for technical textiles,

cluster schemes for textiles & leather.

(iv) ITI industrial training & skill development through PM-KVY

However certain challenges —

1) Competition from cheap Chinese imports hurting manufacturing growth
2) High logistics cost & production cost.
3) (~14-16%) vs China - 7-8%.

3) Poor education outcomes due to low expenditure

eg India → 3.1% of GDP vs NEP 2020s 6%

4) Poor skill development & human capital formation (a) India skills report 2023 → ~5.1% grads are unemployable

India should boost PLI scheme with high capex and resilient infrastructure to boost manufacturing growth & promote inclusive growth.

012

Q.12) Discuss the significance of Multimodal Transport System in achieving last mile connectivity, improving logistics efficiency, and addressing the twin problems of pollution and congestion. What measures can be taken to ensure efficient multimodal transport connectivity in India?

(15 marks, 250 words)

India faces high logistic cost of (~14-16%) having spill-over effect in all industries and development issues.

Significance of Multimodal transport system in achieving last mile connectivity

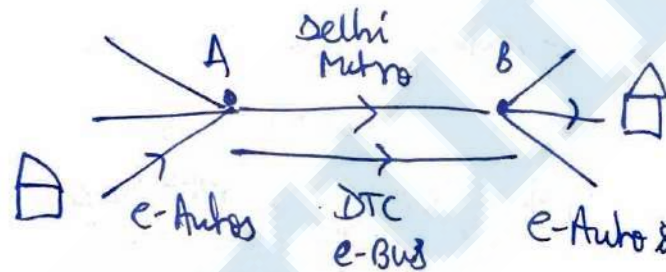


Fig: Delhi last mile connectivity model.

- 1) Promotion of Public Transport →
- ↳ lowering pollution (SO_x, NO_x, PM_{2.5} etc)
 - ↳ decongestion on overcrowded roads
 - eg No traffic jams
 - ↳ Green vehicles eg MORTH released Green Hydrogen Bus

2) Improving logistics efficiency

- ↳ allows development of efficient & weather-tolerant roads
- ↳ High accessibility & affordability with choices of transport.

Measures to ensure efficient multimodal transport connectivity —

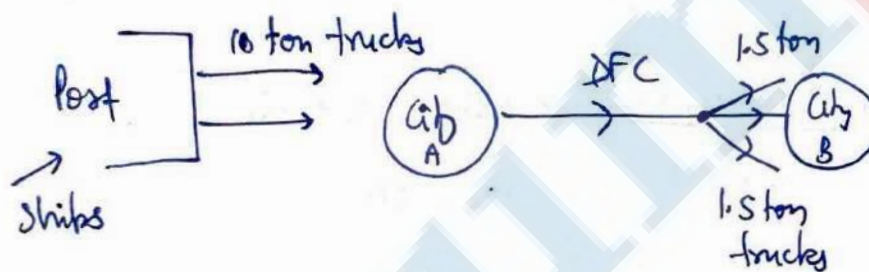


Fig: National Logistics Policy 2023

1) Master planning of cities to ensure last mile connectivity is deliverable

↳ Delhi Metro → multiple lines with wide coverage

2) Promotion of Green vehicles → Li-Ion batteries, EV, Green H₂ etc

↳ Toyota Mirai ← uses Green H₂

3) Mudging public for Public transport
Mission LFF

4) Promotion of manufacturing (~18% GVA) to
25% GVA

High quality trucks & train rolling
stock → low emissions

However certain challenges —

1) Brownfield issues → land acquisition causing
high cost & haphazard development

2) Cultural & social attitude → use of
personal vehicles for travel

3) Logistical challenges → Hub & spoke model

India should promote ^{public} transport friendly
cities and between inter city travel to
reduce logistics cost. (SDG-11)

Q-13

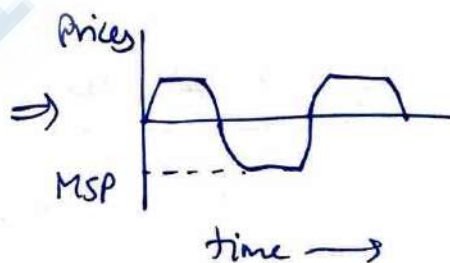
Q.13) Highlighting the rationale behind declaring MSP, discuss various issues related to the MSP regime in the country. Also, critically analyse the efficacy of legalizing MSP towards ensuring financial sustainability in farming.
(15 marks, 250 words)

Minimum Support Price (MSP) is provided to farmers in India as a direct form of subsidy. With $\sim 45\%$ people still engaged in agriculture, MSP acts as a stabilizer.

Rationale for MSP

1) Stabilises the prices of Agriculture commodities \rightarrow caps losses

eg Cobweb phenomenon



2) Support to farmers in case of downfall of prices eg MS Swaminathan \rightarrow A2 + FL Cost method

3)

Boosting Agriculture productivity

eg Target 6-7% growth present \rightarrow 4-5%

Issues related to MSP

- 1) Distortion of market mechanism → prices of commodities not based on demand & supply
- 2) Violation of WTO rules with Amber Box Subsidy
⊕ Buffer stocks, PDS issue.
- 3) inefficient process → sale of produce happens at farmgate itself, profits are booked by middlemen & Aashiyas.
- 4) high fiscal cost & opportunity cost
⊕ > 2 lakh crore food subsidy support.

Efficacy of legalising MSP towards financial sustainability -

- 1) Doubling of farmers income with better price discoveries ⊕ e-NAM portal
- 2) Relief to farmer's woes

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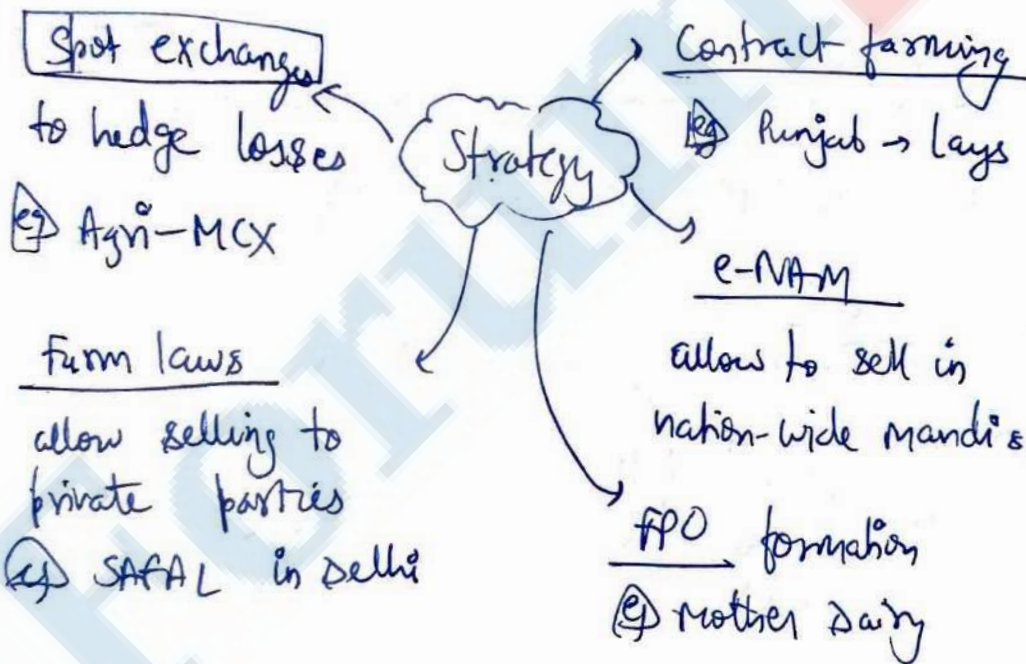
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उम्मीदवारों को इस हाशिए में नहीं लिखना चाहिए।
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3) Open-ended procurement policy

However it has plethora of negatives —

- 1) fiscal deficit will shoot up (FRBM limit - 3.1%)
- 2) WTO challenges (Amber Box) in implementation
- 3) Lack of storage infra → X cold chain
↳ ~18-20% Post harvest losses



MSP is a temporary solution which must be augmented with capex investment in Agri sector



0-17

Q.14) Food Processing Industries (FPIs) can act as a bridge between the informal farming community and the formal industrial sector, which can help boost the rural economy. Examine.

(15 marks, 250 words)

FPI is a sunrise sector with high rate of growth (12-13% CAGR) becoming high employment generation sector.

FPI can act as bridge between informal farming community & formal industrial sector —

➤ Establish forward & backward linkages

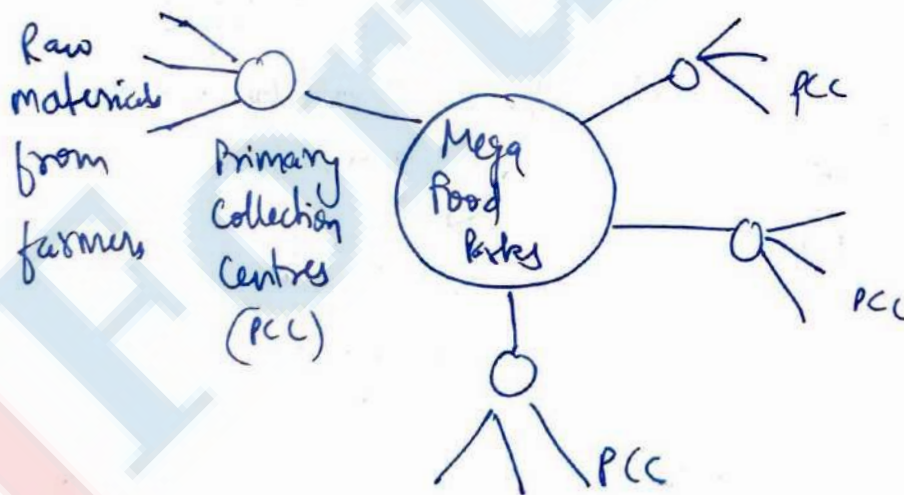


fig: Hub & Spoke model of FPI clusters.

2) Reduction of Post-harvest losses (~18-20%)

↳ Cold chain infra in PCC

3) Higher price discovery to farmers with pre-defined contracts

4) FPO's to support economies of scale

↳ Patanjali → sourcing from clusters of farmers

Boost to rural economy —

1) Employment Generation in secondary and tertiary processing of foods (~18 lakh job potential)

2) Doubling farmers income (~2000 ₹ / month) recommended by Shanku Kumar committee.

3) Burgeoning Urban demand

↳ demand for super foods (e.g. whey protein)

4) Increased shelf-life of produce → lower

post-harvest losses (e.g. mustard → mustard sauce)

(Please do not write anything except the question number in this space)
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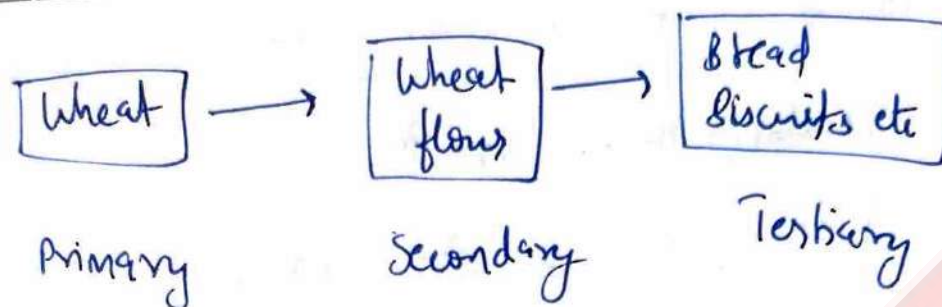


Fig : Stages of FPI

However certain challenges —

1) lack of capital availability.

↳ MFP requires high investment

2) poor R&D India → 0.7% of GDP
Us, China → 2-3% of GDP

3) Sanitary & Phyto sanitary issues

④ Pesticide residue

PLI scheme
in FPI sector

ODOP

Strategies

UV irradiation
for decontamination

FPI sector must be actively promoted to
double farmers income

Q-15

Q.15) Discuss the role of biotechnology in enhancing agricultural productivity. Also, highlight the concerns regarding the application of biotechnology in agriculture. (15 marks, 250 words)

Biotechnology refers to use of genetic engineering, Bio-engineering etc to obtain desired results. It has immense applications in various fields.

Role of Biotechnology in enhancing agricultural productivity —

I — Proc. — Harvest

1) Development of high quality seed varieties

eg DMH-11 mustard → 20-25 % increase in production

2) Increase output of farmers

eg BT-cotton → high supply of raw materials helped developing textile industries

3) Reducing import & Current Account deficit

eg GM-Rubber to reduce imports from Brazil.

2) Artificial Pollinators

II Post-Harvest

1) Food Fortification (eg) β -Carotene in Golden
for Nutritional security rice

2) Increased shelf life \rightarrow Genetic engineering
to reduce mushiness of fruits (eg) Indian
mangoes.

3) Stubble and waste-management for
sustainable farming

(eg) Pusa decomposer in Delhi-NCR

Concerns regarding application of Biotechnology
in Agriculture —

I- Regulatory Concerns

\hookrightarrow Approval from GEAC required with long
duration of trials

\hookrightarrow poor quality of records

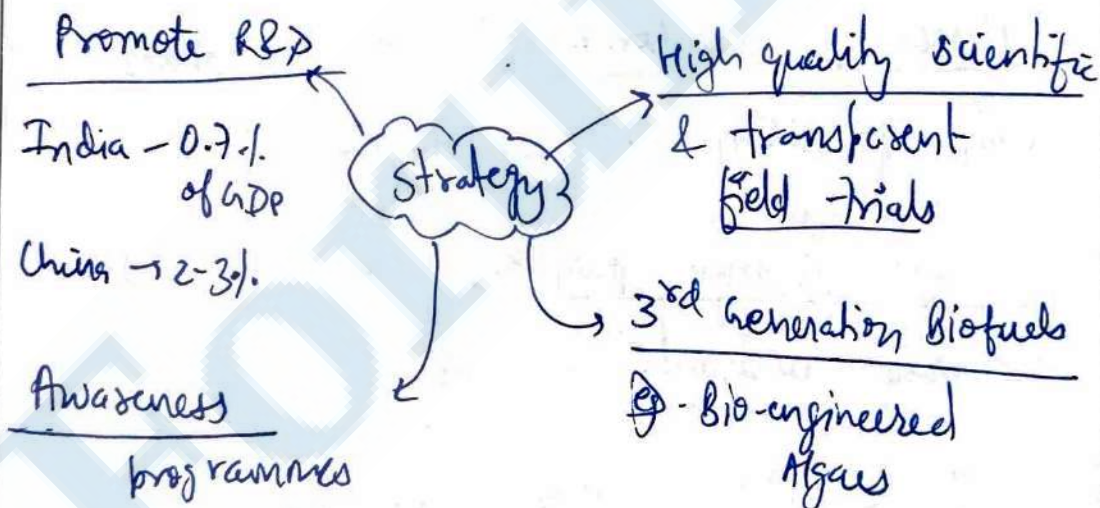
II - Scientific

- ↳ impact on pollinators & ecosystem
- ↳ threats of environmental ecosystem
- ↳ increased tolerance of pests

eg Bt cotton → Bollgard worm became resistant

III - Legal

- ↳ Supreme Court stayed Bt-brinjal due to concerns in genetic changes in food chain



Biotechnology is key to India's food security, Nutritional security & Energy security.

B-16

Q.16) 5G technology is a breakthrough that finds applications across diverse sectors. Elaborate. How is 5G technology different from its predecessor? Also, list the various challenges associated with its effective rollout. (15 marks, 250 words)

5G technology operates in narrow band
of spectrum providing speeds in
range 1Gbps to 20Gbps.

Breakthrough with applications in diverse sectors —

- 1) Research in communications & beam
array formation & beam forming.
- 2) General human purpose such as video
streaming without buffering
- 3) IoT & Smart homes augmenting
IR4.0 capabilities (eg) interconnected
devices.
- 4) Web3.0 & Metaverse applications
& Digital world

5) AR & VR applications reducing latency and lagginess

Difference of 5G from its predecessors —

5G

4G, 3G & earlier

— low latency rates
($\sim 3-4$ ms)

— high latency
($\sim 20-30$ ms)

— high speed 1 Gbps to 20 Gbps

— lower speeds
upto 1 Gbps

— narrow band of spectrum
→ low range

— higher range & coverage

— requires large no. of antennas

— requires lesser no. of antennas

Challenges with effective 5G rollout —

1) Technical challenges —

↳ Coverage issues → beamforming in lower freq. range → requires large no. of antennas.

2) Environmental impact → High frequency
radiation impacting humans & ecosystem
eg Confusion observed in migratory birds
(Nature article)

3) Equity issues → slow and negligible
rollout in hilly areas, rural etc
↳ Digital divide → requires 5G compatible
smartphones → high cost.

5G rollout must be made inclusive and
further research must be done to mitigate
its negative impacts on environment.

5G can help India reach \$1 Trillion

"Digital economy" by 2030

Q.17

Q.17) Discuss the repercussions on marine ecosystem and economy resulting from the combined effects of ocean acidification, ocean warming, and oxygen loss. (15 marks, 250 words)

Marine Biodiversity is facing unprecedented threat of extinction with exacerbating impacts of climate change & anthropogenic activities.

Ocean Acidification



Increases concⁿ of H⁺ ions in ocean ↑ Acidity (low pH levels)

Ocean Warming



raises temperature by 2-3°C
⇒ Marine Heat Waves

Oxygen loss



reduces dissolved oxygen & ↑ BOD

Combined effect on marine ecosystem —

1) Bleaching of coral reefs → expels zooxanthellae breaking symbiotic relationship

⇒ Great Barrier reef in 2021

2) Eutrophication & Algal Bloom due to nutrient enrichment.

- 3) loss of Biodiversity → 2 species is critically endangered in India
- 4) collapse of Oceanic food chain with decline of Phytoplankton
- 5) Carbon Cycle disturbed → ↑ GHG emissions & climate change

Repercussions on economy -

- 1) loss of Ecosystem services
 - ↳ Regulating environment → Carbon cycle
 - ↳ Provisioning of foods → Shrimps
 - ↳ Aesthetics → tourism

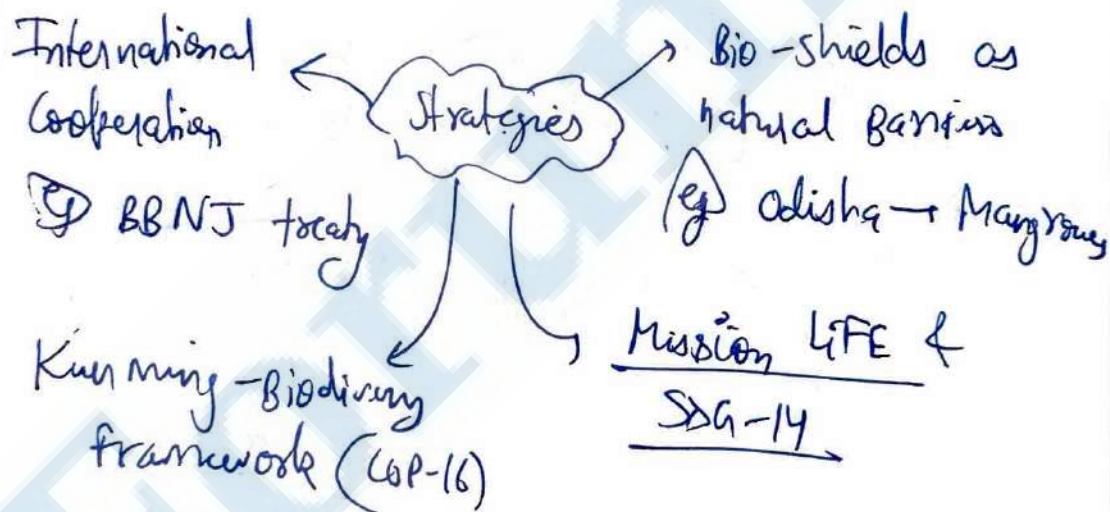
- 2) loss of Coastal ecosystem & fisheries
 - ↳ Increased Coastal erosion → Kuala
 - ↳ submergence of coastal cities and SIDS → Maldives
 - ↳ loss of livelihoods → fisherfolk

with depleting fish stocks.

3) Tourism potential losses

⇒ \$ 10-12 Bn losses of tourism industry in Coral reefs alone

4) decline of Agriculture productivity
↳ low marine exports → mackerel, tuna etc

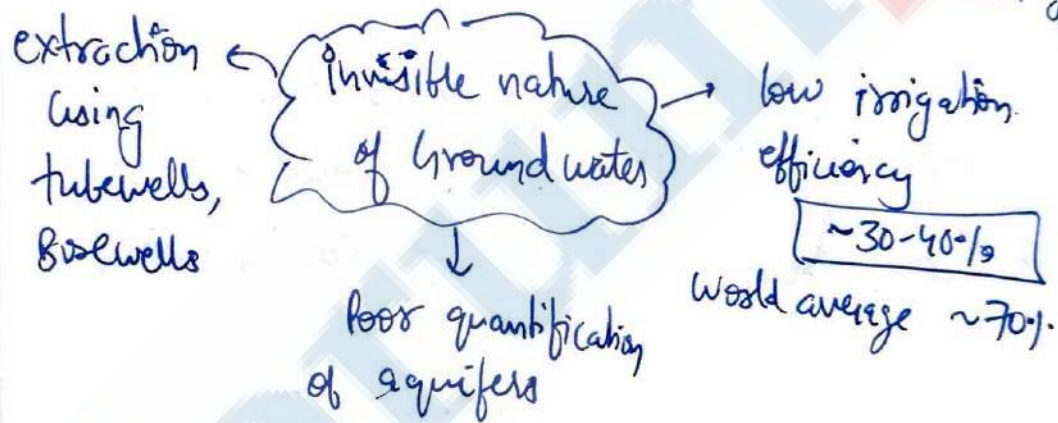


India should implement and support Marine Protected Areas (MPAs) in concert with international community for SDG-14.

8-18

Q.18) The invisible nature of groundwater is a major obstacle in the path towards achieving the twin objectives of building climate resilience and meeting the Sustainable Development Goals (SDGs). Elucidate. (15 marks, 250 words)

India extracts $\boxed{\sim 25\%}$ of world's ground-water resources with $\boxed{> 80\%}$ being utilised for irrigation purposes. India is facing "worst water crisis" in history (CWMI)
NITI Aayog



Obstacle in building climate resilience

- 1) high irrigation subsidies in Agriculture
 - (a) free electricity to farmers
- 2) over irrigation leading to soil salinity etc
 - (a) Punjab & Haryana \Rightarrow degradation of soil

3) Contaminating of groundwater resources

eg Industrial emissions → Arsenic & Fluoride

↳ Pesticides & fertilisers runoffs

eg urea & DAP

Obstacle in making SDG's —

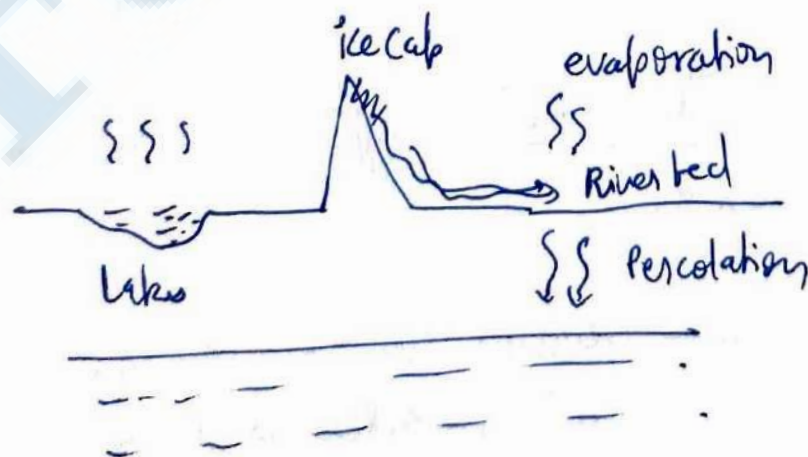
1) lack of water supply adequately in cities

eg SDG-11 requires regular tap supply

2) ineffective measures in tackling climate

change eg SDG-13 Climate change requires mindful & deliberate use.

3) Hydrological cycle is disturbed



Page
Fig: Water cycle

Strategies to ensure climate resilience and SDG goals tackling invisible nature of Groundwaters —

1) efficient water supply infra

↳ water Bills & charges for responsible use (eg Delhi)

↳ tap supply equity (eg JJM) → $\frac{55L/day}{person}$

2) irrigation strategies

▷ drip irrigation → "per drop, more crop"

▷ shift to natural farming ← Bijamir & Jeerami
[Sukesh Palekar]

3) "Catch the Rain" campaigns & watershed management.

India must revive its traditional water management resources such as johads, tanks etc.

Q-19

Q.19) Despite various efforts, a lasting solution to the insurgency in the north-eastern region of India remains elusive. Analyse the reasons behind the continuation of insurgency in the region. Also, suggest effective measures to tackle it. (15 marks, 250 words)

North-East region of India faces frequent insurgency and armed struggle affecting 3.78% of Country's population (census 2011).

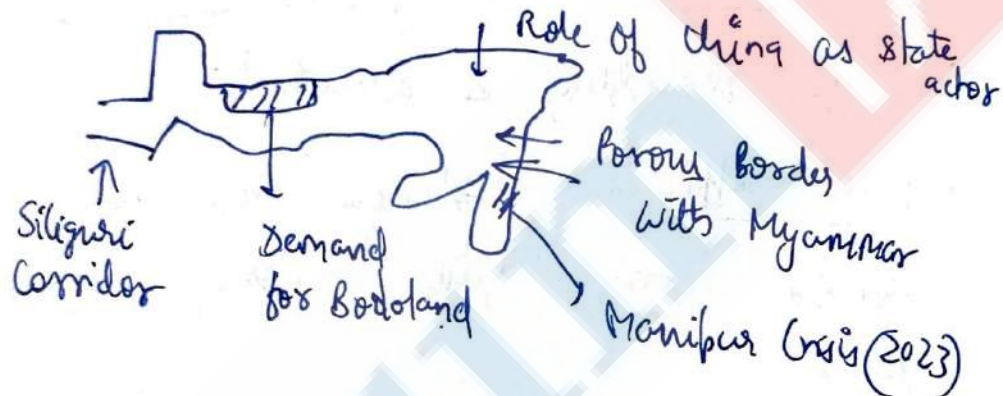


Fig: North East India

Reasons behind continuation of insurgency in NE India —

- 1) Development deficit → lack of proper educational & health facilities
eg high dependency on Union funds
- 2) Governance deficit → poor sensitivity &

corruption in administration

3) Role of State Actors → China & Pak

④ Porosh Banah of MSCN (FM) → refuge by
China
↳ arms & weapons supply

5) Narcotics issue → nearby Golden triangle

↳ Drug smuggling & addiction

5) Human trafficking → illegal migrants

- Kuki Zo from Myanmar, Rohingyas from
Bangladesh.

6) Secessionist tendencies for regional
imbalance and failure of Indian state.

Effective measures —

1) "Whole of government" approach →

convergence of all schemes for holistic
development.

eg DoNER department &
ministry

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- 2) Intelligence gathering & cooperation → Community policing & community engagement.
- 3) Autonomy of Tribal Areas
 eg Cachar ; Karbi-Anglong region
- 4) Regulatory measures → special ASFPA in peaceful regions (Law commission)
- 5) Winning Hearts & minds approach with social Capital development.
- 6) "Bullet for Bullet" approach for hardcore extremists eg ITBP

India must leverage "Act East" policy for infrastructure development (Roads, telecom) and connectivity projects (Kaladan & IMT trilateral highway) implementing Bezbaruch Committee recommendations.

(Please do not write anything except the question number in this space)
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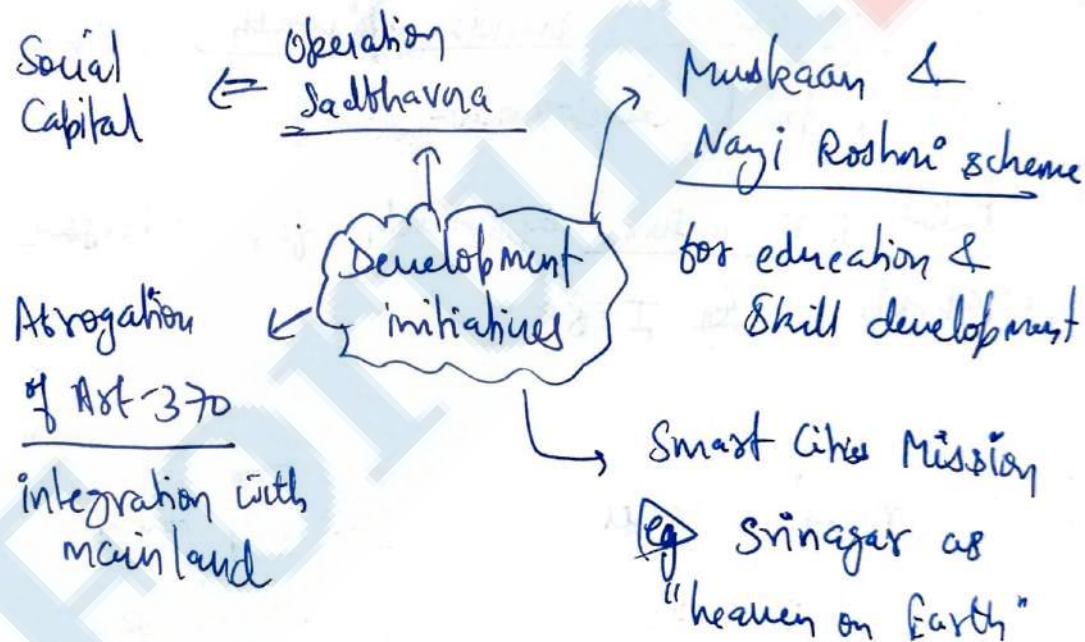
Q.20

Q.20) While developmental initiatives have a significant role to play, they alone cannot root out terrorism/militancy in Jammu and Kashmir. Comment. (15 marks, 250 words)

"Kashmir cannot be won with power of sword but with power of love"

— Kalhana (Rajtarangini)

Jammu & Kashmir has faced militancy & cross-border terrorism since independence.



Development initiatives lacking in rooting out militancy & terrorism —

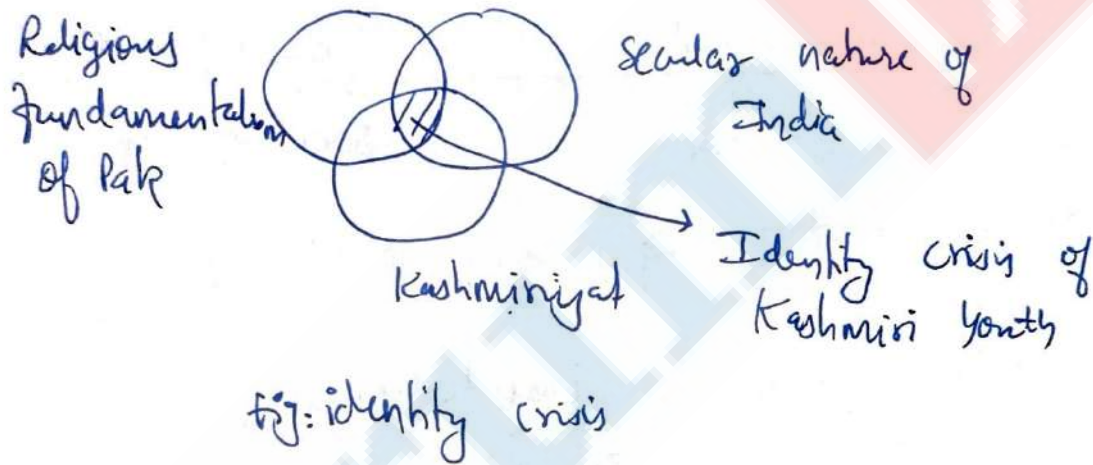
➤ Role of State actors → Pakistan

1) terrorist launchpads on other side of LOC.

2) Role of non-state actors → Harkat-ul-Mujahideen, Al-Qaeda etc

3) Radicalisation & spread of extremism

eg) Islamic fundamentalism



4) Cross-Border insurgency and infiltration

↳ technical issues in Border monitoring due to tough terrain

5) Crisis of legitimacy of Indian state in Kashmir Valley.

↳ lack of local support for intelligence

Strategies to effectively root out militancy

1) coupling "winning hearts & minds"
approach with "Bullet for Bullet" approach

↳ reformation of willing militants &
elimination of radical hardness.

2) establishing Indian states as legitimate
agent of development & socio-economic
transformation
↳ Boosting Tourism potential

3) Border fencing → laser techniques, drone
monitoring, BOLD - QIT

4) Education & Skill development
↳ PM-KVY

Recent theatrical shift of militancy from
Kashmir to Jammu signals tactical shift
which must be thwarted with increased
troop mobilisation & local support.

Mentor Feedback Questions

- Should I focus on handwriting more?
- 1
- What can I do for better presentation?
- 2
- 3
- 4
- 5

Test Goal

- 1 ☐
- 2 ☐
- 3 ☐

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
20 Marker	7.75 – 10	6 – 7.5	< 6
✓✓	Key / Relevant Point		
✗	Vague / Irrelevant		

* Subject to change without prior notice.