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GENERAL STUDIES (TEST CODE : 1419)

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Medium Eng./Hindi	ENGLISH	Registration Number	32997
Center	ONLINE	Date	12/01/2020

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	10	
2	10	
3	10	
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11	15	
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15	15	
16	15	
17	15	
18	15	
19	15	
20	15	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

- 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)।
- There are **TWENTY** questions printed in **ENGLISH & HINDI** इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
- All questions are compulsory.**
सभी प्रश्न अनिवार्य हैं।
- The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
- 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।
- Word limit in questions, if specified, should be adhered to.
प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
- 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।

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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. Highlighting the issues associated with power discoms in India, discuss whether privatizing discoms can help in this regard. — (150 words) 10

भारत में विद्युत वितरण कंपनियों (डिस्कॉम्स) से जुड़े मुद्दों पर प्रकाश डालते हुए, चर्चा कीजिए कि क्या डिस्कॉम्स के निजीकरण से इस संबंध में महायता मिल सकती है।

Power discoms are tasked with distribution of power procured from generators to the consumers.

ISSUES OF DISCOMS

- ① Heavy losses: DISCOM debt is estimated to be nearly 3 lakh crore
- ② Aggregate technical and commercial losses (ATCL): are estimated to be north of 20%
- ③ low capacity utilization
- ④ Cross subsidization: leading to switching of industrial users to alternate means of energy

⑤ Lack of scientific metering

Privatising Discoms

Arguments in favour

- Delhi privatized DISCOMs reduced losses from 56% to 8%.
- It may bring better expertise and management
- Reduce ^{fiscal} burden on government
- May boost private investment

Arguments against

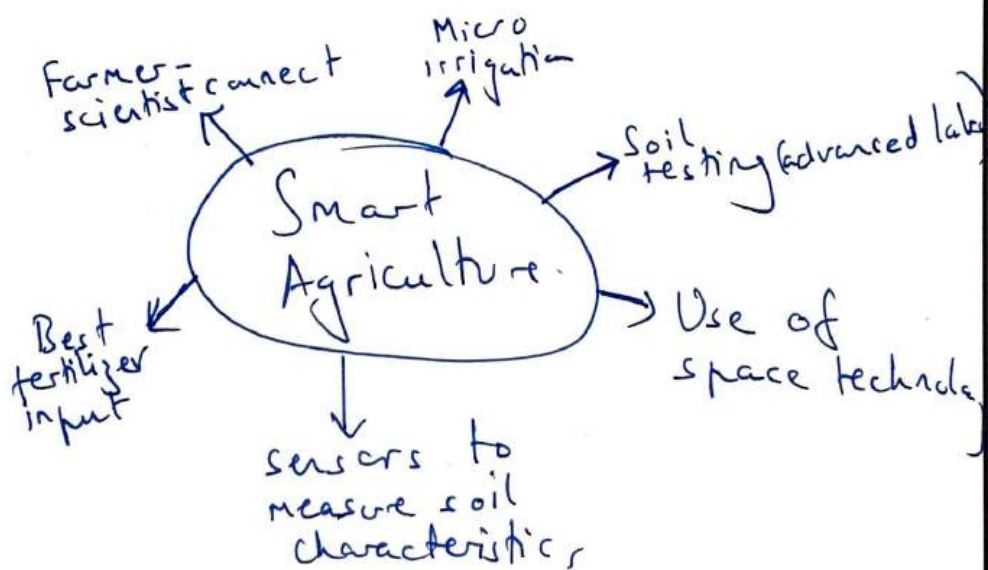
- Tariffs may be hiked beyond reach of poor
- Private buyers may not be interested in loss making DISCOM
- Privatization does not guarantee efficiency

Therefore privatization of DISCOMs could be carried out in phased manner where the losses are unsustainable. An adequate regulatory regime must accompany to uphold consumer interest.

2. Harnessing Smart Agriculture can potentially be a game-changer for farm productivity in India. Discuss. (150 words) 10

स्मार्ट कृषि का दोहन संभवतः भारत में कृषि उत्पादकता के लिए निर्णायक सिद्ध हो सकता है। चर्चा कीजिए।

Smart agriculture is a paradigm which relies on sustainable use of inputs to get desired yield along with usage of technology to optimize the process.



Game changer for farm Productivity

→ Precision irrigation : According to Dalwai committee micro irrigation can boost productivity by 40%.

- Soil health: Can be improved by measured application of fertilizer/pesticide
- GIS mapping: for best soil for particular crops
- Weather satellites: such as INSAT 3D for rainfall modelling
- Soil sensors: To give input of microbes activities for ~~ided~~ crop growth
- Farm-scientist connect: For development of hybrid varieties.

Thus smart agriculture can play a driving role in doubling farm income.

3. Rather than focusing solely on quantity, inclusive growth concerns itself with the quality of growth. Discuss. (150 words) 10

केवल परिमाण पर ध्यान केंद्रित करने के बजाय समावेशी विकास, संवृद्धि की गुणवत्ता के साथ भी अपना सरोकार रखता है। चर्चा कीजिए।

Inclusive growth is a concept that aims to create opportunities for all and distribute the dividends equitably across sections

NOT ONLY QUANTITY BUT
CONCERNS WITH QUALITY

→ Human capital : Building of health and education profile of different strata is a key goal

→ Sustainable growth : Aim is to minimize the adverse effects on environment Eg emphasis on circular economy.

→ Regional equity : It strives to not merely improve growth of financial hubs but also of remote and poverty stricken areas (Eg. Tharkhand recorded fastest reduction of poverty 2005-16 period)

→ Growth resulting in structural transformation : With generation of sufficient employment in labour intensive areas

→ Growth to improve social capital

By being inclusive of all communities and reduce social strife

4. In the backdrop of Atmanirbhar Bharat, discuss the core areas crucial in export promotion for India to become a manufacturing hub.

(150 words) 10

आत्मनिर्भर भारत की पृष्ठभूमि में, भारत के लिए एक विनिर्माण केंद्र बनने हेतु निर्यात संवर्धन में महत्वपूर्ण मुख्य क्षेत्रों (कोर एरिया) की विवेचना कीजिए।

Atmanirbhar Bharat is
a flagship program of government
launched ~~in the~~ to rebuild the
economy for post covid world

5 pillars

- ↳ Economy
- ↳ Demography
- ↳ Demand
- ↳ Infrastructure
- ↳ System

CORE AREAS CRUCIAL

• Pharmaceutical

Currently 70% API imports from
China. Though India largest drug

manufacturer can become self-reliant
via Bulk drug park, PLI scheme
Electronics

India heavily dependent on
semiconductors import. The PLI
scheme and Manufacturing clusters
can help boost production

Textile

With China vacating space and
India having traditional expertise
can exploit opportunity

Automobile

With the already growing domestic
market, Atmanirbhar Bharat can
help boost domestic production

Defence

India ~~is~~ is the 2nd largest
importer in the world. Atma Nirbhar
approach can help achieve reliance
in ~~non-critical~~ this area

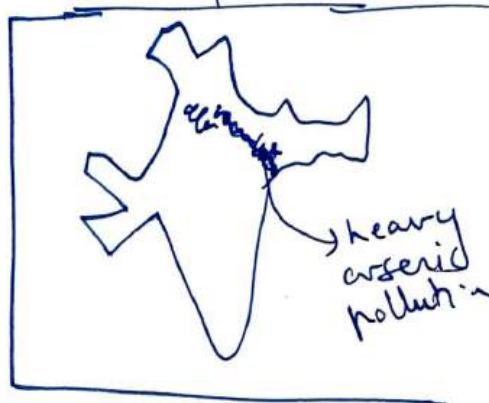
5. Arsenic pollution is becoming a severe environmental issue in India. Enumerating its various sources, discuss the consequences and measures to tackle it. (150 words) 10

आर्सेनिक प्रदूषण भारत में एक गंभीर पर्यावरणीय मुद्दा बनता जा रहा है। इसके विभिन्न स्रोतों को सूचीबद्ध करते हुए, इसके परिणामों और इससे निपटने के उपायों पर चर्चा कीजिए।

Arsenic is a heavy metal that has become an environmental menace due to its non-degradable nature and ~~the~~ toxic effects.

Sources

- Excess ground water exploitation



- Paddy cultivation Fig : Areas of arsenic also causes arsenic due to stubble burning

- Mining operations in mineral rich areas

- Leather industries

- E-waste
- ### Consequences

- Black foot disease

- Nervous system disorders
- Brain damage
- Stunting of children

Solutions to tackle

→ Removal via precipitation,
adsorption, filtration

→ Reducing groundwater
exploitation

→ Zoning of contaminated
areas

→ Investment in research
and development

Tackling arsenic pollution
can significantly reduce the disease
burden amongst the vulnerable
populations (esp. Bengali plain)

6. The Green Term Ahead Market (GTAM) can invigorate the renewable energy sector in India. Evaluate. (150 words) 10

ग्रीन टर्म अहेड मार्केट (GTAM) भारत में नवीकरणीय ऊर्जा क्षेत्र को सुदृढ़ बना सकता है।
मूल्यांकन कीजिए।

Green Term Ahead Market
is a market opened for trading
of short term renewable energy

Features

- short term energy agreements
 - would be counted under Renewable purchase obligation
 - Can be traded throughout the day
 - Classified into solar and non-solar
- Can reinvigorate the sector

- ① Reduce dependence on long term PPAs
- ② Help boost investment in renewable energy sector.

- ③ Help DISCOMs meet their RPO targets
- ④ Flexibility in meeting power targets $\Rightarrow$ better forecasting of demand
- ⑤ Gives boost to Energy trade market
- ⑥ Help achieve Paris goal of 40% renewable energy

Thus GTAM is a policy decision in the right direction helping both the sector as well as national objectives under Paris goals and SDG #7

7. In context of the increasing importance of technology for disaster management, throw some light on the application of GIS and Remote Sensing in disaster management with specific examples from India.

(150 words) 10

आपदा प्रबंधन के लिए प्रौद्योगिकी के बढ़ते महत्व के संदर्भ में, भारत से विशिष्ट उदाहरणों को प्रस्तुत करते हुए आपदा प्रबंधन में जी.आई.एम. और सुदूर संवेदन के अनुप्रयोग पर कुछ प्रकाश डालिए।

According to UNISDR
India loses 10 billion \$ annually
to disasters. These disasters pose
a grave concern and in this
context technology can play
vital role



GIS Mapping

- Mapping of vulnerable areas to floods, landslides, earthquakes
- Help in hazard zonation by grading according to threat

- Coastal areas and river beds can be monitored for sand smuggling thus reduce flood risk

Remote Sensing

- Help reduce forest fire by tracking fire eg NASA Modis
- Satellites such as INSAT 3D and 3DR help track cyclones etc
- Help detect geological faults to predict vulnerable areas
- Ice/glacier movements to help chart glacial lake outburst, landslides etc

Thus GIS and remote sensing are integral component of efficient disaster mitigation paradigm

8. The CRISPR/Cas9 genetic scissors have revolutionized the genome editing technique with applications in various areas. Discuss. (150 words) 10
क्रिस्पर/कैस9 (CRISPR/Cas9) आनुवंशिक कैंची द्वारा विभिन्न क्षेत्रों में अनुप्रयोगों के साथ जीनोम संपादन तकनीक में क्रांतिकारी परिवर्तन का संचार किया गया है। चर्चा कीजिए।

CRISPR/Cas 9 is a technique to detect and replace any desired segment of a genome

CRISPR : To identify the targeted gene sequence

Cas 9 : Enzyme to cut the sequence

Applications in Various Areas

→ Disease cure : By targeting the defective sequence and replacing it with functioning whole

→ High yield variety seeds :
Which have disease resistance and higher productivity

→ Transgenic cattle : With mixing of genes to give higher yield

→ Medicine creation : By culturing bacteria with unique gene sequence suited for disease

Issues

→ Chinese scientist used CRISPR technology to create gene edited babies 'Lulu' and 'Nana' and was punished for violating norms

→ Germline editing may impair future generations

→ Man playing role of god
(Ethical issues)

CRISPR-Cas9 has immense potential to benefit humanity. However in present context it should not be used for germline editing and be

9. Bring out the role played by Financial Action Task Force in tackling the menace of money laundering. (150 words) 10

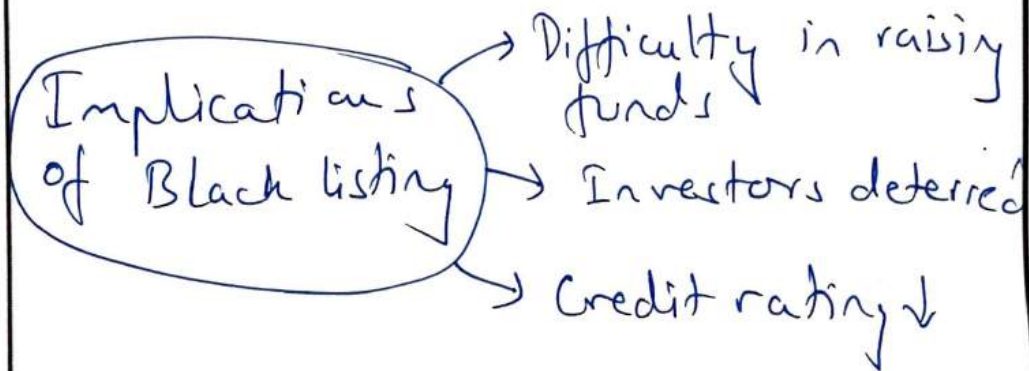
धन-शोधन के खतरे से निपटने में वित्तीय कार्रवाई कार्य बल द्वारा निभाई गई भूमिका को स्पष्ट कीजिए।

FATF is an intergovernmental body that was created in 1989 by G-7 countries to tackle money laundering. It has 35 countries as its members.

Role Played

- Setting agenda and rules for tackling money laundering
- Creating model laws for guiding nation's money laundering legislation
- Cracklisting members : Which are of concern and suspected to have large scale laundering /

terror financing. Eg Pakistan
 → Blacklisting Countries : ~~Why~~
 Which are non compliant and
 deficient in enforcement
Eg Iran, north Korea



FATF has been successful
 in creating a deterrent regime
 against terror financing. It was
 evident in recent gray listing
 of Pakistan which was forced
 to take coercive measures against
 organisations like Jem, LeT etc.

10. Discuss the recent reforms that have been undertaken in the National Security Architecture of India. (150 words) 10
भारत की राष्ट्रीय सुरक्षा संरचना में हाल ही में किए गए सुधारों की विवेचना कीजिए।

Indian National Security Architecture has witnessed several transformative changes to help rationalize roles and order chain of command

→ Defence Planning Committee
Established under NSA with 4 sub committees for defence diplomacy, defence capability, defence manufacturing and defence policy

→ Chief of defence staff
Was created to promote jointness amongst the 3 services and help craft integrated policies and

doctrines. He is also secretary of department of military affairs

- Tri Service Command

Established at Andaman and Nicobar island

- 3 Triservice agencies

↳ Defence Cyber Agency

↳ Armed forces special operations division (including MARCOS, GARUD commandos)

↳ Defence Space Agency

11. Bring out the key hurdles that are being faced in accomplishing land reforms in India. Also, discuss the advantages which can be reaped by accomplishing them in contemporary times. (250 words) 15

भारत में भूमि सुधारों को पूरा करने में सामना की जा रही प्रमुख बाधाओं को स्पष्ट कीजिए। साथ ही, समकालीन समय में इन्हें पूरा करने से होने वाले लाभों की भी विवेचना कीजिए।

Newly independent India embarked on land reforms as a major policy decision to reform the inequitable agrarian structure.

These proceeded in 4 phases:

- ① Zamindari abolition
- ② Tenancy reform
- ③ Land ceilings
- ④ Cooperativization

However these reforms have failed to bring about the desired effect and agriculture still is overpopulated and undergrowing.

REASONS FOR FAILING TO ACHIEVE LAND REFORMS

- ① land record discrepancies: land titles are often unclear and have

disputes by multiple claimants

② Subterfuge layers : Offer multiple layers of intermediaries involved

③ Non uniform record keeping

④ Lack of infrastructure especially in gram panchayats and other local bodies

⑤ Fragmented landholding : Current average landholding is 1.08 ha (Agri census 2015)

⑥ Failure of previous attempts of cooperatives : Thus farmers are still reluctant to pool land

⑦ Legal difficulties : Land acquisition and rehabilitation act 2013 requires consensus of 80% of farmholders to divert their land making it difficult

⑧ Space technologies : Are still underutilized to map land

Advantages that can be reaped

Social

- Address burgeoning agrarian inequality (86% small and marginal farmer)
- Address distress migration from rural to urban
- Help check increasing unemployment
- Reduce reservation demand and social unrest

Economic

- Allow for economies of scale
- Increase private investment
- hard banks etc would help ease of doing business
- Promote rural economy and balanced regional development

STEPS TAKEN

- hard record modernization Progr.
- hard bank
- Swamitva scheme
- Promoting FPO

Thus new wave of land reforms

12. India needs to accord more significance to nutritional security than food security. Comment. In this context, suggest a framework that should be adopted by the government to achieve nutritional self-reliance.

(250 words) 15

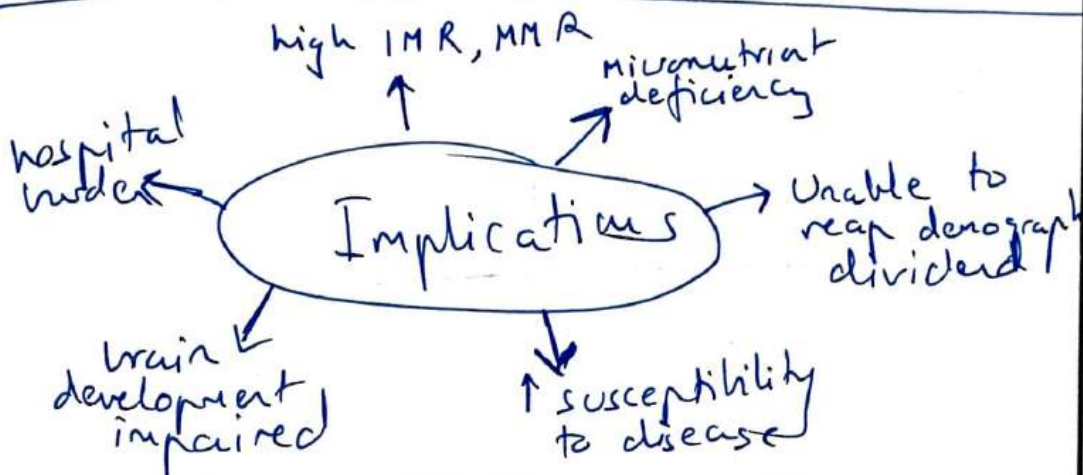
भारत को खाद्य सुरक्षा की तुलना में पोषण सुरक्षा को अधिक महत्व देने की आवश्यकता है। टिप्पणी कीजिए। इस संदर्भ में, वह रूपरेखा भी बताइए जिसे सरकार द्वारा पोषण संबंधी आत्मनिर्भरता प्राप्त करने के लिए अपनाया जाना चाहिए।

Post independence the focus has been on achieving food security. This has resulted in green revolution and consequently India has increased its ^{several} food production from 22 MT (1950) to 285 MT (2019) and becoming food surplus country.

However India needs to focus on nutritional security as:

- 14% of population is undernourished (Global Hunger Index)
- ~~Rare~~ 38% under 5 children are stunted (NFHS-4)
- India ranked lowly 94th in Global Hunger Index

→ Further India is also facing increasing burden of ~~over~~ obese population (>10%)



FRAMEWORK FOR NUTRITIONAL SELF RELIANCE

Agriculture

- Focus on crop diversification (eg millets, pulses, oilseeds)
- Promote biofortification and standard fortification
- Promote horticulture and mixed farming

Public Distribution

- Decentralized procurement

and distribution at block level itself

→ Mid day meal to extend till class 12 and use local foodgrain

→ PDS to diversify its stock by including coarse cereals

Legal / Administrative

→ Dashboarding tracking of key indicators of priority districts (Eg Aspirational districts)

→ Policies to disincentivize over production of rice/wheat

→ FSSAI to monitor adulteration by increasing number of labs

Societal

→ Increasing the age of marriage

→ Improved sanitation habits

→ Dietary habits change

→ More fitness on outdoor physical work (eg Yoga)

Thus a comprehensive approach required to achieve nutritional

13. Private investments are key for India to move into a high growth trajectory. Discuss. Also highlight the steps taken by the government in recent times to address the fall in private investments. (250 words) 15

निजी निवेश भारत के लिए उच्च संवृद्धि पथ पर आगे बढ़ने हेतु महत्वपूर्ण हैं। चर्चा कीजिए। साथ ही, निजी निवेश में गिरावट को दूर करने के लिए हाल के दिनों में सरकार द्वारा उठाए गए कदमों को भी रेखांकित कीजिए।

Economic survey 2019 highlight
how private investment is the
key driver which ushers in
a 'virtuous cycle' of growth

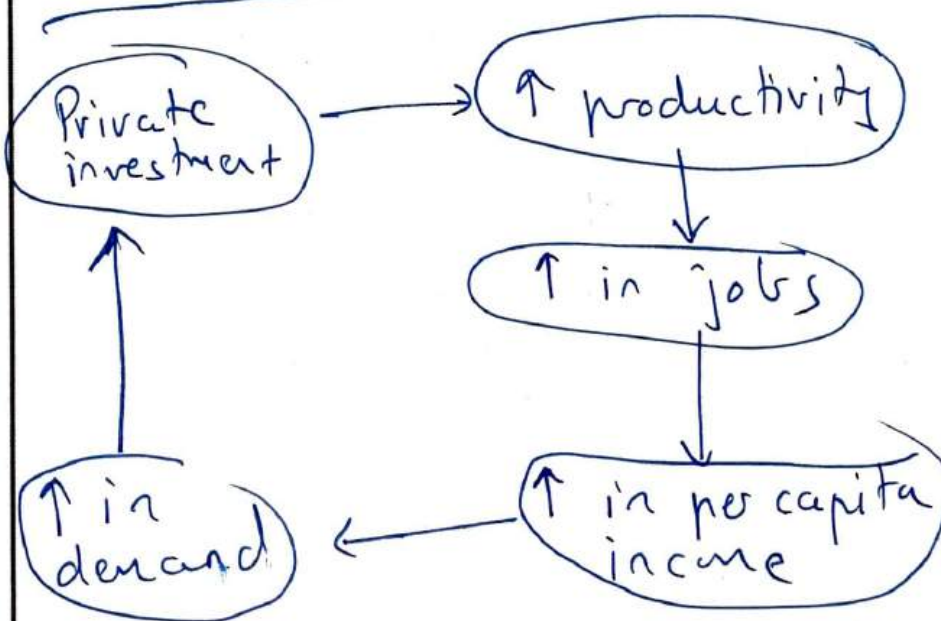


Fig: Virtuous cycle of growth

Private investment importance

→ Increases capacity: It improves the manufacturing capacity and output

- Creates jobs : Currently facing 45 years high unemployment (PLPs)
- Crowds in investment : It has positive effect on overall business environment
- Boosts export : Helps improve balance of payment
- Generates taxes : Which can be used by government for welfare
- Regional development : Via spillover effect and growth of secondary industry
- Impetus to research : By encouraging universities helps increase scientific temper.

STEPS TAKEN BY GOVERNMENT

- Credit : Eased the norms of

- External commercial borrowing
- Bond market : Given impetus via Masala bond / Elephant bonds
 - Faster clearance : By mechanisms such as eBiz portal, SPICE+, Empowered group of secretaries,
 - Faster exit : via Insolvency Bankruptcy code
 - FDI Liberalized : Across sectors with automatic route
 - FTAs : Signed with countries like Japan, South Korea, Singapore etc
 - Public investment : In form of National Infrastructure pipeline to complement and generate demand
 - Revised PPP MCA

Thus private investment is critical in achieving \$ trillion economy and renewed push needs

14. India's geographical diversity and varied levels of development across regions necessitate a targeted region specific action plan to ensure a minimum acceptable level of prosperity. Elaborate. (250 words) 15

भारत की भौगोलिक विविधता और विभिन्न क्षेत्रों में विकास के भिन्न-भिन्न स्तर समृद्धि के एक न्यूनतम स्वीकार्य स्तर को सुनिश्चित करने के लिए एक लक्षित क्षेत्र विशिष्ट कार्य योजना को आवश्यक बनाते हैं। सविस्तार वर्णन कीजिए।

15. Empowering the farmers by ensuring barrier-free trade in the agriculture produce is critical in doubling their incomes. Enumerating the existing bottlenecks, discuss how the recent legislations can help in overcoming them.

(250 words) 15

कृषि उपज का निर्बाध व्यापार सुनिश्चित करके किसानों का सशक्तीकरण करना उनकी आय दोगुनी करने में महत्वपूर्ण है। वर्तमान बाधाओं का उल्लेख करते हुए, चर्चा कीजिए कि इन पर नियंत्रण पाने में हालिया अधिनियम कैसे सहायता कर सकते हैं।

Indian government has set an ambitious target of doubling the farmers income by 2024 and in achieving it marketing of agri produce will play most critical role.

EXISTING BOTTLENECKS

① Too many intermediaries : It is estimated that farmers receive only 15-20% of final price.

② APMC issues

↳ High entry barriers as only certified government entities can open

↳ fragmentation of market into numerous mandis

↳ High charges : upto 8-10% in states like Punjab

- ④ Essential commodity act: Was frequently invoked which prevented investment in storage infra
- ⑤ lack of contract farming development thus low remuneration due to lack of economies of scale
- ⑥ Poor inter state trade due to Lack of last mile transport availability

RECENT LEGISLATIONS AND IMPACT

MEASURE	IMPACT
① Farm Produce Trade and Commerce (Promotion and Facilitation) Act 2020 → Allows any entity to open market anywhere → Abolishes levies on such entities	→ Helps realize one nation one market → Help reduce the intermediaries → Reduce artificial levies thus ↳ improve FCI finances ↳ fair price to farmer

Issues: → Dual structure of mandi
→ Asymmetry in favour of mandi operator
→ Decline in state revenue

② Farmer (Empowerment and Protection) assurance of farm supplies act
→ legalize farm contract regime
→ Dispute resolution process
→ Contract for upto 5 years

→ Help realize economies of scale
→ May boost private investment in agri
→ Help increase food processing industry

Issues: → Farm contract can be oral (may be misused)
→ Farmers fragmented lack bargaining power

Essential Commodities amendment act

→ brings out cereals, pulses etc

→ May boost investment in warehousing
→ reduce artificial price distortions

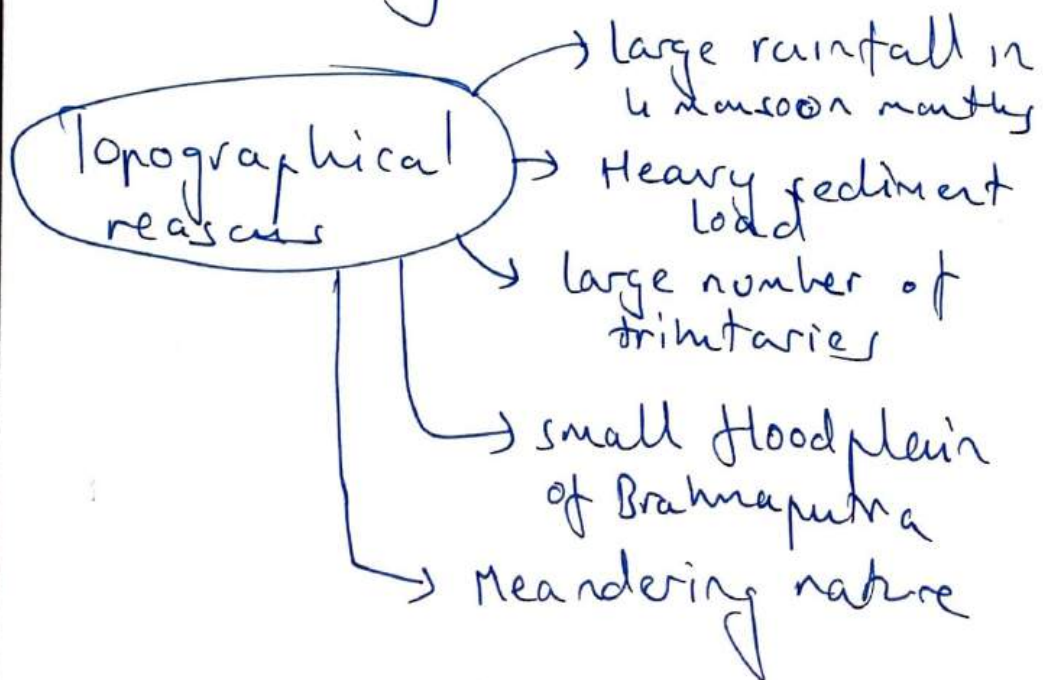
Thus these legislations can play a major role in doubling farm income however to realize these:

→ farmers should be collectivized under FPO to ↑ bargaining capacity
→ Productivity of farmer has to increase

16. The reasons for recurring floods in the regions of Eastern India such as Bihar and Assam go far beyond their topography. Discuss. Also, suggest measures to control this menace. (250 words) 15

बिहार और असम जैसे पूर्वी भारत के क्षेत्रों में बार-बार आने वाली बाढ़ के लिए केवल उनकी स्थलाकृति उत्तरदायी नहीं हैं। चर्चा कीजिए। साथ ही, इस खतरे को नियंत्रण में लाने के उपायों का भी सुझाव दीजिए।

Bihar and Assam see annual floods primarily due to flooding in the riverbanks of Ganga/Kosi and Brahmaputra respectively:



BEYOND TOPOGRAPHY

- Encroachment of floodplain
It impairs the ability of

Lakes etc to control flood

- Poor embankments: The embankment are not resilient and sometimes lead to more flooding
- Wetland destruction
- Unsustainable urbanization in the flood plain region blocks natural course
- Poor weather forecasting: Prevent sufficiently early warning for evacuation
- Inter department and Interstate coordination: Hampers execution of projects and flood response
- Failure of Inter river boards to find a lasting solution

MEASURES TO CONTROL

- ① Resilient embankments: By incorporating traditional knowledge

- (Eg Bamboo embankments of Assam)
- ② Early warning system need to be upgraded by using dynamic models with multiple variables
 - ③ Brahmaputra river Board needs to be restructured and empowered
 - ④ Flood plain zoning to help map vulnerable areas
 - ⑤ Removal of vulnerable structures
 - ⑥ Wetland development along the plains to help shield impact
 - ⑦ Dredging/desilting wherever feasible

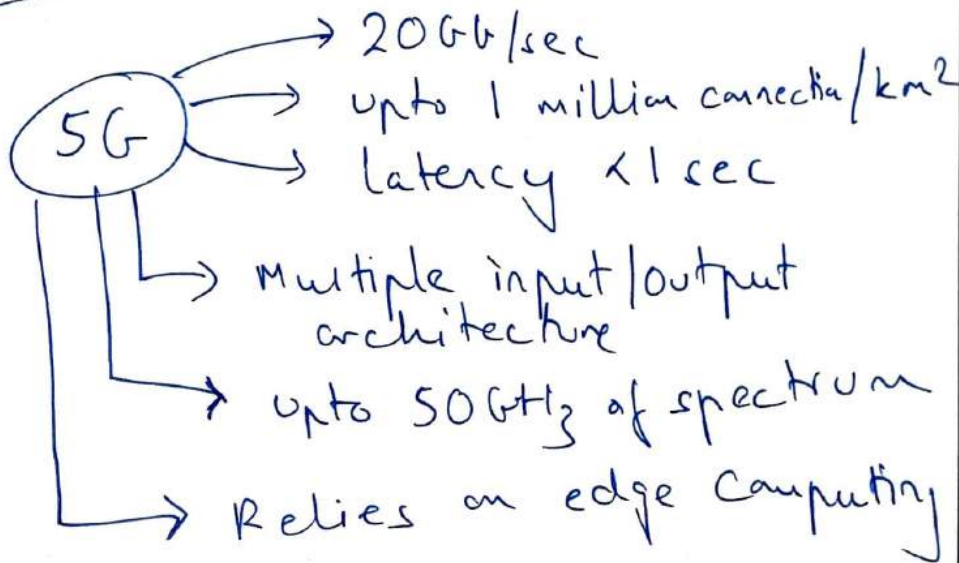
Thus it is essential to tackle the long recurring menace of flooding to help realize sustainable development and also achieve

17. How can 5G technology potentially bring about a digital revolution in India? Identify the challenges in adoption of 5G technology in India.

(250 words) 15

5G प्रौद्योगिकी संभावित रूप से भारत में एक डिजिटल क्रांति कैसे ला सकती है? भारत में 5जी प्रौद्योगिकी को अपनाने में आने वाली चुनौतियों की पहचान कीजिए।

5G technology is the evolutionary development over 4G promising much faster internet access with multiple and wide implications.



HELP BRING DIGITAL
REVOLUTION IN INDIA

→ Internet of things : As it can support much more connection density, IoT will be feasible.

- Artificial intelligence : Would get boost with applications like disease detection, cure, weather etc
- Remote areas : can be reached via tele education, tele medicine etc
- Bridge digital divide : Between regions/classes by provision of more hotspot clusters
- Augmented reality : Can help better train doctors, pilots etc with 5G
- Cloud computing : Would get a boost and may emerge as a sunrise industry in India
- Military/security applications : Can be better used with 5G eg Facial recognition etc

CHALLENGES

Technological

- Lack of backhaul infrastructure development
- High import dependence on telecom dependence
- 5G is power intensive thus need increased energy generation
- Lack of memory storage infrastructure needed after data explosion
- Lack of indigenous capacity legal
- Lack of privacy framework for data protection
- Issues of security vulnerability due to large number of devices

Societal

- Existing digital divide
- 5G equipment suited for high income category class as of now
- Thus 5G can help unleash computing power on much larger scale however

18. Besides computing, quantum technology has potential applications in various areas. Discuss. What are the challenges which lie ahead for effective utilization of quantum technology? (250 words) 15

संगणना के अतिरिक्त, क्वांटम प्रौद्योगिकी के विभिन्न क्षेत्रों में संभाव्य अनुप्रयोग हैं। चर्चा कीजिए। क्वांटम प्रौद्योगिकी के प्रभावी उपयोग के समक्ष आने वाली चुनौतियां क्या हैं?

Quantum technology is an emerging domain of computing which relies on 2 principles:

- ① Principle of superposition: Unlike conventional bits which are 0/1 quantum bits (qubits) can be 0 or 1 simultaneously
- ② Principle of entanglement: The qubits are entangled to each other and disturbing any one would disrupt the sequence.

Quantum computing has been used in computing to boost computational speeds ('quantum supremacy') however it has

wider applications

POTENTIAL APPLICATIONS

- ① Encryption : Quantum computing can help in encrypting and transmitting data (Eg Ques satellite of China)
- ② Medical : It can be used for faster sequencing of genome and prepare drugs
- ③ Weather : Quantum computing can be used to accelerate the process of forecasting of weather
- ④ Military : It can be used to develop sophisticated robot for specialized combat use
- ⑤ Food security : It can help create resilient seeds and boost food security

CHALLENGES

Technological

- Technology possessed by few countries eg US, China, Russia
- still at nascent stage
- Relies on complex physics phenomenon which are restricted to special labs

Financial

- Cost intensive research
- India has only 0.7% of GDP investment in R&D ~~budget~~
- Lack of private sector investment due to high gestation period

To spearhead quantum computing, government has launched National Quantum Computing Mission in Budget 2020. Quantum computing can help realize Digital India mission in uncharted territory.

19. While most insurgent groups in North-East India ~~have given up violence and are engaged in peace talks with the government~~, a number of issues could create hurdles in the future. Discuss. (250 words) 15
- जहाँ पूर्वोत्तर भारत में अधिकांश विद्रोही गुटों ने हिंसा छोड़ दी है और सरकार के साथ शांति वार्ता में संलग्न हैं, वहीं अनेक ऐसे मुद्दे हैं जो भविष्य में बाधाएं उत्पन्न कर सकते हैं। चर्चा कीजिए।

North eastern region has witnessed insurgency right since independence in several states such as Nagaland, Mizoram, Manipur Tripura etc

Success stories

→ Mizoram has seen end to insurgency due to sustained dialogue culminating in Mizo Accord in 1986

→ Tripura also saw drastic reduction in insurgency due to several welfare reforms undertaken (PDS, health, land reforms)

Peace talks

→ Bodoland insurgency has been

recurring since 1980s and recently pact signed with militant outfit (NDFB) who would lay down arms and would receive rehabilitation package

→ Naga peace deal is continuing process with NCCN (IM) with a peace deal agreed in 2015

→ Bru have been rehabilitated in Tripura thus ending their refugee like status

ISSUES CREATING HURDLES

→ Naga Peace deal

↳ NCCN-IM not agreeing to commit to Indian constitution

↳ Adherent to 'shared sovereignty' with separate constitution, flag etc

↳ Demand for 'greater Nagaland' creating tensions with neighbouring state

→ Bodoland deal

↳ Rehabilitation of individuals accused of violence creating unrest

↳ Expanding of Bodoland Territorial Council bringing areas with non tribal majority

→ Ethnic conflict

Of Naga-kuki and Kuki-Meite etc still not resolved

→ Support from Foreign powers
Such as China and Pakistan complicating process

→ Porous borders: Used by still belligerent groups like NSCN-IM

Thus several issues are still persisting which complicates the conclusion of conclusive peace. To achieve a lasting solution only a comprehensive and all inclusive dialogue process would be feasible

20. Identifying the key vulnerabilities in India's cyberspace, discuss the framework which should be adopted in the envisaged new cyber security policy in India. (250 words) 15

भारत के साइबर जगत में प्रमुख सुभेद्यताओं की पहचान करते हुए, उस रूपरेखा पर चर्चा कीजिए, जिसे भारत में परिकल्पित नई साइबर सुरक्षा नीति में अपनाया जाना चाहिए।

According to Symantec's
Internet Security Threat Report
India is the 3rd most vulnerable
country to cyber attacks.

Key vulnerabilities in cyberspace

- ① Cyber attacks : By state as well as non state actors
- ② Critical infrastructure : Is vulnerable
eg Kundakulam attack
- ③ Cyber espionage : Eg Brahmos engineer found with spyware in his computer (2018).
- ④ Denial of Service attacks :

These overwhelm the infrastructure

⑤ Cryptojacking : To hack and mine bitcoin

⑥ Cyber frauds : Via spoofing, identity thefts etc

⑦ Hacking of sensitive info :
Eg leaking of 32 lakh credit cards 2016

⑧ Cyber warfare : To breakdown infrastructure eg banking (As happened in Georgia)

FRAMEWORK NEEDED

Human resource

- Capacity building of cyber security information personnels
- Target of time bound raising of cyber security experts

→ Encouraging private sector to venture into cyber skilling

Legal

→ Promoting cyber insurance

→ Legal regime for regular cyber audit

→ Penalty for concealing cyber ~~and~~ frauds

→ Provisions for disclosure of information critical for national security.

→ Convergence of multiple cyber security institutions such as CERT-IN, cyberswaccha kendra, NC&IPC etc

→ SOP for major cyber attacks,

Thus as cyber arena is emerging as the 4th space of warfare, adequate preparation for both defensive and offensive capabilities should be reflected in the new policy