1.

Fiscal stability refers to a state in which the revenue inflows of the government are robust and stable and the expenditure is controlled. This ensures a low fiscal deficit and low revenue deficit.

Issues

→ Revenue Side

- post 101st Amendment (GST) states have raised concerns about not receiving compensation from centre.
  - eg West Bengal.
- Tax payer base remains low
- States have demanded greater financial devolution.
  - eg 15th Finance Commission provides devolution @ 41% .

→ Expenditure size

- continued freebie / "revadi" culture.
  - (eg) Free laptops, bus services...
- Return to old Pension Scheme.
  - (eg) in Himachal Pradesh,
- COVID induced rise in expenditure.

Measures to Address

FRBM 2003 aims to limit fiscal deficit and eliminate revenue deficit.

→ Preventing tax evasion / frauds.

→ Black economy makes up 20% of Indian GDP (IMF) ⇒ need to bring under govt. scanner to levy tax.

→ Use sovereign green bonds, PPP, CSR for funding.

→ move from subsidies ⇒ investment.

N.K commission (2017) recommendations can be the guiding light.

UPSC

2.

Product linked Incentives refer to government backed subsidies, tax benefits, etc that are provided to producers of certain products to encourage their domestic production.

eg: PLI on drones, semiconductors.

(Help in Achieving Atma Nirbhar Bharat).

→ Incentivize foreign producers to produce in India.

(eg) PLI has contributed to rise in FDI to an all time high of $70 billion in FY23.

→ Fillip to make in India · which aims at raising manufacturing levels in India.

→ Make Indian production space more competitive ⇒ attract MNCs.

(eg) Apple compiling iphones in India now, instead of China.

→ Can lower cost of production for investors
⇒ boost quantity in market.

→ Will reduce dependence on foreign sources for key products like semiconductors.
⇒ contributes to China + 1 strategy.

Challenges

→ Ease of Doing Business needs improvement.
(eg) India EoDB = 63rd rank in 2020 (WB) index.

→ Infrastructure constraints limit production
(eg) National Highways that comprise 2% of Indian road length carry 40% Indian cargo.

→ Bureaucratic/legal delays ⇒ deters FDI
(eg) Foxconn withdrawing

Thus, a multi pronged strategy that improves infra (Gati Shakti), raises EoDB. (eg: IBC 2016) and minimizes delay ⇒ Atmanirbhar in Amritkaal

3.

Millets refer to the fine grained, small seeded crops that are indigenous to the arid and semi arid regions of India.

eg : Jowar, Bajra ...

Millet growing regions

Advent of Climate Change

→ Has created (water scarcity) ⇒ millet needs less water.

(eg) As per NITI Aayog, India is set to see potable water demand exceed supply by 2030.

⇒ millet is improvement over water guzzling rice/wheat.

→ Millet is (photo-insensitive) and can also grow well in (low soil quality)

(eg) Land degradation is a consequence of climate change (UNCCD)

→ Low fertilizer requirement.

GoI Initiatives

Due to Green Revolution / MSP regime, millets were sidelined. Now, attempt to revive millet production via -

→ Rise in MSP on millet.

→ UNGA declaring 2023 as International Year of Millet on India's recommendation

→ Support to farmers w.r.t millet seed procurement

→ Highlighting its health benefits.

- High protein content
- Gluten Free
- Helps lose Weight.

41% of global millet production takes place in India. Thus, it can not only make Indian agriculture climate resilient but also act as an income booster to farmers.

UPSC

4.

~~It's~~ India has a 536 million strong livestock population – the largest in the world.

Livestock creates employment, generates income; and helps alleviate poverty.

(eg) India is the largest milk producer in the world.

Poor Quality and **Inadequate feed/fodder**

India's livestock is about 50% less productive than the global average (WB)

→ poor quality fodder ⇒ livestock health & immunity compromised

⇒ diseases

(eg) Black Quater, foot & mouth disease

→ Keeps livestock undernieght ⇒ market viability lowers

→ Reduces reproductive capacity.

→ Limited fodder due to competition for scarce resources.

(eg) Common grazing fields

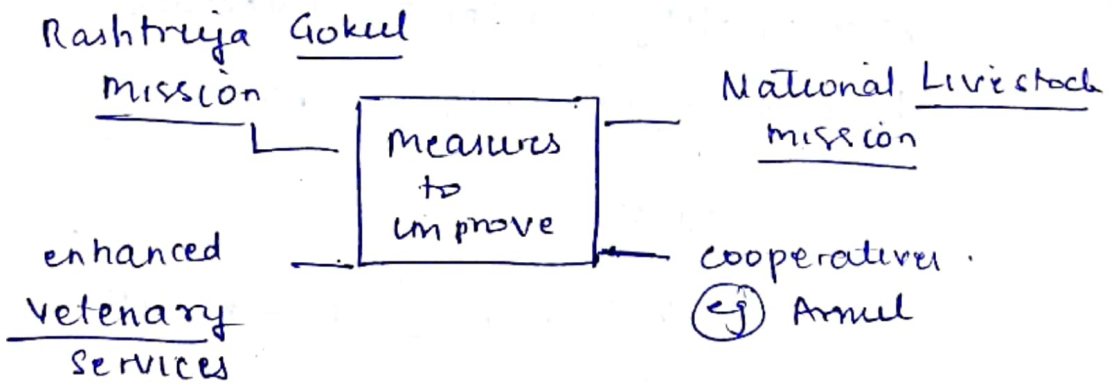
⇒ "Tragedy of Commons".

However, other reasons for low productivity

→ Lack of access to healthcare for livestock.

→ Low credit access to farmers

⇒ can not invest in livestock tech. like automatic milk extractors



In line with Article 48, need to organize animal husbandry on scientific lines to help the 70% rural households that own livestock

5.

Integrated Pest Management refers to a system in which a holistic, long term, and all-inclusive approach is used to counter the menace of pests.

Objective & components

→ Safeguard agricultural production.

(eg) India's ~~food~~ grain output of 315 million tonnes in FY23 is threatened by pest destruction.

→ Use technology to identify and eliminate pests

(eg) Artifical Intelligence enabled sensors placed in fields.

→ generate awareness in farmers about pest management.

→ provide access, availability, and affordability to pest management tools.

- (eg) insecticides, pesticides → receive subsidy
  ⇒ significant portion of GoI's ₹ 5 Lakh crore subsidy expenditure in FY23.

→ Infrastructure development to reduce damage. (eg) NITI Aayog recommends warehouse expansion.

→ Drones to spray pesticide

The IPM can act as a lifeline for the 45% of labour force that depends on agriculture for its livelihood.

UPSC

6.

Operation Dost highlighted the importance of international cooperation in disaster risk management.

Significance

→ Allows cross border assistance.

(eg) Operation Vanilla - food relief by India in Madagascar in 2020

→ provides new domain for collaboration

(eg) HADR initiative under QUAD.

→ ~~Spread~~ Creates goodwill.

(eg) India as first responder to disasters in other nations.

→ Can leverage and develop technology collectively

(eg) NASA & ISRO's NISAR satellite helps in disaster risk reduction

→ Helps India reduce disaster cost.

(eg) WB: Business as usual approach will cost India 11 trillion by disasters by 2047.

Regional Cooperation

→ In line with Gujaral doctrine ⇒ India extends unilateral assistance.

(eg) during cyclone Mocha in Bangladesh

→ BIMSTEC to counter disaster risk in Bay of Bengal region.

→ IOR forum. ⇒ provides platform to reduce disaster risk.

→ CDRI ⇒ India has extended assistance to Maldives and others at threat of submergence

→ In line with Sendai Protocol and National Disaster Management Plan 2016, India should continue to reduce disaster risk.

7. Sand mining has become major cause of concern due to its destabilizing effect on local ecological balance. Sand is a minor mineral under control of state government.

Economic benefit

→ sand used in construction process ⇒ needed to meet our target of ₹ 10 L crore spent on capital expenditure in budget 2023-24.

→ Sand is exported ⇒ forex contributes
↳ $ 600 billion.
⇒ Helps tackle current account deficit = 2.5%.
currency

→ Sand is a resource endowment which must be harnessed for growth. ⇒ $ 5 trillion.

However, costs –

→ Biodiversity harmed.

(eg) Crabs, snakes, rats, rabbits....

⇒ violates Kunming Montreal framework signed at COP 15 @ Montreal (2022).

→ Soil destabilized ⇒ soil erosion, soil degradation

└ This concern has been raised by UNCCD.

→ Soil harmed ⇒ water percolation hindered
⇒ groundwater replenishment.
⇒ agriculture which uses 90% groundwater extracted harmed.

→ Deforestation ⇒ meeting 33% forest-cover target of National Forest Policy 1988 hindered.

Solution → EIA of sand mining
→ Use NISAR to track illegal mining
→ involve local communities

Sustainable sand mining ⇒ sustainable development ⇒ Life on land [SDG 15]

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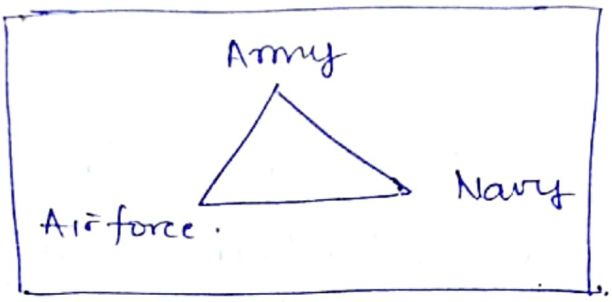
8.

Theatersation plans in the defense forces will allow greater collaboration between different units of the armed forces by making them work together.



Rationale –

→ In line with Kelkar Committee 2004 recommendation to modernize defense forces.

→. Prevent work in silos.

→ Allows sharing of tech, tools, expertise.

⇒ DRDO can function more holistically.

→ Will provide comprehensive defense against potential two front war

Ichina, Pakistan

→ Chief of Defence Forces can exercise better decision making when forces collaborate.

Challenges

→ Will need period of adjustment since it a new idea.

→ Hierarchy of officials will have to be reworked when the branches collaborate.

→ Agnipath scheme is already bringing in new changes ⇒ too many changes at once may burden the system.

→ Need to focus on technology development in defence too (eg) Drones, quantum tech, etc

A gradual move towards theaterisation will allow India's defence forces to counter aggression from hostile powers.

⇒ 3rd ARC recommendation to strengthen defence mgt.

UPSC

9.

Shell companies refers to companies that have been set up with the sole purpose of channelizing funds/money through them to evade taxes or enable money laundering

Money Laundering: illegally obtained funds ⟶ introduced into economy as legitimate funds.

How Shell Companies are used

→ They obscure the source of origin of funds. (eg) Shell companies that operate from Maldives/Mauritius.

→ Allow for "round tripping" of funds.

→ Make it difficult for national governments to track fund movements since multiple international jurisdictions involved.

→ Shell companies in countries like Netherlands, Iceland are protected from legal action from India.

Steps Taken

→ Prevention of Money Laundering Act 1988 monitors shell companies.

→ FEMA 1999 is also leveraged for the same.

→ ED surveillance helps track shell companies used to launder money

→ International collaborations

(eg) FATF to curb shell company based money laundering.

Globally, about $2-4 trillion are subject to ~~for~~ a Money laundering every year (IMF). India must strengthen its financial infra to combat this.

10. (BDC)

India has set up a biological data centre in Haryana to protect, preserve, and study crucial biological data -

↳ microbes, pathogens, stemcells....

Objectives & Significance

→ In the past COVID-19 era gene mapping and pathogen tracking needed to protect against new variants.

⇒ enabled by BDC

→ Anti-microbial resistance can be studied with data of BDC

⇒ Help meet "One Health" objective

⇒ Article 21 (Right to life) protected.

→ New threats like zombie virus can be studied - ⇒ protect health of citizens (SDG 3)

UPSC

→ Helps develop new tech –

(eg) gene editing ; CRISPR , etc.

→ Enhances agricultural productivity

(eg) GM crops like BT cotton, Golden rice, etc

→ Helps in conservation of specie genetic code ⇒ protects biodiversity

⇒ supports Biodiversity Act 2002

→ Helps store sensitive biological data safely.

→ Prevents domestic biological data to be stored in foreign servers

⇒ Data localization enabled

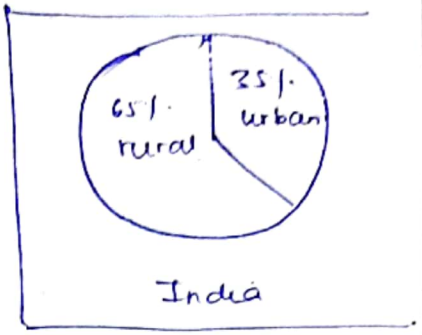
⇒ Atma Nirbhar Bharat.

Hence, the BDC can act as the key to protect human health & help economic growth. to meet Panchpran targets.

UPSC

11.

Currently, 35% of Indian population resides in urban centres. Urban centres often face a resource crunch while trying to meet the objectives of the National Urban Policy 2019.



Need for municipal bonds

→ Devolution of funds to municipalities remains low.

→ In some states, even the State finance Commission is not regularly set up.

→ Hence, perennial fund deficit.

⟹ limits capital investment.

Using municipal bonds ⇒ funds can be raised to meet capital investments like

→ road construction

(eg) As per NSSO roads in urban centres are regularly subject to potholes ⇒ hinders transport

→ Schools, healthcare, etc facilities to cater to the 450 million people in cities.

→ Sewage development in line with AMRUT scheme.

→ Sanitation, toilet facilities under Swach Bharat Mission.

Concerns

- bond market in India remains ~~used~~ underdeveloped.
- low bond ratings ⇒ need to provide higher interest rate to lender
- Can leverage PPP, CSR funds, instead.

  eg Tata providing Nagpur water delivery public service

Municipal bonds can act as a medium to strengthen local governance and meet the vision in letter & spirit of the 74th constitutional amendment act 1992.

UPSC

12- Since independence, women have made strides in various fields as seen by:

	1950	currently
Female literacy	8%	70%.
TFR	5.6	2.0
IMR	180/1000	28/1000

→ However, India FLFPR = 24%.

- China FLFPR = 60%.
- even Bangladesh has higher

} need for improvement

→ Further as per IMF if we make female and male workforce participation equal in India

⇒ 27% boost to GDP.

Reasons for low FLFPR

→ patriarchal belief that women must remain in domestic spaces.

→ ~~Father~~ Paragariya noted withdrawal of rural females from workforce (post 2005) when family income stabilized.

→ India's Gender Gap Index rank = 135/146 (2022)

→ Workplace Harassment despite PoSH Act 2013.

→ Gender pay gap ⇒ discourages women.

→ Transport limitations ⇒ safety concerns.

→ lower educational & skill (training) levels than men (eg) male literacy = 84%.
female literacy = 70%.

⇒ women have not been absorbed in our skill intensive, service sector led growth

Measures to improve

① Education for work readiness

(eg) Beti Bachao, Beti Padhao.

② Encouraging entrepreneurship (eg) Stand up India

③ MSME promotion (eg) 14% MSMEs are owned by women.

④ Equal Renumeration Act (1976)

⇒ to plug pay gap.

⑤ MGNREGA : 1/3 reserved for women.

⑥ Internal Complaints Committee in every workplace with > 10 employees

As Swami Vivekanand said —

"No nation can fly with one wing tied".

⇒ Raise FLFPR to meet panchpran goals.

13.

The post harvest value chain is marred by infrastructure challenges that lead to crop loss. The 86% of Indian farmers who are small & marginal are particularly vulnerable.

Inefficiencies

→ Results in crop losses due to damage.

(eg) As per NITI Aayog, only 10% food is under cold storage

→ Limits food processing industry.

(eg) Only 10% food grains are processed in India

→ Lack of certifications ⇒ hinders exports

(eg) by AGMARK.

⇒ India has potential to raise agri exports beyond the $50 billion in FY21.

→ lack of access to market networks

⇒ post harvest value chain compromised.

Steps

→ The 1 lakh crore Agriculture Investment Fund is developing post harvest technology

→ NITI Aayog : suggested expanding network of warehouses, cold storage units

→ marketing
- e-NAM : 2 crore farmers used.
- e-Choupal : connects farmers to global market.

→ KISAN call centre

⇒ to enhance awareness w.r.t govt-schemes

→ KISAN RAIL and KISAN UDAAN.

⇒ post harvest transport.

→ SAMPADA Yojana and Mega Food Park Scheme ⇒ to aid Food processing industry..

→ APEDA → working to promote exports and branding

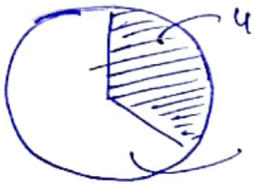
The S&M farmers will benefit from these initiatives. Further, incorporation of tech based solutions in post harvest value chain will help raise agriculture share in GDP from the 16%. currently

UPSC

14.

India's energy sector is undergoing many changes to meet the energy needs of a 1.4 billion strong population in the Amritkaal.

Decarbonization



40% renewable energy
60% non-renewable
} India's energy mix.

→ With 500 GW set to be generated from renewable energy sources by 2030 (panchamrita target)

⇒ rapid decarbonization

→ proposed carbon tax by EU ⇒ need to decarbonize to maintain export competitiveness.

→ Share in energy of solar (14%), wind (10%) and nuclear energy (3.2%)

is rising

→ Electricity Rules 2022 provided Green Open Access i.e consumers can demand green energy from DISCOMS.

Decentralization

→ centre encouraging state discoms to reduce A&T losses by taking greater control.

→ ADITYA scheme → encourages private sector participation in energy provision
(eg) Mauthon Power Plant by Adani.

→ Helps reduce confrontational federalism
⇒ strengthen "national grid"

UPSC

Digitization

→ Will help India become carbon neutral by 2070.

→ AI, blockchain, quantum computing,

↳ used to monitor / regulate electricity usage.

(eg) ACs automatically switching off when no person in room.

(eg) AI predicting energy demand to ~~about~~ prevent electricity outages.

~~Since~~, A robust energy sector will power India's journey towards a $5 trillion economy. Becoming an energy independent nation by 2047 ~~should~~ is the aim.

15.

Chemical disasters like the Bhopal Gas Tragedy 1984 infringe upon the Right to Life (Q | A 21) and SDG 3 (good health) by jeopardizing human well being.

(Challenges in mitigating)

→ Accountability in chemical disasters remain low.

(eg) Bhopal Gas Tragedy victims are still demanding compensation from Union Carbide

→ Long term costs often ~~go~~ outlooked

(eg) genetic changes, cancer development, etc due to chemical exposure.

→ Lack of trained specialists to counter a chemical disaster.

→ Technology to help clean up post chemical disaster is low.

→ Awareness low ⇒ chemical plants often set up in localities with dense population

→ Healthcare system is not equipped to deal with such disasters.

(eg) Since only 2.1% of GDP is spent on health, funds available to study reaction of body to different chemicals is limited.

→ Spatial spread of chemical ⇒ difficult to counter it. ⇒ spreads to soil, groundwater ⇒ agriculture threatened.

(How to Address)

→ Comprehensive policy to deal with Chemical disasters ⇒ add special clause to (National Disaster Management Act 2005).

→ Fast track courts to resolve demand for compensation.

→ leverage nanotechnology to develop tool, devices to clean up post disaster.

→ Robust EIA before setting up chemical plants

→ "Polluter Pays Principle" should be strictly enforced

→ multilateral cooperation in case offender is MNC ; (eg) in Union Carbide case.

→ Seek international aid in QUAD, WHO, etc to mitigate large scale chemical disasters.

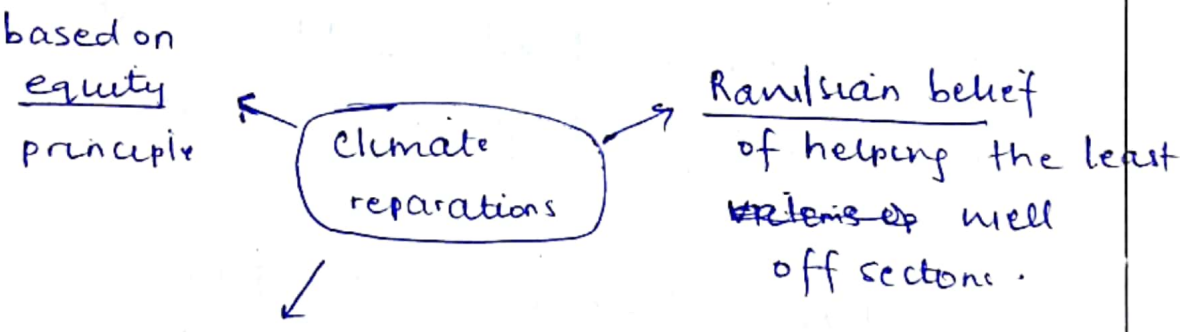
As per 2nd ARC, there is a need to prepare for Disasters ~~can~~ in advance to ensure that when they strike, we are ready. As it said -

"Better to prevent & prepare than to repent & repair"

16-

Climate Reparations refers to the demand that the polluters and climate change creators like developed countries, rich people, urban centres, etc owe a compensation to the victims of climate change, usually poorer people.

(eg) Discussions pertaining to Loss & Damage Fund @ UNFCCC COP 27.



(eg) Post the Pakistan floods, 2022 which displaced 1 in 7 Pakistani (mostly poor, rural population), there were

demands that the West should compensate the nation.

Need to Implement

→ Historical polluters are not proportionately bearing the burden of climate change.

(eg) US has contributed to 25% of CO_2 emissions since 1850.

→ The per capita pollution emissions of developed West remain high.

(eg) GHG emission per person in India = $3CO_2e$ whereas in USA = $14CO_2e$ per annum.

→ Climate changed induced disasters ⇒ economic damage to poorer nations

(eg) As per World Bank, India loses 2% of its GDP to natural disasters every year

→ Funds needed for technology development in poorer nations. (eg) Solar energy related tech

→ concern for poor ⇒ UN Convention on Human Rights.

Challenges

→ Resistance from those that need to provide reparations. (eg) US and EU.

→ Difficult to put economic value on loss caused by climate change.

→ Biased multilateral platforms (like UNSC)
⇒ will favour richer nations.

→ Money will not be able to counter the damage already done.

India should continue to be the "Voice of the Global South" and leverage its G20 presidency to demand climate reparations.

UPSC

11.

Invisible warfare refers to the tactics of aggression displayed by nations that are not in the form of traditional usage of weapons / force.

(eg) AIIMS cybersecurity attack 2022 → allegedly by China.

Components.

→ online crimes
- hacking
- honey trapping. (eg) recent DRDO case.
- data colonization
- fake news.
- invasion of data privacy.

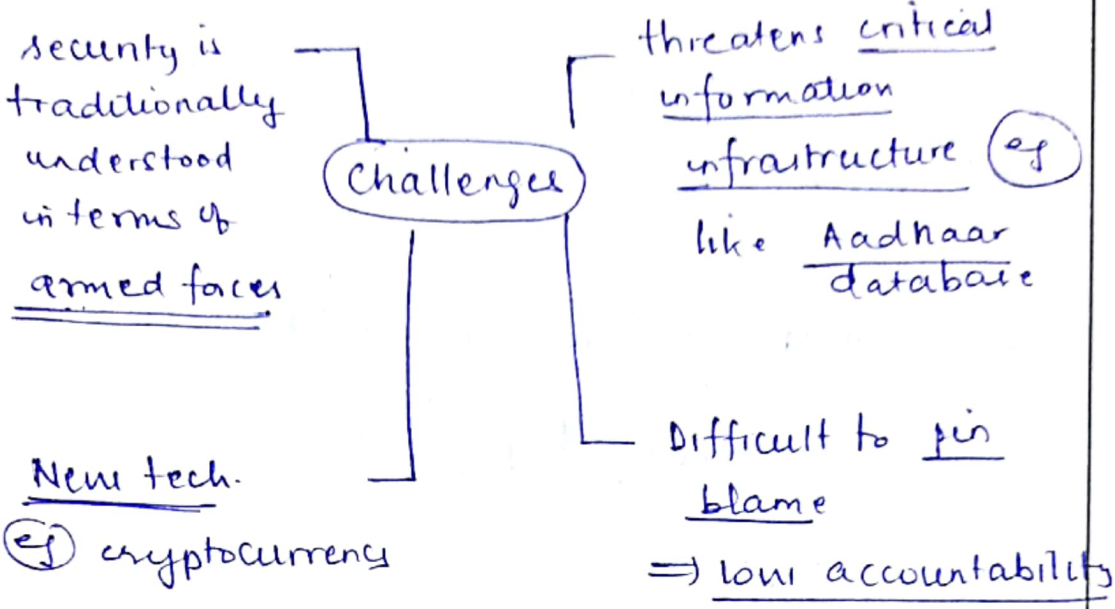
→ economic - (eg) Dumping of products to destabilize economy, harm local producers

→ biotechnology. (eg) Allegations that COVID was a lab made virus by China.

→ counterfeiting : (eg) Pakistan sending

UPSC

FICNs to India via drones



Steps

~~Ecosystem~~ Cyberspace

(i) National Cyber security Policy 2013.

(ii) IT Act 2000.

(iii) CERT-in

→ Help crack down on hacking, phishing, online scams.

(iv) IT Act 2000 section 69(A) and PIB fact checking unit ⇒ regulates fake news

(V) Srikrishna committee - highlighted importance of data privacy.

(VI) Data localization norms.

(VII) Banning TikTok (China).

Economic

→ WTO discussions (eg @ Geneva Conference 2022).

→ restricting Chinese imports.

→ FATF, Delhi Declaration → counters invisible warfare & money laundering.

Bio tech — India has demanded fair investigation into the COVID-19 origin.

Invisible warfare can act as the biggest threat to world in the era of the 4th Industrial Revolution. As Obama said "The 3rd World War may be fought online".

18 -

Geospatial data refers to the data procured from satellites that maps the feature of the earth. National Geospatial Policy 2022 aims to leverage this technology

Significance

→ Helps monitor areas with disturbances

(eg) geospatial tech used to track LWE areas in Chattisgarh.

⟹ helps spot militant camps.

→ In areas with challenging geography, it enhances internal security.

(eg) North East — 70% hills.
40-70% Forest cover

⟹ help counter NSCN, ULFA ...

→ Enhance border security.

(eg) Tracks drones from Pakistan that are used to drop drugs, weapons and counterfeit currency into India.

→ Monitor movement of enemy troops.

(eg) Helps Indo-Tibetan Border Police track Chinese troop movements.

→ During high profile, sensitive events ⇒ geospatial surveillance

(eg) during Republic Day celebrations @ Red Fort.

→ Helps predict occurence of natural disasters

⇒ prevents damage to life, property.

⇒ prevents proliferation of anti-social elements in the chaos that follows

(eg) Tracking Brahmaputra flooding.

→ Needed for strategic armed forces decisions.

(eg) Determining ideal location of troops, ships, submarines, etc.

→ Assist the Central Armed Police force in counter insurgency and maintaining public order.

Thus, geospatial data produced by Remote Sensing Satellite, NISAR and NaaVIC can allow India to ~~pro~~ modernize our defense forces (as recommended by Kelkar Committee 2004) and enhance national security.

UPSC

Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
(Specimen Answer Booklet - For Practice Purpose Only)

19.

AI refers to the technologies that replicate human intelligence. (eg) Online doubt solving platforms powered by AI.

AI can be used under the ambit of NEP 2020 to revolutionize education.

Traditional Teaching ~~Instructor led~~

classroom based Facts driven Focus on books lack of audio/ visual tools	AI →	dynamic classrooms. enables interesting data presentation Focus on learning incorporates multi sensory inputs.

→ Will equip teachers with tools to enhance classroom delivery in the 15 lakh schools in India.

→ AI driven robots can also teach.

→ Help in flexible teaching — any day, any time.

→ AI ⟹ students can be taught in their vernacular languages more easily.

Student Learning

→ Interactive technology rather than dry learning ⟹ greater retention.

→ Allows student specific feedback, course adaptation.

→ democratization of education.

(eg) via Unacademy, BYJU, etc → edu. has spread to all corners.

→ Helps counter "learning losses" experienced during COVID (UNICEF)

UPSC

However, some concerns—

(I) · Limited penetration ⇒ disparity.

(eg) Only 34% Indian schools have access to internet, let alone AI.

(II) AI lacks human touch, can not provide ethical training.

(III) Against traditional Guru-Shishya relation envisioned by Gandhiji

(IV) Poor will have lower access. (eg) 15% Indians in poverty (NITI Aayog) will have limited access.

(V) Cheating (eg) using ChatGPT, Bard for homework.

Thus, need to ~~progress~~ proceed with caution.

Spreading internet access to all corners of India via Bharat Net ⇒ first step in equitable AI usage

20.

Homi Bhabha is also called the father of India's nuclear mission. His vision built the base on which our "atoms for peace" approach to nuclear technology is built.

Contribution

- Headed the Department of Atomic Energy

- collaborated with ~~Russian~~ American, Soviet scientists to help India set a nuclear base. ⇒ Kundankulam plant was set up eventually

- Help change hostile public attitude towards nuclear energy in the aftermath of Hiroshima, Nagasaki ~~(illegible)~~

- Set up nuclear power plants. Today India has 22 such plants.

UPSC

Should India prioritize nuclear energy?

→ India's electricity needs are growing at 4% per annum. Further, this number is expected to rise.

→ 7% Indians continue to not have electricity access.

→ Nuclear energy which ~~market dep~~ meets 3.2% of India's energy needs currently ⟹ huge potential.

→ ~~Eg:~~ Climate friendly tech, will help phase out coal and will provide relief if EU imposes carbon tax.

→ Reduce import dependence. (eg) 85% of our energy needs are imported.

→ New tech like (Fast Breeder Reactors) ⟹ even more efficiency

UPSC

Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
(Specimen Answer Booklet - For Practice Purpose Only)

Concerns

→ India imports uranium and plutonium.

→ Negative public perception

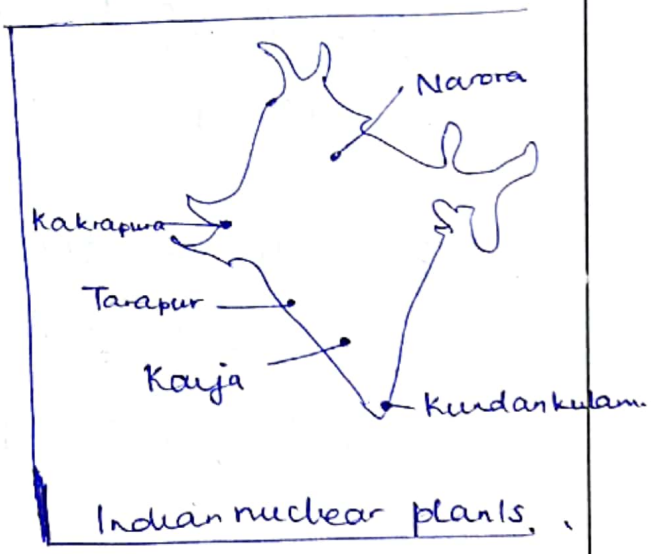
(eg) Japan releasing Fukushima treated water into its sea ⇒ panic in China.

→ Nuclear waste disposal ⇒ a challenge!

→ Nuclear sites ⇒ sensitive to attack by enemies nations.

→ Nuclear disasters

(eg) Chernobyl 1986
Fukushima 2011



Indian nuclear plants.

Thus, a gradual move towards nuclear energy with checks & balances

⇒ Atmanirbhar Bharat + Panchamrita goals met