

UPSC

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Name : MANNAT LUTHRA
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CENTRE : online

MqP
2025

English medium

Test code : 813411

Date : 28 July 2025

Time : 2-5:10 PM

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Q1. The Union Budget targets the debt-to-GDP ratio of $50\% \pm 1\%$ for the Union by FY 2030-31 while targetting fiscal deficit at 4.4% for FY 26.

Rationale behind the shift:

- ① Presents a more realistic picture of the debt situation
- ② Better indicator of the sustainability of debt
- ③ Fiscal deficit only depends on expenditure and revenue → Does not indicate actual debt
- ④ Mandate of the FRBM Act, 2003 which targets the ratio at 40% for centre
- ⑤ Also a recommendation of Dr. NK Singh Committee.

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- ⑥ Used by credit Rating Agencies to ascertain the fiscal situation
- ⑦ Real time fiscal scenario of the economy can be known (stock concept)
- ⑧ Indicator of macroeconomic stability and overall debt management
- ⑨ Exposes internal and external vulnerabilities of a country to economic shocks
- ⑩ Easy to monitor and evaluate.
- ⑪ Practice of other economies

Thus, the shift is in interest of presenting a more holistic and accurate picture of a country's fiscal management.

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Q2

The share of manufacturing sector in India is around 14%, according to Economic Survey 2024-25, which is low for a labour-surplus country like ours.

India needs to transition from a 'build to print' to a 'build to design' model because:

- ① It will facilitate transition from low income - low productivity - low paying activities to high income - high productivity - high paying jobs (R&D)
- ② Move up the smile curve and integrate into global value chains

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- ③ Insulate ourselves from economic nationalism and de-globalisation trends
- ④ Achieve atmanirbharata (self-reliance)
- ⑤ Capitalise on our huge market with high purchasing power → high growth
- ⑥ Reduce dependence on foreign companies and countries
- ⑦ Boost Make In India, consumption and employment generation.

Steps taken by Government:

Design linked Incentive scheme, Atal Innovation Mission, R&D fund of ₹1 lakh crore, India AI Mission, Start UP India, etc.

It is an imperative to achieve SDG9.

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Q3) A nutrition-sensitive food system accords priority to nutritional security attained via food through its availability, accessibility, affordability and utilisation and absorption by the body.

Nutrition - sensitive food system and strategies:

- ① Due regard to various nutrients in food:
vitamins, minerals, proteins, etc.
- ② Use of scientific methods:
GM crops, bio-fortification, etc.
- ③ Diversity in food intake:
cereals, fruits, vegetables, pulses, millets, etc.
- ④ Provision of market - intelli

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- genue to farms (demand-driven model)
- ⑤ Adequate connectivity and transportation linkages with markets
 - ⑥ Presence of storage infrastructure (eg. cold chain infrastructure)
 - ⑦ Due emphasis of agri R&D
 - ⑧ crop diversification: Horticulture, apiculture, viticulture, etc.
 - ⑨ Focus on allied sectors: Animal husbandry, poultry farming, etc.
 - ⑩ Efficiency in use of inputs: land, water, etc.
 - ⑪ High-yielding seed varieties, natural and organic farming, etc.

Nutrition-sensitive food systems are paramount for achieving

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Q4) The Digital Agriculture Mission aims at building digital public infrastructure for the agriculture sector.

It has 2 key components:

① Agri stack

↳ Farmers' registry: Unique ID for each farmer

↳ land referencing for creation of digital records

↳ crop sown registry for all farms

② integrated remote sensing data to facilitate decision making for farmers in input use

Benefits to agriculture sector:

① Enhance input use efficiency through informed data

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- ② Reduce issues involving land: litigation, transfer, lack of records, etc.
- ③ Integration of technology for higher productivity
- ④ Facilitate informed decision-making
- ⑤ Enable farmers to realise higher incomes on a sustainable basis
(Doubling farmers' income — Dalwai Panel)
- ⑥ Improve agricultural supply → control food inflation
- ⑦ Real time assessment of country's agricultural prospects
- ⑧ Empowerment of our farmers.

In the words of Arthur Lewis, "If a nation wants to industrialise, it should enrich its farmers."

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Q5) Rare earths are a group of 17 elements which are foundational to our advances in technology and electronics.

Foundational inputs that act like 'seeds of technology!'

- ① Critical to manufacturing of electronics: Batteries, cells, televisions, refrigerators, etc.
- ② Resource for further technological advances: AI, blockchain, Internet of Things, etc.
- ③ Facilitation of clean energy transition and meeting climate change targets (renewables).
- ④ Boosting R&D and innovation

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- 5) Ensuring energy security and energy independence.
Nuclear energy, solar energy, green hydrogen, etc.
- 6) Basic raw material for IR 4.0 (semi-conductors)
- 7) Inputs for space and defense technology
- 8) sustaining our commun-
ication systems (59)
- 9) Furthering advances in nanotechnology, robotics, quantum computing, etc.
- 10) Technological spin-offs for agriculture, health, education, etc.

In the present era where rare earths are being weaponised by china, their exploration in India must be encouraged to sustain our upward march on the scientific trajectory.

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Q6) Electrostatic Precipitators and Flue gas desulfurization systems are equipments used to deal with emissions of oxides of sulphur from thermal power plants.

Electrostatic Precipitators is a more viable and effective option compared to flue gas desulfurization systems:

- ① Better functioning : More efficient in filtering
- ② Better at handling pollutants. less chances of collateral damage
- ③ More shelf life and cost effective
- ④ can filter out large and small particles

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simultaneously

- ⑤ less hassles involved in retrofitting
- ⑥ More acceptable to Indian thermal power plants
- ⑦ Very few modifications needed
- ⑧ less time consuming
- ⑨ Effective in arresting pollution caused by SOX.
- ⑩ Improvement of air surrounding thermal power plants.
- ⑪ Fulfilment of ESG imperatives of plants and control of negative externality (pollution)

Making our towns and cities more breathable and liveable is essential for fulfilling the state's duty under Article 48A.

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Q7) Environmental Impact Assessment is a tool available with planners to ensure environmental conservation along with developmental activities. It is backed by the Environment Protection Act, 1986.

Key challenges in EIA implementation:

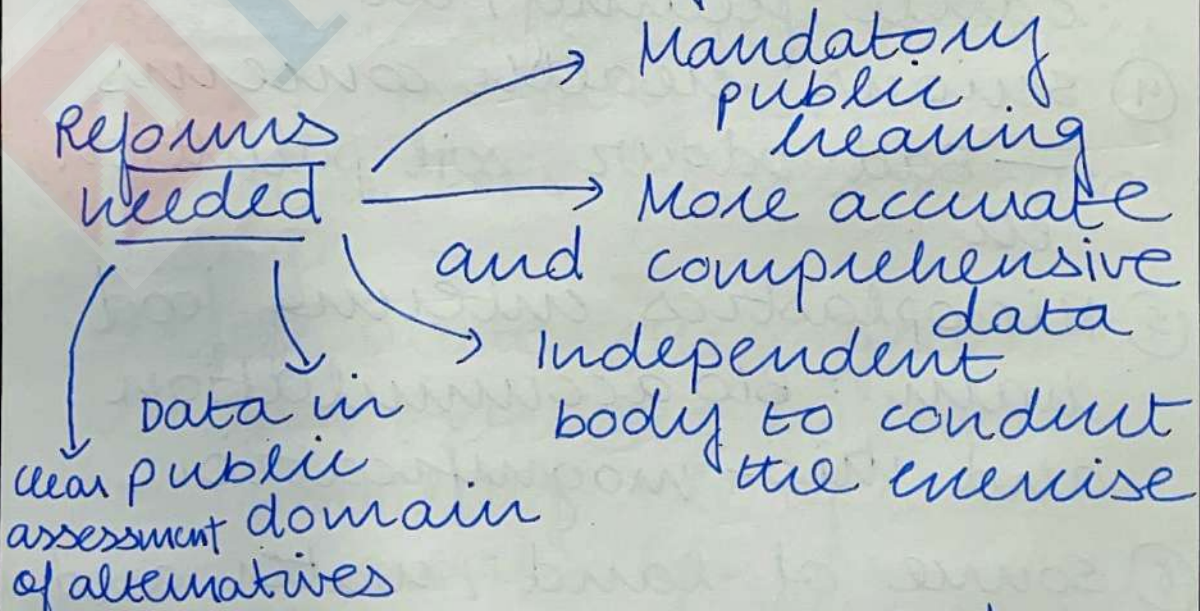
- ① Grant of clearances in extremely sensitive areas (Eg. Great Nicobar Project)
- ② Lack of consensus-oriented approach
 ↳ Public hearing not mandatory for all projects
- ③ Lack of comprehensive data for impact prediction and assessment of alternatives

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- 4) No independent regulatory body : conflict of interest for Environment ministry
- 5) Delays in publication of detailed findings
- 6) lack of participatory approach → locals usually sidelined
- 7) seen as a 'green hurdle' to development and growth
- 8) Mechanical and subjective exercise
- 9) lack of transparency and accountability



Amendments are needed in the Act to incorporate these.

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Q8) India holds the unenviable distinction of being the biggest plastic polluter in the world with annual generation of 10 million tonnes on an average.

Serious environmental threat:

- ① Requires more than 500 years to decompose
- ② Problem of landfills overflowing with plastic waste
- ③ Harboring of rodents, flies, cattle feeding, etc.
- ④ serious health concerns — Bad odour, soil pollution, etc.
- ⑤ Microplastics entering food chain : Bioaccumulation and bio-magnification
- ⑥ source of land, water and air pollution

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Mitigation measures needed

- ① 3 R strategy: Reduce, reuse, recycle
- ② Behavioural change among people to avoid plastics
- ③ Formalise waste collection
- ④ Waste segregation at source
- ⑤ Finding alternative uses
→ circular economy
road construction
- ⑥ Waste to wealth usage
- ⑦ Incentivising industries
minimising plastic

Government initiatives

- ① Ban on single use plastics
w.e.f. 1st July 2022
- ② Mission LIFE for behavioural change
- ③ Plastic Waste (Management) Rules → Extended Producer Responsibility, role of local governments, etc.
- ④ campaigns and advisories
Tackling plastic pollution is needed to achieve SDGs 14 & 15.

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Q9)

Internal security refers to the imperative of maintaining peaceful, secure and harmonious conditions within a country's borders.

India's current internal security architecture amid evolving threats :

- ① Multiplicity of institutions and agencies : Police, CAPF, NSA, PMO, IB, RAW, etc.
- ② Lack of coordination
- ③ Frequent intelligence failures (attacks by Pakistan)
- ④ Poor cyber security (hacking of servers)
- ⑤ Catching-up and reactive approach instead of a proactive approach.

ways in which private sector can contribute to strengthening

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internal security:

- ① Professionalism and expertise in new technologies (drones, cyber security, etc.)
 - ② Incentive for innovation and R&D (profit motive)
 - ③ Reduction in men, money and material for government
 - ④ catering to evolving tech needs (ethical hackers, offensive cyber systems, etc.)
 - ⑤ Provision of public goods in PPP mode (red corridor)
 - ⑥ competition for government agencies (DRDO)
 - ⑦ Training of forces in a professional manner, recruitment functions, etc.
 - ⑧ Data collection and analysis
- Involvement of private sector can be a game changer for our security apparatus.

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Q10) Radicalisation refers to the process of indoctrination of minds to the effect of changing one's ideological beliefs.

Role of socio-economic factors in Jammu and Kashmir:

- ① Lack of employment opportunities: low presence of industry and services
- ② vicious cycle of poverty and lack of avenues
- ③ Poor status of health and education facilities
- ④ Virtual absence of private sector
- ⑤ low opportunities for skill enhancement
- ⑥ Environment fuelled by distrust, depletion of social capital, us v/s them attitude, religious divide, etc.

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Role of external influences

→ Pakistan's deep state (ISI) and ISIS using social media handles, providing logistics and training, etc.

countering radicalisation through education and youth engagement

- ① Targets those who are most vulnerable and impressionable
 - ② Builds trust in state's agencies
 - ③ Meaningful participation in recreational and academic pursuits
 - ④ Building up of social capital and reaping demographic dividend.
 - ⑤ Youth can function as 'eyes and ears' for Government
 - ⑥ Development of critical thinking and analytical mindset.
- It is an imperative to counter terrorism in the valley

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Q11) The Economic Survey 2023-24 highlights the importance of care economy and how India can capitalise on it to achieve higher growth.

Key characteristics of care economy :

- ① Usually includes work performed by women in a household
- ② Includes care work for dependents : elderly and children
- ③ Usually unpaid as well as underpaid (domestic helps)
- ④ Lack of social security, job security, bargaining power, etc. (informalisation)
- ⑤ Essentially a support function

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- ⑥ Exacerbates dual burden for women: Household + outside work
- ⑦ lack of organised nature in India
- ⑧ Potential to generate value for the economy: Nurses, nannies, caretakers, etc.
- ⑨ unpaid work by women amounting to around 3.1% of GDP in India (UN Women)
- ⑩ Marred by gender stereotypes and stigma: gendered economic activities.

Integration with economic framework in India:

- ① Formalisation of the sector: Provision of social security benefits, registration of workers, etc.
- ② Encouraging startups catering to child care

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and silver economy.

- ③ Enumeration of workers engaged in care economy and specific schemes targeting them (on the lines of gender budgeting)
- ④ Removal of gender stereotypes
- ⑤ Encouraging equal sharing of household responsibilities by men and women
- ⑥ Addressing time poverty among women (5.5 hours - MosPI)
- ⑦ collaboration with civil society for positive engagement in crèches, old age homes, etc.

Formalisation of care economy can increase women's LFPR in Indian economy for an inclusive and equitable society.

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Q12)

Artificial Intelligence refers to the simulation of human intelligence processes by machines involving 3 processes learning, reasoning and self-correction.

Unprecedented opportunities for India's labour market:

- ① creation of new jobs. Eg. AI developer
- ② Higher productivity through efficient tasks. Eg. Real-time coding by AI models
- ③ Potential for innovation of new products and services
Eg. Revamping of entertainment industry
- ④ Entry into high income activities. Eg. R&D

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- ⑤ Efficient manufacturing processes → Automation of factories
- ⑥ Enhancing agricultural productivity → Internet of Things (AgriTech)
- ⑦ Increasing value of creative jobs. Eg. writers, artists, photographers, etc.

significant challenges for India's labour market:

- ① loss of mechanical and semi-skilled jobs. Eg. coders, typists, assistants, etc.
- ② Taking over some creative jobs. Eg. Movie writers and directors
- ③ Adaptation to inherent biases of AI models. Eg. Preference for male

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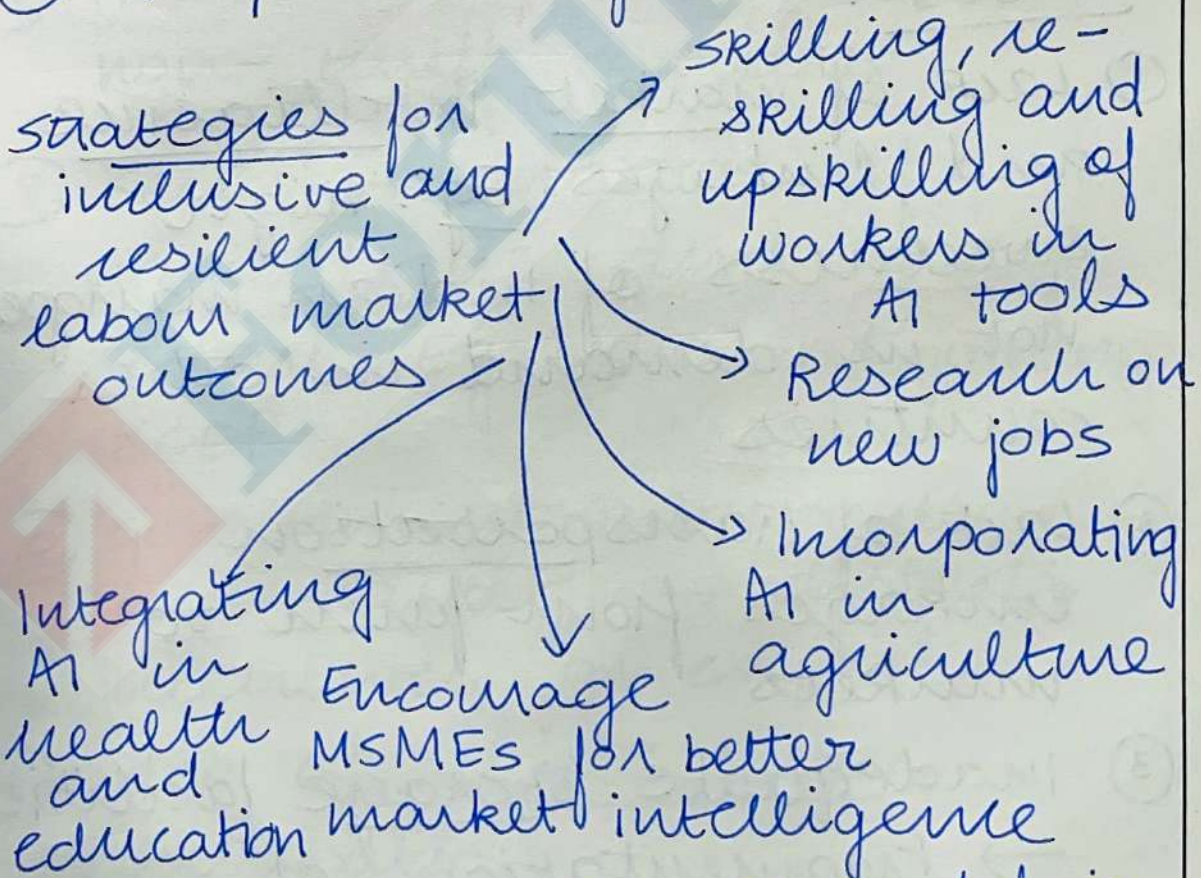
employees over female employees

④ Integration of AI in existing processes : cost consideration, re-imagining work, etc.

⑤ labour market polarisation: Benefits accruing only in skilled segments

⑥ labour market lay-offs

⑦ Acceptance of AI



A human-centric AI model is the need of the hour, as stated by Hon'ble Prime Minister.

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Q13) India has a share of mere 2-3% in global agricultural exports implying under-utilisation of the country's potential.

Reasons for weak performance despite high production levels :

- ① Lack of market intelligence and linkages. Eg. High sweetness of Indian mangoes not in demand in other countries
- ② Lack of transportation linkages from farm to markets
- ③ Inadequate storage facilities → Fragmentation of warehouses, unorganised nature, etc.

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- ④ Poor cold chain infrastructure for preservation of perishables
- ⑤ Uncertainty in government policy. Eg. Export bans
- ⑥ Import restrictions in foreign countries. Eg. Use of sanitary and phyto-sanitary measures
- ⑦ Presence of tariff and non-tariff barriers
- ⑧ sensitive nature of agriculture and dairy sectors. Eg. India not joining RCEP
- ⑩ government intervention in market → distorts incentives for export
- ⑪ lack of private sector contribution
- ⑫ Inadequate emphasis on value addition via food processing

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Measures to improve agri-export competitiveness:

- ① Identification of export clusters unique to each region (one District one Product)
- ② Focus on research and market intelligence in foreign markets
- ③ Investment in infrastructure:
Transportation, storage, distribution, etc.
- ④ Capitalising on new consumer preferences: Natural and organic farming, horticulture, etc.
- ⑤ Integration of technology for better productivity
- ⑥ Extension services to farmers
- ⑦ Organisation of farmers in FPOs, cooperatives, etc.

Agri exports can be increased keeping in mind the spirit of
Foreign Trade Policy, 2023

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Q14

According to Budget 2025-26, food and fertiliser subsidies are budgeted at 2.03 lakh crore and 1.67 lakh crore respectively. Other subsidies include those on power, water, MSP, etc.

Need of reforms to address the distortions caused:

- ① open-ended procurement at MSP
 - ↳ Artificial scarcity in the market
 - ↳ overflowing government godowns
 - ↳ skewed cropping pattern (rice-wheat monoculture)
 - ↳ Environmental distortions: Depleting groundwater, soil degradation, etc.
- ② Fertiliser subsidy

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- ↳ over application of chemicals
- ↳ causing water pollution, reduction in soil fertility, health concerns, etc.
- ↳ Imbalance in NPK ratio (11:7:1) against recommended (4:2:1)

③ Power subsidy

- ↳ over-extraction of ground water
- ↳ cross-subsidisation with high power tariffs for industries
- ↳ Distortion of incentives

However, subsidies are important for agriculture because they:

- ① Provide income security to farmers
- ② Reduce input cost to ensure agriculture remains remunerative

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- (3) Ensure food security
- (4) Fulfills the ideal of a welfare state based on economic justice

Possible reforms:

- (1) Rationalisation of existing subsidies (Ashok Gulati)
- (2) Public investment in agriculture: Infrastructure, R & D, input efficiency, etc.
- (3) Price deficiency payment in place of MSP (Ramesh Chand)
- (4) Encouraging private sector participation: contract farming
- (5) Reducing dependence on state: Agricultural Cooperatives, FPOs, etc.
- (6) Timely revision of existing subsidies in line with market trends.

Empowering our farmers is necessary for an inclusive Viksit Bharat.

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Q15)

Biomufacturing aims at the utilisation of biological products and processes for industrial purposes

Biomufacturing's role in transforming today's consumptive manufacturing paradigm to one based on regenerative principles:

- ① Emphasis on sustainability and environmental friendliness
Eg. Biofertilisers
- ② Utilisation of natural processes in production of goods. Eg. Fermentation to produce wine, yoghurt, etc.
- ③ Avoiding introduction of alien elements in processes. Eg. stem cell therapy

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- ④ Enhancing capabilities of our resources to regenerate
Eg. Bio remediation
- ⑤ Development of technology to sustain life forms Eg.
Vaccines, CRISPR - cas 9, etc.
- ⑥ Increasing productivity of resources. Eg. Genetic
modification of crops,
Artificial insemination in
animal husbandry, etc.
- ⑦ Enhancing domestic availability
of resources. Eg. culture
fisheries

Role of BioE3 Policy in fostering
biomanufacturing in the
country:

- ① Recognises the inter-dependencies between economy and environment

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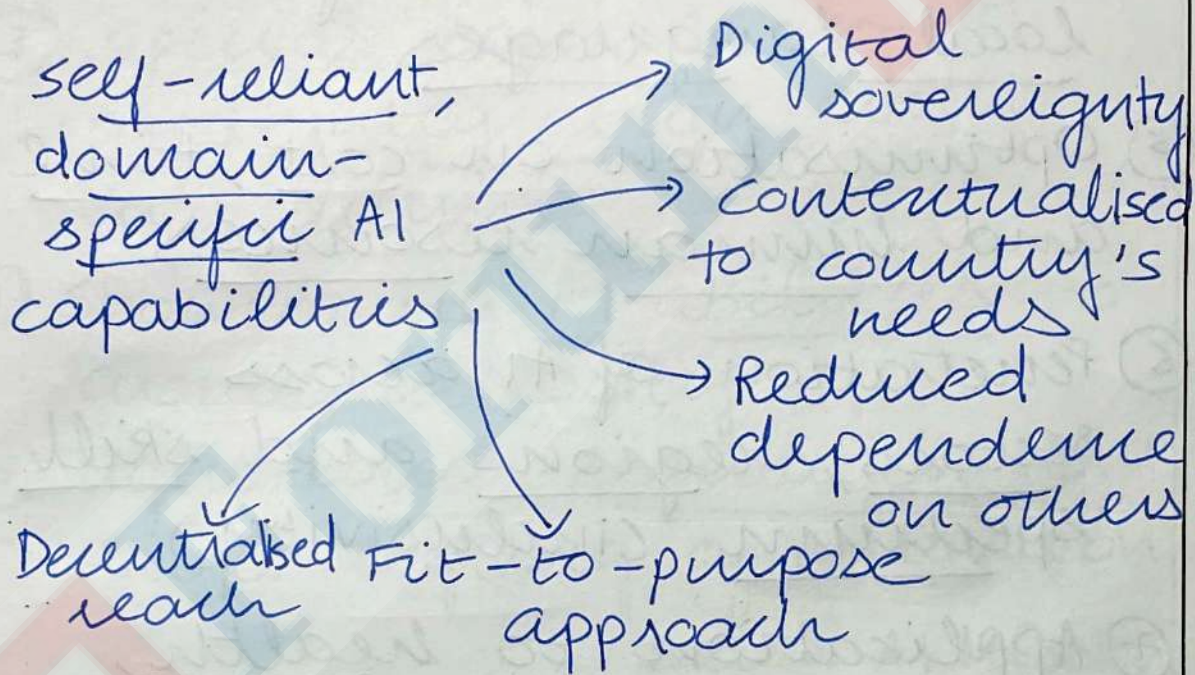
- ② Encouragement to innovative processes
 - ③ Recognises role of R & D
 - ④ Due importance to private sector participation
 - ⑤ Acknowledges role of bio-manufacturing in propelling India's growth.
 - ⑥ creation of employment opportunities across sectors and across the skill spectrum.
 - ⑦ Incentives for industries
 - ⑧ Promotion of a bio-circular economy
 - ⑨ Impetus to health sector
- Biotechnology is poised to become a \$150 billion industry in the next few years.
(National Biotechnology Policy)

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Q16)

AI has become the latest buzz word in global technological, societal and economy discourse with the rise of LLMs such as ChatGPT, Deepseek, Gemini, etc.



Key considerations in developing indigenous AI models :

- ① Foundational models, data servers, etc. developed and based in India
- ② Procurement of GPUs to

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shield India from vulnerability
of supply chains

- ③ Training AI models on accurate, unbiased and robust data
- ④ content availability in local languages
- ⑤ Optimisation on cost, time and human resources
- ⑥ Penetration of AI across sectors, regions and skill spectrum (inclusivity)
- ⑦ Application to health, education, urban and rural governance, etc.
- ⑧ Development of energy sources to back AI technology (Nuclear energy emphasis)
- ⑨ Partnership with private sector in PPP mode

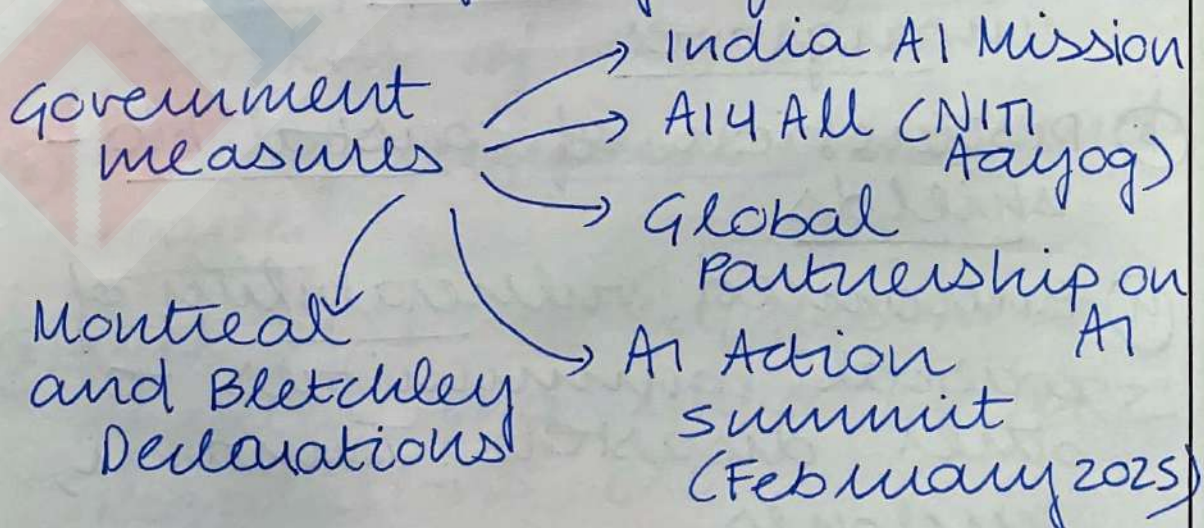
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Measures to build an enabling ecosystem for AI innovation:

- ① Infusion of resources: funds, GPUs, labs, etc.
- ② Hackathons in schools and colleges
- ③ special courses in AI and integration with curriculum
- ④ Showcasing AI abilities to arouse curiosity.
- ⑤ light-touch regulation to avoid stifling of innovation



A responsible, inclusive AI model can trigger exponential Technological progress for our growth.

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Q17) Marine oil spills are caused by anthropogenic factors related to human negligence, technical snags, etc.

Environmental disaster with far-reaching consequences for biodiversity and coastal livelihoods

- ① Hypoxic conditions for marine creatures: Fishes, zooplanktons, phytoplanktons, etc ⇒ death of biodiversity
- ② Damage to corals and mangroves
- ③ Destruction of coastal bio-shields
- ④ Enhanced vulnerability of coastal communities to other disasters: Tsunami, cyclones
- ⑤ land degradation in coastal areas

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⑥ Entry of toxic chemicals in food chains → biomagnification

⑦ Difficulty of removal of oil from vast water bodies

⑧ Poor governance : lack of implementation of coastal zone Regulation Rules

⑨ Disruption of livelihoods and critical infrastructure

Gaps in India's preparedness :

① Unplanned urbanisation and high population density in 2200 km of coastline

② lack of remediation technologies

③ lack of strict enforcement of rules and laws : EIA, CRZ Regulations, etc.

④ substantial infrastructural development close to coastline

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- ⑤ Lack of inter-agency coordination
- ⑥ Inadequacy of funds with state governments
- ⑦ No proper guidelines for operational aspects of ships in India's Exclusive Economic Zone
- ⑧ Poor Accountability mechanisms

Way Forward :

- ① Investing in technologies :
oil zipper, mycoremediation, etc
- ② Learning from best practices of other countries with vast coastlines
- ③ Planned development in coastal areas post risk assessment
- ④ Assignment of responsibilities to local governments
- ⑤ Proper enforcement and investigation mechanisms

Protection from marine oil spills is critical for thwarting risks in coastal areas.

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Q18) According to research, the world's glaciers are expected to lose 50-60% of their ice cover if the world's average temperature rises by 2°C by 2100.

Significance of glaciers

① Ecological

- ↳ sustenance of rivers (lifelines for civilisations)
Eg. Gangotri, Yamunotri, etc.
- ↳ carbon sinks for arresting climate change
- ↳ High albedo to preserve the earth's heat budget
- ↳ shielding biodiversity
Eg. seals, walrus, Penguins, etc.
- ↳ Preservation of freshwater
- ↳ Maintaining the Earth's ecological balance

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② Socio-economic

- ↳ Habitat for local communities
Eg. Eskimos
- ↳ livelihood source : Eco-tourism, adventure tourism, etc.
- ↳ Ensuring freshwater availability to sustain lives and livelihoods downstream
- ↳ cultural significance
Eg. Amarnath and Hemkund Sahib in India

Key challenges in preserving glaciers :

- ① Global warming and climate change triggering melting of glaciers
- ② Unregulated tourism
- ③ Dumping of wastes
- ④ Unplanned development in mountainous regions

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- ⑤ infrastructure development :
Dams, roads, bridges, etc.
- ⑥ seismic activity → glacial
lake outburst Floods
- ⑦ lack of global cooperation
in thwarting & climate
change
- ⑧ Positive feedback loop of
reduced albedo
- ⑨ widespread deforestation
and encroachment.

Measures taken

National

- ① National Mission
for sustaining
the Himalayan
Ecosystem
- ② Winter Expedition
to Arctic
- ③ Research station
'Himansh'

International

- ① Arctic
Council
- ② Antarctica
Treaty
- ③ UNESCO's
Monitoring
System

Glacier Preservation is an
imperative for continued
sustenance of life on Earth.

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Q19.

Insurgency in the north-eastern region poses a significant threat to India's internal security and territorial integrity.

Determinants of insurgency in north-eastern India:

- ① Feelings of disconnect and discontent fuelling alienation and secessionist tendencies
- ② Ethnic and linguistic diversity → Numerous tribal groups
- ③ Perceived neglect by the Union government operating from Delhi
- ④ Historical legacy of colonialism → encroachment on forest land, displacement, etc.
- ⑤ lack of rehabilitation and

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resettlement post land
acquisition

- ⑥ Unabated infrastructure development without due regard to ecology. Eq. Dams
- ⑦ Discrimination faced in mainland India
- ⑧ lack of geographical conne-
-tivity (only via a 22-km stretch of siliguri corridor)
- ⑨ Poor socio-economic indicators
→ health, education, skills, nutrition, etc.
- ⑩ Rugged terrain and inac-
-cessible areas
- ⑪ Repressive role of AFSPA, 1958
strategy to counter the threat
government of India
↳ collaboration among various agencies: state Police, CAPF, IB, etc.

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- ↳ Robust intelligence sharing mechanisms
- ↳ Continuous monitoring of vulnerable areas
- ↳ Repealing AFSPA wherever possible

Civil Administration

- ↳ Trust building with local communities
- ↳ Focus on health, education, employment avenues
- ↳ Cooperation with ADCs and Gram sabhas
- ↳ Implementation of FRA, 2006 and PESA, 1996

Security Forces

- ↳ Restrained use of AFSPA
- ↳ Vigilance along borders
- ↳ Proactive engagement with leaders

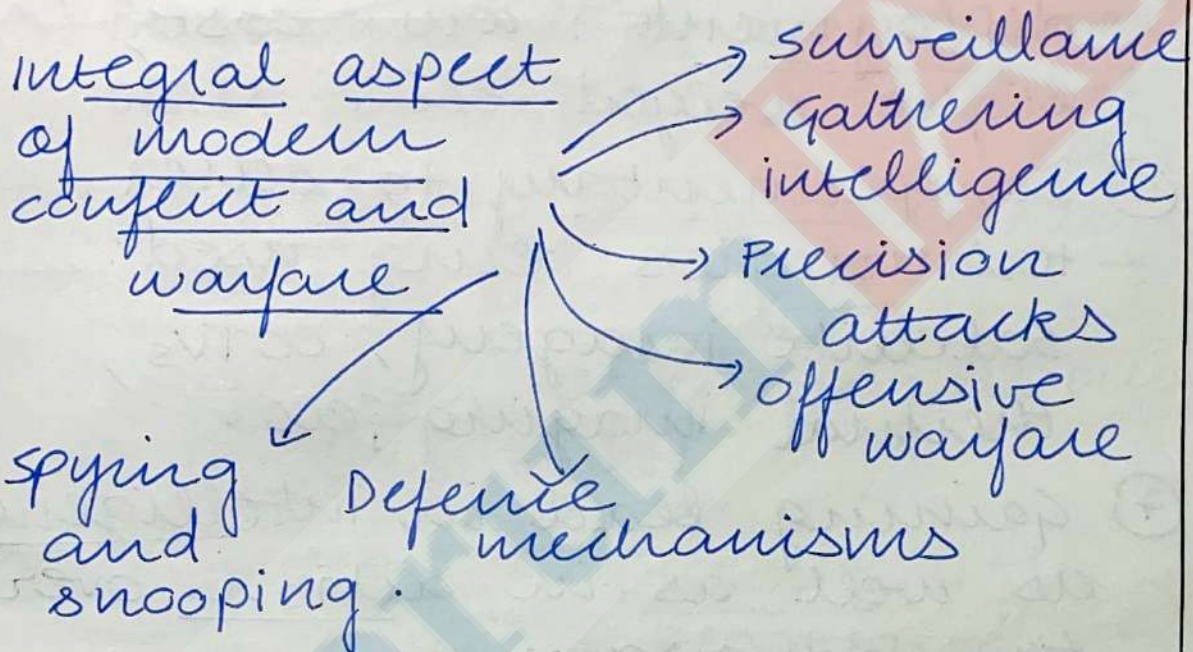
Hon'ble Prime Minister called the North-East a 'piece of India's heart' where prosperity is invaluable.

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Q20

Unmanned Aerial Vehicles are autonomous equipments capable of a variety of functions from an aerial range.



implications for India's security architecture:

- ① Cross-border smuggling and dropping of drugs and weapons by Pakistan
- ② Useful in border management
→ 24x7 surveillance
- ③ Difficult to detect: small size, stealth technology, etc.
→ offensive attacks

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- ④ capability of destroying missiles and foreign intrusive weapons → Defense
- ⑤ Ease of procurement and deployment : low - cost, light weight, etc.
- ⑥ complementary to other technologies being used: satellite imagery, CCTVs, thermal imaging, etc.
- ⑦ Gaining lead in intelligence as well as in action over the adversary.

Measures being taken to address them :

- ① Investment in counter - unmanned ^{aerial} systems (Procurement by Punjab)
- ② Regulatory relaxation in Drone Rules
- ③ Encouraging private sector

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participation in developing
indigenous UAVs.

- ④ Proactive destruction of enemy drones
- ⑤ Procurement of drones from other countries. (USA, Israel, etc.)

other steps to tackle threats emanating from UAVs

- ① Destruction of enemy drones at borders itself
- ② Restricting suspicious UAV activity in a proactive manner
- ③ Investment in R&D to develop cutting-edge counter technology
- ④ Intelligence cooperation with neighbouring countries (SAARC, BIMSTEC)

The changing nature of warfare demands quick action and resilience to new threats.