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UPSC

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Q.1. Agristack Can serve as a foundation to build innovative agri-focused solutions, thus enabling creation of a better ecosystem for agriculture in India. Comment. Also, discuss the concerns associated with it.

Agristack refers to collection of technologies related to agricultural innovations at a single place. It is then made available to the industry for further research & innovation.

Benefits of Agristack

Impetus to
start ups

to find
innovative
solutions

Eg. e-markets
for produce

Increase the
participation
of industry to
raise the income
of farmers

↓
by enhancing
forward & backward
linkages

create an
ecosystem
of R&D
for enhancing
farm
mechanization

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Associated concerns

1. Benefits may not trickle down to the marginalised farmers and may be a reserve for the rich.
2. Adoption of newer technology by farmers may face concerns due to their illiteracy, poverty, etc.
3. IT infra may not be developed at farm gate level owing to digital divide.
→ may result into "high handed" nature of agricultural solutions.

Government recently launched AgriStack to give push to digital infra in agriculture & give end-to-end services to farmers.

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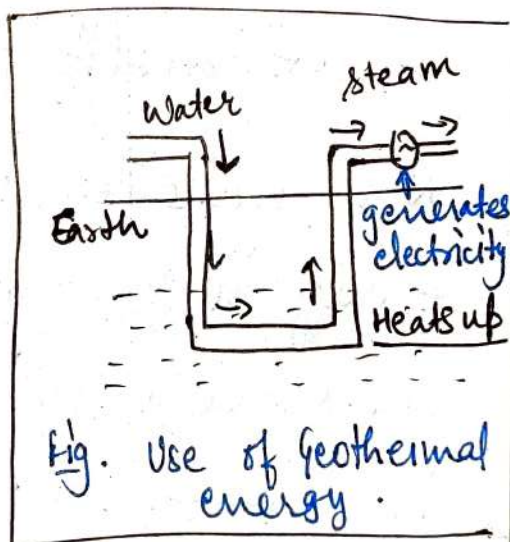
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Q.2. Despite the advantages of geothermal energy, it has not been adopted on a wide scale in India. Comment - Discuss.

Geothermal energy taps the heat energy inside the earth to generate electricity and power.

Advantages :

1. It is infinite in nature owing to heat energy from earth.
2. Can be tapped in remote locations
Eg. Ladakh, Puga Valley, et al.
3. Can be a cheaper source of electricity
→ water is reused, reduces wastage.
4. Carbon free in nature, thus reduces the greenhouse gas emissions.



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Still it has not been adopted on a wide scale, Reasons:

1. Heavy upfront investment cost for energy generation infra.
→ Remote locations are not developed so cost-benefit ratio is not viable.
2. Not available readily at all locations
→ only in few areas such as Ladakh, Son-Narmada-Tapi region, Sohna region in Haryana, etc.
3. R&D is required for enhance efficiency and creation of energy storage infra.
Recent steps have been taken such as creation of energy storage system in Ladakh to effectively use geothermal energy.

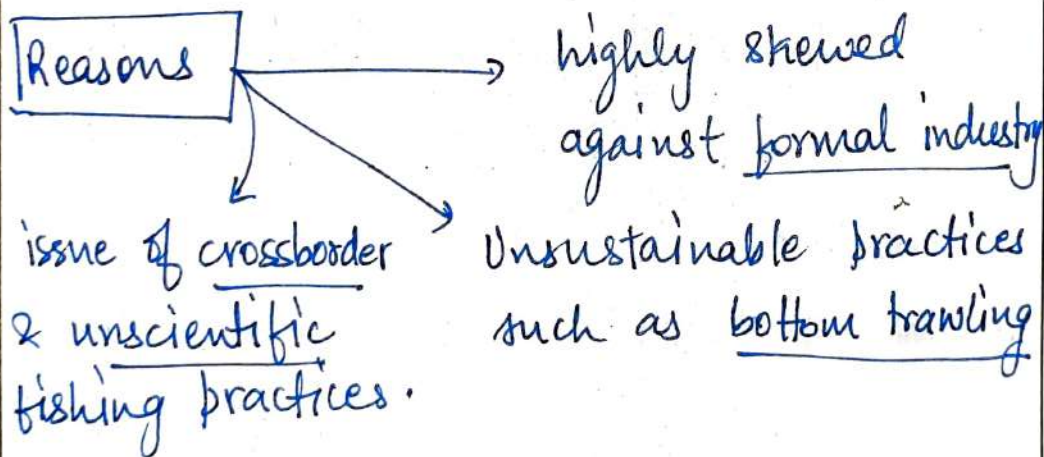
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Q.3. While WTO seeks elimination of subsidies that contribute to IUU (illegal, unreported and unregulated) fishing, there are multiple concerns around it. Discuss while highlighting India's stand on the issue.

WTO, as an international trade body, aims to eliminate subsidies related to informal fishing sector.



Still, it has attracted various concerns. India has been demanding a transition period citing sovereign issues. These are discussed as follows:

I. Socio-Political Issues:

1. Fisheries is subsistence activity of

a large number of communities
and their survival depends on it.

2. Issue of poverty and illiteracy
poses challenge to formalization.

II. Economic

3. The proposed changes would require
huge investments on part of these
communities, raising sustainability
concerns.

4. Subsidies in other forms are provided
by countries such as China, USA,
Canada that make the international
trade highly skewed.

Issues of developing nations
must be addressed while the fishermen
communities be educated regarding
modern practices for amicable solution.

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Q.4. There is a view that current agricultural policies in India are biased against rainfed agriculture. comment. Also, identify government initiatives in this regard.

Roughly 56% of India's agriculture is rainfed. This highlights the vulnerability of agriculture to government policies in this regard.

Policies biased against rainfed agriculture

1. Excessive subsidies for extraction of groundwater such as free electricity to farms, solar pumps under PM-KUSUM.
2. Open-ended procurement via MSP of rice & wheat (which are not usually rainfed). Whereas coarse grains such as barley, maize (which are rainfed) are neglected in procurement.

3. Lack of R2D in rainfed agriculture.

Government Initiatives

1. Recent push for crop diversification towards lentils, coarse grains.

Eg. Haryana's Mera Pani Meri Virasat Scheme

2. Decreasing the dependence on rainfed practices via PM KVVY - Har Khet ko Pani, Per Drop More Crop, Accelerated Irrigation Benefit Scheme, etc.

3. Raising the income of farmers to undertake upgradation programmes. Eg. PM KISAN yojana.

Efforts must be taken to deepen the sustainable irrigation methods such as Drip, sprinklers, etc. for effective use of water.

Q.5. Enumerate the major causes behind marine heatwaves. Also discuss their impact on the ocean ecosystem.

Marine Heatwaves (MHWs) occur when ocean temperatures are warm for an extended period of time. This was seen recently in Western Australian region.

Causes

1. Warm Ocean Currents that can disturb the temperature of ocean ecosystems.
2. Mixing of warm air with water to extend heat transfer. Eg. Interaction between heat dome effect & water bodies.
3. Prolonged El-Nino phenomena, especially in Pacific region.

4. Climate Change and increase in
ocean temperatures.

Impact on Ocean Ecosystem

1. Higher temperature would lead to
higher evaporation, and thereby
higher salinity.

→ would change ocean ecosystem.

2. May result into killing of oceanic
flora & fauna, threatening biodiversity.

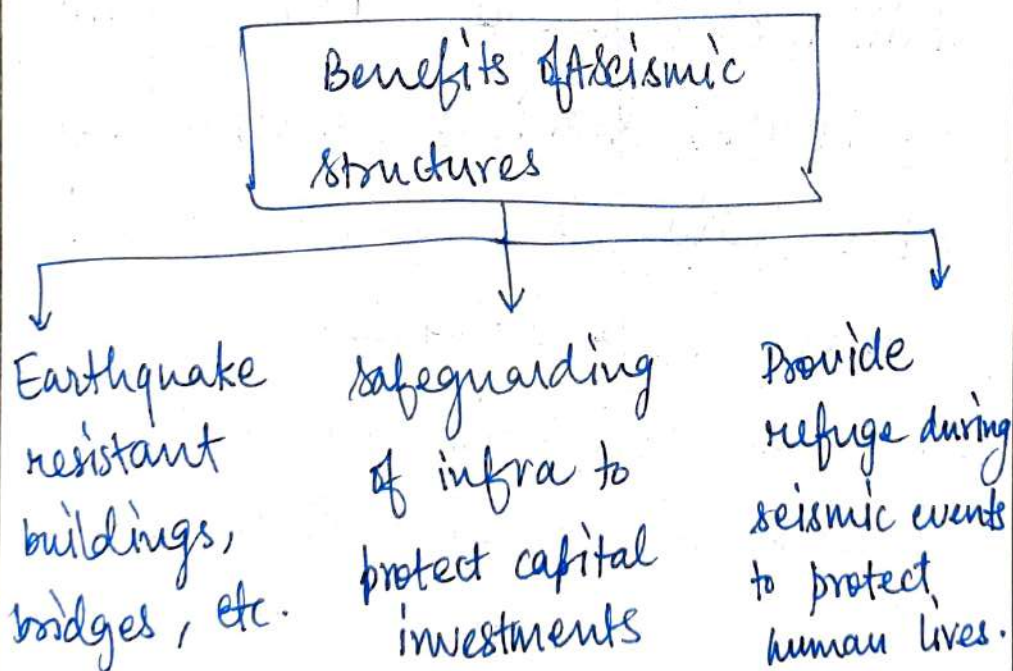
Eg. May result into bleaching & killing
of corals, as seen in Great Barrier
Reef of Australia

3. Would lead to increased ocean
acidification and subsequent damages.
→ lowering of Carbon Compensation Depth.

IPCC's 5th report highlighted
adverse impact of Climate Change into
increasing incidences of MHWs.

Q.6. Aseismic structure are touted as a viable solution to combat earthquake destruction. In this context, highlight the need of a national Program on seismic Retrofitting of Buildings and structures in India.

Earthquakes are natural phenomena that pose threat to human infrastructure & life via seismicity.



Need of National Program on seismic

Retrofitting :

1. Retrofitting would upgrade existing

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infra to become earthquake resilient.

2. India has high vulnerability zones (II, III, IV & V) posing risk to dense population. This would allow to enhance capacity of urban areas.
3. In line with international initiatives such as CDRI (Coalition on Disaster Resilient Infrastructure)
→ Put India as a global leader in relevant technologies.
4. Enhance community preparedness to mitigate impending disasters.
5. Upgrade capability of Indian industry for responsible construction.

Adoption of aseismic structures thus would allow to safeguard human lives and enhance disaster preparedness.

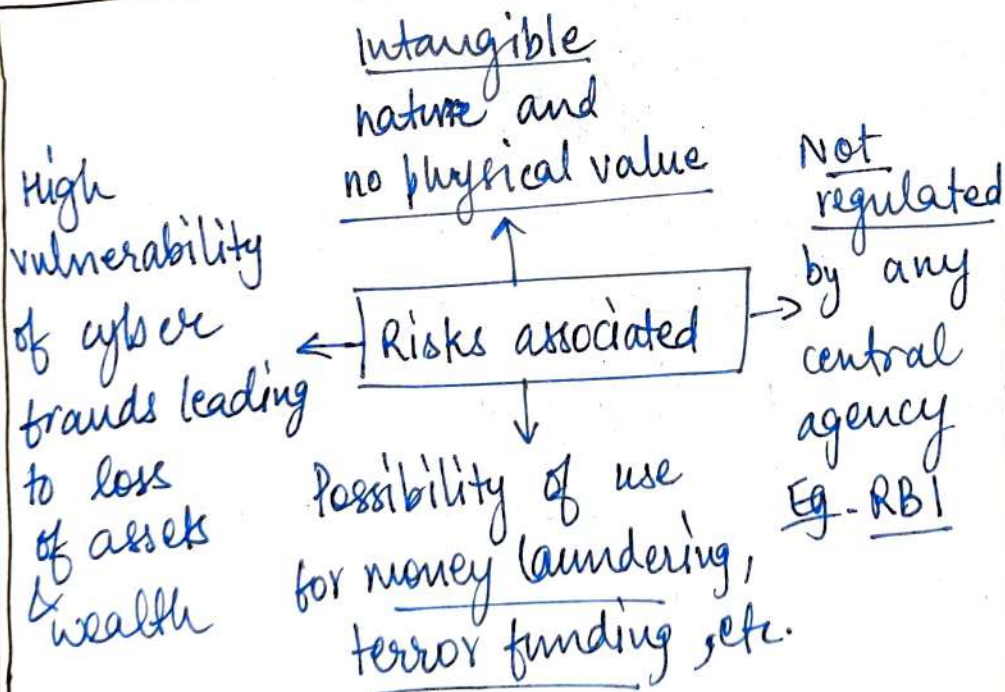
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Q.7 Despite the risk associated with cryptoassets, their underlying advantages should not be overlooked. Discuss.

Cryptoassets is a digital asset that involves cryptography, blockchain technology. It includes cryptocurrencies, blockchain softwares, etc.



Despite these risks, there are multiple advantages to cryptoassets:

1. High return: on investments providing

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possibility of generation of wealth.
Eg. Bitcoin valued \$1 in 2008 and is now ~\$50,000 in 2021.

2. Allows for decentralisation of assets and provides diversification of risks. Eg. Use of peer-to-peer network for ledger tracking.

3. Safeguard Intellectual properties and realise better values.

Eg. Non-fungible Tokens can allow better profits from tribal arts.

4. Security can be enhanced if regulated with proper legislative backing.

Cryptoassets hold revolutionary technology to enhance wealth generation in the future in a decentralised way. It must be regulated for desired benefits.

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Q.8 Virtual Reality and Augmented Reality (VR and AR) have massive innovation potential across a wide range of industries and research fields in India. Discuss.

VR & AR are next-gen technologies that augment multiple avenues for R&D.

Virtual Reality (VR)

Augmented Reality (AR)

Requires use of a headset to experience a virtual landscape of created possibilities.
Eg. Watching movies to experience atmosphere of Mars.

creates digital landscape via use of camera, phones, holograms to integrate landscape with real life world.
Eg. Used in Pokemon-go game.

Potential of VR

1. To test newer scientific technologies in R&D in a virtual format.
→ reduce cost of creating life-like

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models. Eg. Creation of virtual cars instead of clay models in automobile industry.

2. Entertainment Industry can benefit from newer experiences via movies, etc.
3. Defence Industry can benefit by testing of newer technologies.

Potential of AR

1. Help in creating a digital presence for better networking. Eg. Use of Metaverse (from Facebook) like tech in India can revolutionize the telecom industry.
2. AR can allow research in IT industry to provide better insights in SaaS fields (Software as a service).
3. Can allow better visualization of Artificial Intelligence and its benefits.

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Q.9. Discuss the Role and functions of Narcotics Control Bureau (NCB) and examine whether NDPS Act, 1985 needs to be remodelled.

Narcotic Control Bureau (NCB) acts as a premier agency to investigate crime against drugs & narcotics.

Role and Functions :

1. To create deterrence against drug menace and drug peddling.
2. Act as a centre of excellence to fight the crime of drug syndicates.
3. To act as storehouse of information for habitual offenders
4. Investigate drug trafficking and related issue of money laundering.

However, NCB has faced problems in recent times relating to lack of

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Coordination with other agencies, excessive political control, etc.

Need for Remodelling of NDPS Act 1985

1. Rigorous punishment is provided even for smaller possessions of drugs
→ This has led to increased corruption and failed to act as credible deterrent
→ Even used to settle political scores.
2. Dependence on rehabilitation measure is low as it focuses more on the punishment part (treats as a law & order problem)
3. Creates roadblocks in medical usage of certain drugs.

Recently, Parliament passed NDPS (Amendment) Bill 2021 to address these issues for better application of act.

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Q.10. Recent events have raised concerns around the issue of surveillance in India. Do you think surveillance is a necessary evil to tackle crime and terror? Discuss the various arguments on the issue.

Surveillance refers to use of intelligence measures by the state to keep a check on belligerent activities that are harmful for the nation.

Surveillance : a necessary evil

1. India faces plethora of internal threat including extremism, secessionism, sleeper cells, etc.
2. Recent cases of espionage in the age of digital communication have been on the rise. Eg. leak of documents related to Tejas Mk1 from Nashik facility.
3. To deter & pre-empt the threats that pose danger to national security,

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sovereignty, public order, etc.

Possibilities of Misuse

1. can be used to settle political scores by unethical use.
2. May go against fundamental rights of privacy (Article 21) and freedom of speech & expression (Article 19(1)(a))
3. May turn India into a surveillance state. Eg. use of Pegasus software.
4. May alter relations with strategic partners, as in case of Edward Snowden case in USA.

Kautilya in Athashastra highlighted spy network & its utility to ensure public safety. Ethical surveillance with overwatch is the key to regulate the affairs.

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Q.11. The decision to grow a particular crop by a farmer is affected by various factors other than the yield of a crop. Discuss this statement and assess the need for bringing a change in the cropping pattern in India.

Production in India is highly skewed towards Rice & wheat. The fact that water scarce regions of Punjab & Haryana grow these water-intensive crops highlight other factors affecting decision to grow a crop.

Other Factors

1. Availability of seeds, especially the GM varieties. After green revolution, only a few crops have GM seeds.
2. Irrigation methods such as tank, groundwater tubewells, etc. that influence availability of water.

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Eg. Haryana's karnal region grows rice in large quantity with use of groundwater.

3. Government Policies

3.1 Procurement such as MSP policy gives financial security to farmers

3.2 laws & legislations owing to favourability of crops.

Eg. Haryana's Mera Pain Meri Virasat scheme is promoting coarse grains.

4. Market & selling options also influence choice of crop.

Need for change in cropping pattern

1. 56% of agriculture in India is rainfed (as per NITI Aayog). This highlights the vulnerability of farmers & need for crop diversification.



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2. Enhance profits and diversification of risk for better price discovery.

→ Avoid distress selling due to price fall in harvest season.

3. To allow natural replenishment of soil and decrease dependence on fertilizers. Eg. Pulses have nitrogen fixation ability.

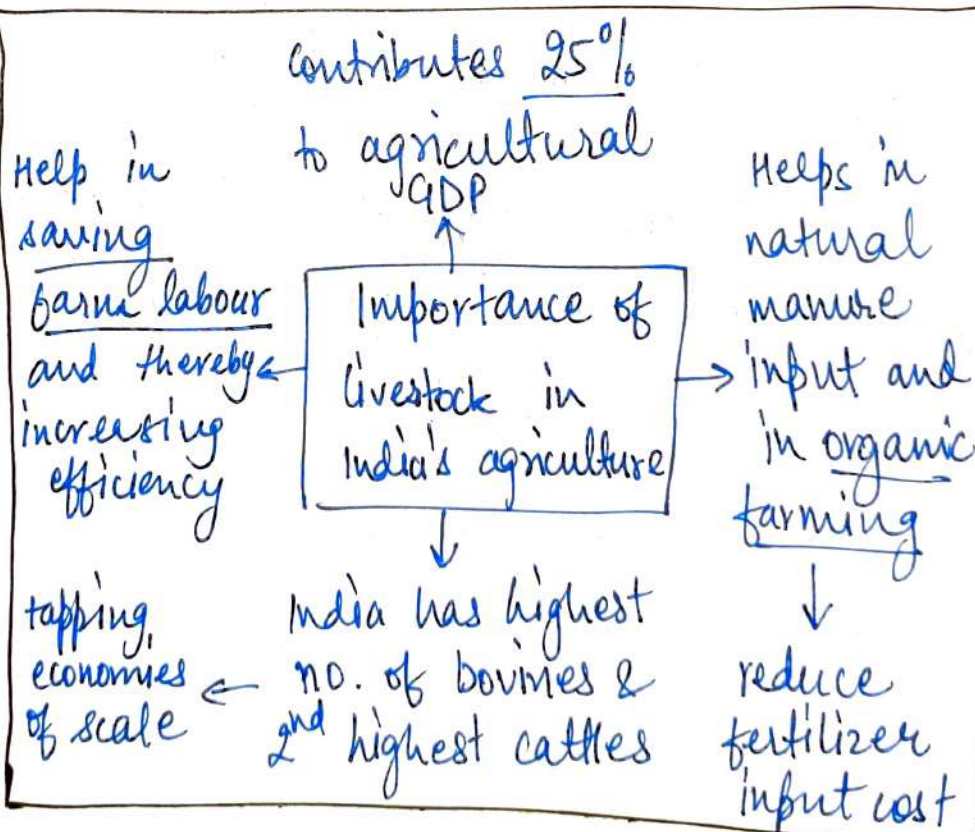
India's agricultural setup needs to move away from "selling what is produced" to "producing what is sold".
This shall allow achieving aim of Doubling of Farmers' Income by 2022.

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Q.12. Identifying the Importance of livestock in the Indian agricultural economy, enumerate the step taken by the government in this regard. Also, discuss the potential impact of climate change on the livestock sector.

Livestock refers to integration of animals in agricultural practices for better productivity.



Owing to this importance, Government has taken various steps

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to boost the sector :

1. National Livestock Mission

- to improve productivity of livestock
- to enhance breeds ~~and~~ based on international standards

2. ~~To~~ Enhanced quality of livestock feed

to better nutrient availability

3. Access to cheaper credit via inclusion in Kisan Credit Card Scheme

4. setting up veterinary care centres and improving availability of doctors

5. National Animal Disease Control

Program to decrease burden of diseases and improve health, boosting profits.

6. Cooperative push to Dairy and allied sectors.

Impact of Climate Change

1. Global warming & decreased availability of water would affect natural health of animals.
2. Increased forest fires would decrease availability of grazing grounds, threatening food security.
3. Spreading of newer diseases such as Anthrax, Blue Tongue disease, etc.
4. Loss of biodiversity would lead to decrease in forage, etc. Eg. Threat to honey bees due to loss of nectar.

Effective care of livestock must thus be kept so as to ensure the aim of Doubling Farmers' Income by 2022 is achieved.

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Q.13: It has been argued by some economist that supply creates its own demand. In this context, discuss the merits and demerits of reliance on investment in infrastructure to boost the Indian economy.

Infrastructure are those capital assets that allow further business activities, such as buildings, roads, etc. It is propounded by World Bank that 1% increase in infrastructural stock leads to subsequent ~1% increase in GDP.

Thus the notion that supply creates its own demand holds true in infrastructural sense. Investment in infra to boost Indian Economy has its own merits and demerits, as discussed:

Merits

1. Increases capital assets and leads to productive use of public money.
2. Helps in boosting subsequent economic activities.
~~Eg.~~ ① Creation of National Highways connect cities & other areas, boosting trade. Roadside eateries come up providing opportunity to earn for locals.
② SEZ allow income through exports and enhance local production.
3. Creates employment at all levels and helps tap the demographic dividend.
4. Creation of business parks led to growth of IT Industry in India.
Eg. In Pune, Bangalore, Gurugram, etc.

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Demerits

1. Funds to be provided for subsidies may be diverted.
→ Ineffective use may lead to increase in corruption.
2. May increase inequalities owing to differential employment opportunities.
→ As seen post 1991 LPG reforms.
3. May lead to unsustainable development.
Eg. Greenhouse gas emissions from cement industry.

Equitable development of infrastructure must be ensured to ~~allow~~ allow benefits to all sections of population. India's Mission Gatishakti aims to invest ₹1 lakh crore to boost Indian Economy.

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Q.14 Innovations emerge not just as an opportunity but also as pre-condition to assure the sustainability of food production. Analyse the statement in context of food processing sector in India.

Food Processing sector is one of the labour intensive sectors holding great relevance for India. It is estimated that ~40% of food in India is wasted on an annual basis.

Importance of Innovation in Food Production

1. To reduce the food wastage and ensure better usage of produce.
Eg. Making of Tomato Puree from Tomato can reduce its wastage.
2. To ensure value addition in agricultural sector and overall GDP.

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- It will allow better profits to farmers
- Avoid distress selling due to unavailable farm gate infra.
- Increase share of agriculture in GDP from present 16%.

3. Possibilities of exports to foreign markets.

- India is among Top 5 producers in most agricultural commodities.
- Model of France to produce wine from Grapes can be replicated.
- Boost employment scenario in India

4. Ensure sustainability in the sector

- by shifting to market-based production and infusing financial prudence
- Decrease the "virtual water export"

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leading to water scarcity
→ Decrease methane emissions as in
case of Gangetic region.

Recently introduced PLI
Scheme in this sector aims to boost
innovation & production in the country.
This would help in upgradation of
whole agricultural ecosystem.



Q.15 The factors contributing the unemployment in India are not merely a result of the structural issue related to the Indian economy. Discuss also, highlight the measures taken to address the problem of unemployment in recent times.

India witnessed ~7% rate of unemployment in 2021. Unemployment is a situation when job seekers are not able to find a suitable job matching their skills.

Factors for Unemployment in India

I. Structural :

1. Owing to bottlenecks in the economy.
2. Government (govt.) schemes leading to inefficiencies.
3. Eg. Industry-academia disconnect based on skills required, etc.

II. Seasonal factors

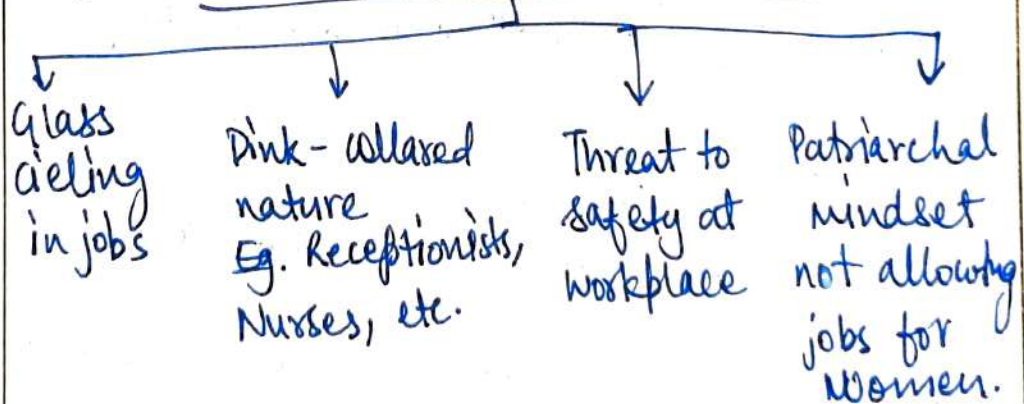
4. Indian economy is dependent on Monsoon & agricultural productivity
→ Agriculture employs ~45% of labour.

5. Recession - Growth cycle of business

Eg. High unemployment post 2008 crises.

III. Socio - Political factors

6. Prohibitions cast on women



7. Lack of skill : ~45% of graduates are unemployable (Aspiring Minds Report)

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Measures taken by Govt.

1. Push for Skill Development via schemes such as PM Kaushal Vikas Yojana, SANKALP, UDAAN, etc.
2. Push for job creation via entrepreneurship & start up via schemes such as Start up India, MUDRA Yojana, Atal Innovation Mission, PM SVanidhi, etc.
3. Push for domestic production via "Make in India" & "PLI Scheme".
→ Focus on labour intensive sectors such as food processing (Mega food Parks)
55% of India's population is below 25 years of age. This demographic dividend holds the key for India's development story.

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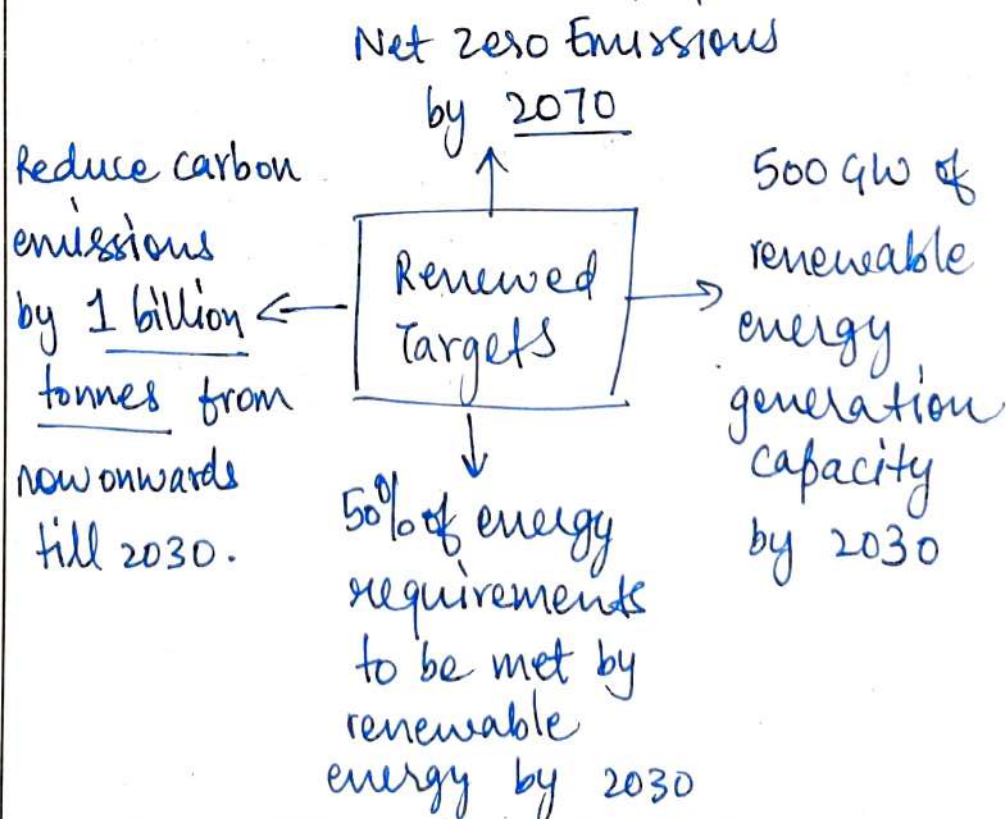
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Q.16. Highlighting the major announcements made by India in the recently concluded COP26, examine India's capabilities in achieving net zero emissions by 2070.

Recently concluded COP 26
Glasgow summit saw India upgrading its Nationally Determined Contributions (NDCs) and stepping up the fight against Climate Change.



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These goals are indeed ambitious and it would require major efforts to achieve them.

India's capabilities in achieving Net zero Emissions by 2030

1. India needs to increase its renewable generation capacity. Present goal of 175GW by 2022 (addition in capacity) is still unachieved.
2. Huge public & private investment is required to tap the resources
→ It is a good thing that India is a tropical country & blessed with resources such as solar energy.
3. R&D is required to upgrade the technological interventions. Eg. Increase

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in efficiency in solar cells.

4. Need to tap diverse sources including
Geothermal Energy, run of the
river projects (Eg. Kishanganga Project),
wind energy, tidal energy in Gulf
of Lambay, etc.

5. Recently introduced National Hydrogen
Mission coupled with private sector's
"India H₂ Alliance" would go a long
way in production of Green Hydrogen.

Achievement of various goals
such as Land Degradation Neutrality
by 2030 (and Bonn Challenge) would
allow India to meet its objectives &
emerge as responsible country in fight
against climate change.

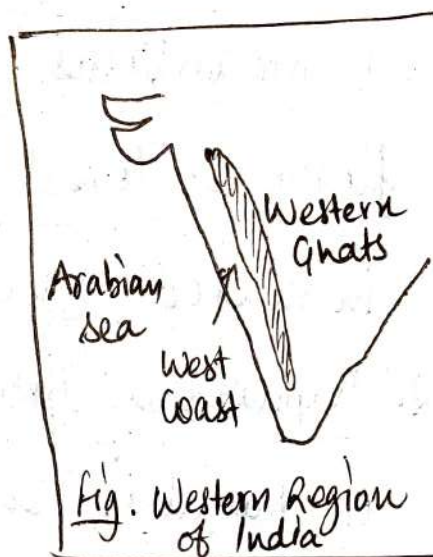
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Q.17. While geography plays a definite role in the recurring disasters in Western Ghats, it is the human intervention that has exacerbated them. Discuss also, suggest measures to protect Western Ghats from these frequent disasters.

Western Ghats region is one of the most bio-diverse region in India. It has recently witnessed disasters such as landslides in Kerala, etc.



Role of Geography

↓
Rugged terrain leading to coastal floods and sand erosion at beaches.

→ Sudden rise in elevation of Western Ghats leading to steep slopes
↓
lead to frequent landslides

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However, it is the human activities that have exacerbated them

1. Encroachments in windward side of mountains. This leads to loss of flora & forest cover leading to increased landslides. Eg. Kerala 2020
2. Haphazard urbanization as in case of Mumbai has led to flash floods and floods during monsoon high tides.
3. Unscientific hydroelectric / storage projects have been theorized as cause for recent earthquake swarms.
Eg. in Palghar region.

Measures as suggested by Gadgil Committee are relevant to

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Protect Western Ghats from disasters :

1. No new unplanned construction in the Eco-sensitive zones to be allowed
2. A bottom up approach to planning to integrate environment in local plans should be made mandatory.
3. No major hydro-storage projects to be allowed in the region.
4. Complete ban on mining, quarrying & sand extraction in eco-sensitive areas.

Strictly following the Coastal Regulation Zones and other provisions is necessary to preserve Western Ghats region from ~~the~~ inundation by disasters.

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Q.18 The IPR regime in India is mired by inadequate protection and ineffective implementation. In this context, discuss how the IPR regime can be made more robust and effective.

IPR regime in India generally follows the "process patent" instead of "product patent". It is also marred by inadequate protection & ineffective implementation.

1. The process of filing patents is cumbersome and highly expensive.
→ This deters the filing process.
2. The infrastructure to protect & manage IPRs are not developed to ensure protection of IPR.
→ Cheap copying, black marketing of

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movies is a prime example.

3. The government machinery to check the misuse along with judicial proceedings are grossly inadequate & time consuming.

Following measures can be taken

to Strengthen IPR regime:

1. Single Window Filing Process to streamline the processes.
→ Decrease the time & funds spent.
2. Upgradation of enforcement infra for effective implementation of laws
3. Strengthening the scientific R&D for technological upgradation
→ Investment in R&D to ~4% of GDP would allow accelerated innovations.

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4. Venturing into new age technologies such as digital tech, Artificial Intelligence, et al would also allow boost the FDI inflows.

India maintains its TRIPS compliance to support the domestic industry. Further interventions related to modern advancements are warranted to give impetus to 21st century innovations in India.

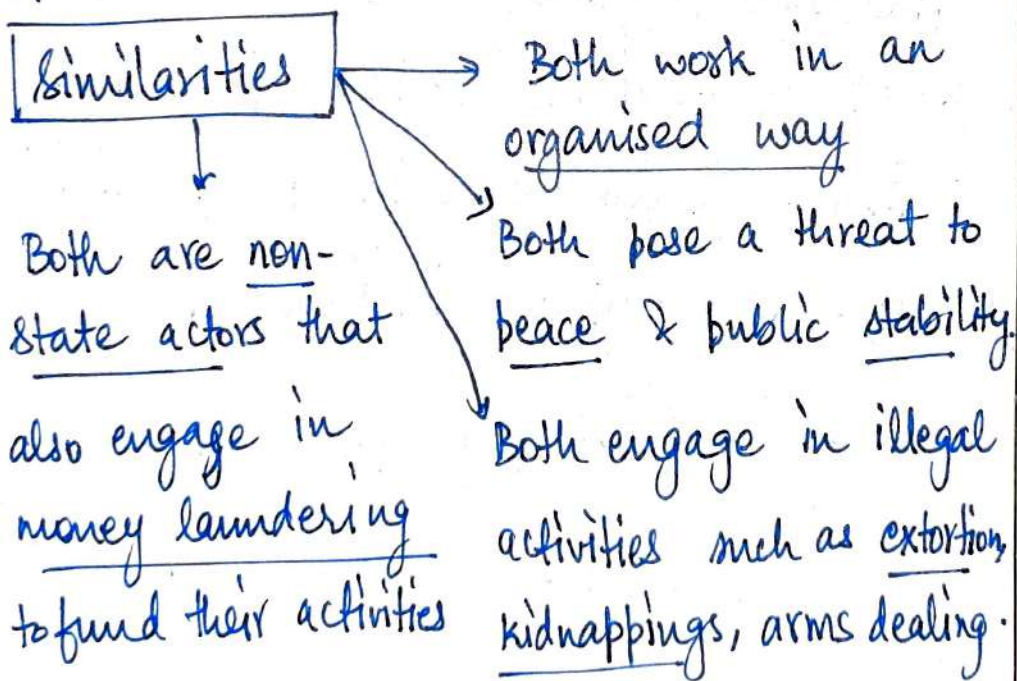
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Q.19. What are the similarities and differences between the activities of terrorists and organised criminal group? Also elaborate upon the fact their linkage occur in both tactical and strategic ways.

Terrorists and Organized Criminal Groups (OCGs) are both threat to security of nation and public order.



Differences

① Terrorist groups aims for political extractions and usually act against

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the state / government.

2. They also resort to lone wolf attacks, hijackings are motivated by extremist ideologies.

3. Eg. JeM, ISIS are terrorist groups.

⑪ 4. OCGs are working on profit & financial motives and usually do not go against state's stability.

5. They usually work in group activities.

6. Eg. D-Company in Mumbai,

human Trafficking groups, Drug Traffickers.

Their linkage usually occur in both tactical & strategic ways, as discussed :

1. Taliban engages in hijackings (IC 814: India) and cultivates poppy

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being part of Golden Crescent to generate revenues.

2. Recently, it has been witnessed that weapons used by these groups are similar. Eg. Assault Rifles.

3. Groups such as Naxalites do blur the boundaries between terrorists & OCGs.

4. Both of these are connected in the way of enjoying patronage of sovereign adversaries. Eg. Pakistan supports JEM & Drug Peddlers in India.

India needs to upgrade its Intelligence & Strategic deterrence to tackle the changing nature of these groups to maintain peace & stability.

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Q-20 There is a view that the 'civil society' is emerging as the new frontier of war; in the 4th generation of warfare. Do you agree with this view? substantiate with logical arguments.

NSA Ajit Doval recently highlighted the role of civil society being used as new frontier of war. It includes general population, civil society groups (NGOs, student unions) among other stakeholders.

This notion is gaining ground as a part of 4th gen of warfare, as evident from following points:

1. Social Media: is being used to spread misinformation among public
→ Recently seen during the CAA-NRC

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protests in 2019.

→ Deepening the faultlines in society by exploiting the mindset of vulnerable sections.

2. Radicalisation is promoted to act against the state's interests

Eg. ① ISIS gaining ground in south India

② Recently, a doctor from Bengaluru was caught who taught self-aid in case of injuries to ISIS cadres.

3. Utilizing sensitive issues of society to promote faultlines in society.

→ Recently motivated sacrilege attempts in Punjab are seen as giving impetus to khalistani Movement

→ The bomb attack in Ludhiana in 2021 was suspected to be funded by ISI.

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4. It emanates from the theory that internal disturbances would tarnish the image of country in international sphere and act as a weapon to inflict damage.

Eg. Use of "toolkit" during the recent Farmers' Protest.

Such new developments of warfare must be closely looked at for ensuring credible deterrence.

Peace in civil society is crucial to maintain peace in country and national harmony.