

Envi PYQs

12 December 2021 15:19

How and to what extent would micro-irrigation help in solving India's water crisis? (10, 2021)

Intro	
Body	
Conclusion	

Explain the purpose of the Green Grid Initiative launched at World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in November, 2021. When was this idea first floated in the ISA? (10, 2021)

Intro	
Body	
Conclusion	

Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the WHO. How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve these revised standards? (10, 2021)

Intro	
Body	
Conclusion	

Describe the major outcomes of the 26th session of the COP to the UNFCCC. What are the commitments made by India in the conference? (15, 2021)

1. Explain intra-generation and inter-generational issues of equity from the perspective of inclusive growth and sustainable development. (10, 2020)

Intro	
Body	<ul style="list-style-type: none"> - Intra-generation = inclusive growth -- define - Issues of equity - poverty, access to resources, inequality, gender/ race/ caste, income, availability & affordability, matter of choice - Intra-generational = sustainable -- define -- Brundtland Report - Issues of equity - using too much now at cost of well-being of future generations <ul style="list-style-type: none"> • EF Schumacher - envi/ envi services are NOT substitutes for economic gr produced by damaging envi (future generation suffers --> drawback of green GDP system)
Conclusion	
	- OECD defines inclusive growth as growth that is distributed fairly across the society and creates opportunity for all.

2. How does the EIA Notification, 2020 differ from the existing EIA Notification, 2006? (10, 2020)

Intro	- EIA = process which predicts the effect of an activity/ project on the environment, by examining costs and benefits. It also considers various alternatives and seeks to identify one with the best combination of economic benefits and environmental standards.
-------	---

	- In India, MoEFCC publishes EIA	
Body	New provisions	Impact
	Reduced period of public consultation hearings to 40 days max	Increase inaccessibility of info to those w/o IT -- forest dwellers, other affected people
	Discretionary powers of Govt extended - can declare 'economically sensitive areas' w/o public hearing or envi clearance.	Decreased accountability, transparency
	Post-facto project clearance	Violates environment jurisprudence Contrary to precautionary principle and sustainable dvpment imperatives
	Extended period of clearances Mining: 30 yrs -> 50 yrs • River valley projects: 10 -> 15 yrs	Project remains unnoticed for long -> increasing risk of irreversible envi, social and health consequences.
	Exemptions to long list of projects from public consultation and prior clearance	
	Baseline data does NOT need to carry out studies covering all seasons in a year	Less reliable data, projections for pollutants Mask full envi impact
	Private consultation allowed	Expertise and technicalities might be adopted to obscure the process; make it incomprehensible
	Reduced frequency of compliance reports from once every 6 months, to once every year	Unnoticed irreversible impacts on envi, social, health
Conclusion	- Weakening of EIA process and implementation has caused industrial disasters at Baghjan Gas Well (Assam) and gas leak at Vishakhapatnam in recent times. - Need to strengthen procedure, maintain process integrity in implementation - Balance EoDB, EoLI with sustainable development imperatives.	

3. What are the salient features of Jal Shakti Abhiyan launched by the Gol for water conservation and water security? (10, 2020)

Intro	
Body	- General features - Conservation measures - Water security measures
Conclusion	

4. Suggest measures to improve water storage and irrigation system to make its judicious use under depleting scenario. (15, 2020)

Intro	Worldwide consumption of water has increased 6x, more than twice the rate of population growth, availability further lowered due to less than 3% being freshwater OECD - water dd would increase by 55% globally b/w 2000 & 2050 Current water storage capacity = 13% of total annual rainfall --- dismal
Body	<u>Water scarcity risks</u> - Social and political risks

- Food security risk -> malnutrition, health risk -> political instability
- Economic risks
 - To sustainable industrial activity -- 30% GDP; water requirement expected to quadruple b/w 2005 & 2030; disproportionate impact on MSME due to higher water prices + water-intensive industries
 - Risk of energy shortage -- 70% of TPPs expected to face high water stress by 2030; TPP constitutes ~80% of total utility power generation & 90% of them rely on fresh water sources for cooling
- Environmental risks
 - Biodiversity destruction -- cumulative impact of climate change, global warming, human engg of hydrological flows (dams, river diversion)
 - Desertification -- extensive groundwater extraction -> loss of vegetation -> desertification + land degradation -> reduced capacity of land to recharge groundwater & regional water tables

Improvement of water storage

- Development of small water harvesting structures -- low-cost farm ponds, nalla bunds, check-dams, percolation tanks, other measures
- Renovation & augmentation of water sources, desolation of village tanks for drinking water/ irrigation/ fisheries development etc
- Afforestation = block plantations, agro-forestry and horticultural development, shelterbelt plantations, sand dune stabilisation
- Pasture development either by itself or in conjunction w/ plantations
- Land development including in-situ soil and moisture conservation measures like contour and graded bunds fortified by plantation, bench terracing in hilly terrain, nursery rising for fodder, timber, fuel wood, horticulture & non-timber forest product species
- Drainage line treatment w/ combination of vegetative and engg structs
- Crop demonstrations for popularising new crops/ varieties or innovative mgmt practices
- Catchment Area Protection under PMKSY, WB assisted Neeranchal Watershed Program

Improvement of irrigation systems

Conclu sion	
	<ul style="list-style-type: none"> - Parthasarathy Shome committee reco on dryland farming - Swaminathan -- Million Wells Recharge program

5. Discuss the benefits of deriving electric energy from sunlight in contrast to the conventional energy generation. What are the initiatives offered by our Govt for this purpose? (15, 2020)

Intro	
Body	<ul style="list-style-type: none"> - Benefits - Economic -- sustainable development; reduce dependence on one source of energy => more robust power infra; - Social -- availability in remote terrains as well; concept of prosumers = income generation - Political -- - Humanitarian -- reduce illegal & rathole mining, reduced displacements - Disasters -- coal mines subsidence, reservoir induced EQs - Geographical -- accessibility in difficult terrains as well

	<p><u>Solar Energy initiatives</u> - NISE - National Institute</p>
Conclusion	

6. What are the key features of National Clean Air Programme NCAP initiated by the GoI? (15, 2020)

Intro	
Body	
Conclusion	

Why in news?
Efforts to tackle air pollution kept the scheme at the centre stage of discussions related to air pollution.

Objective	Features
<ul style="list-style-type: none"> Stringent implementation of mitigation measures for prevention, control and abatement of air pollution Augment and strengthen air quality monitoring network across the country Augment public awareness and capacity building measures. 	<ul style="list-style-type: none"> It is a Central Sector Scheme. It is a long-term, time-bound, national level strategy to tackle the air pollution problem across the country in a comprehensive manner. It targets to achieve 20% to 30% reduction in Particulate Matter concentrations by 2024 keeping 2017 as the base year for the comparison of concentration. Under NCAP, 122 non-attainment cities have been identified across the country based on the Air Quality data from 2014-2018. The city specific action plans have been prepared which, inter-alia, include measures for strengthening the monitoring network, reducing vehicular/industrial emissions, increasing public awareness etc. Implementation of the city specific action plans are regularly monitored by Committees at Central and State level namely Steering Committee, Monitoring Committee and Implementation Committee. Air quality of cities is monitored by State Pollution Control Boards which publishes their results from time to time. Some Smart Cities have established Integrated Command and Control Centres (ICCCs) which are also connected to Air Quality Monitors (AQMs) for effective monitoring.

7. Define the concept of carrying capacity of an ecosystem as relevant to an environment. Explain how understanding this concept is vital while planning for sustainable development of a region. (15,2019)

Intro	<p>? - Carrying capacity of an ecosystem is the extent of damage it can sustain without losing its capacity to regenerate.</p> <p>- the number of people, animals, or crops which a region can support without environmental degradation.</p>
Body	<p><u>Need for planning for sustainable development</u></p> <p>- Private & social marginal costs, benefits diverge -> externalities -> over/ under</p>

- production
- Failure of free market
- Use of envi as a subsidised factor of production in absence of planning -> concentration of polluting economic activities
- Vicious cycle between poverty and envi unsustainability

Relevance while planning for sustainable development

- Helps predict impact of activity and set boundaries
- Adoption of mitigation measures
- Optimise resource utilisation
- Minimise negative externalities
- ? - More

Challenges

- **Determination** of carrying capacity
 - Not directly measurable
 - Approximation methods subject to bias
 - Improper methods -> incorrect estimates -> may aggravate damage
- **Policy design** challenges
 - Actual impact of activities unknown
- **Implementation** challenges
 - Lack of state capacity
 - Inadequate workforce for implementation
 - Wide geographical expanse
- **Monitoring & evaluation** challenges
 - Measuring methods ambiguous
 - Lack of objective criteria
 - Principal-Agent problem

Current measures

- EIA
- ESZ declaration
- Protected areas - NPs, WLS, wetlands
- CRZs
-

Way forward

- Strengthen process, procedure integrity
- Investment in R&D
- Adoption of renewable energy
- Decrease anthropological footprint - pollution, plastics, carbon

Conclusi
on

8. What are the impediments in disposing the huge quantities of discarded solid wastes which are continuously being generated? How do we remove safely the toxic wastes that have been accumulating in our habitable environment? (10,2018)

Intro

- Solid waste mgmt is a major challenge for ULBs in the face of increasing per capita waste generation due to urbanisation, industrialisation and economic growth
- **15,000 tonnes of MSW/ day**
- Only 83% waste is collected; less than 30% is treated

- Projection - 165 mn tonnes by 2030, 436 mn tonnes by 2050

Body

Impediments to disposal to solid wastes

- Economic

- Sorting by unorganised sector -- unsafe and hazardous conditions + low effectiveness
- Urbanisation -- landfill sites in metropolitan cities running beyond capacity
- Inadequate financial support
- Failure of Waste-to-Energy projects

- Social

- Segregation - neither at hh level nor at community bin
- Low status of informal workers in this area -> not vocal in policy formulation

- Informational

- Limited source info about waste hinders appropriate solutions
- Agencies unaware about new methods, technologies

- Policy

- Unscientific disposal in almost all city, town, villages
- Landfill management - non-compliance with rules, functioning beyond stipulated timeline

- Federalism

- Conflict between municipal corporate and state govt regarding new landfill sites
- Lack of coordination among Centre & States -- lack of specific action plans

Some approaches to SWM management

- Landfills

- Thermal -- incineration, pyrolysis, gasification

- Bioremediation

- Bio-methanation

- Phytoremediation-- using mustard (@ Chernobyl)

Removal of toxic wastes

- E-wastes

- Formalise collection of e-waste
- Recycling -- recover valuable metals + save natural resources + reduce pollution
- EPR - polluter pays principle

- Plastic waste

- CPCB - 25000 tonnes/ day
- Circular design and production of plastics
- Promote use for road construction/ energy recovery
- Central Registration System -- for producer/ importer/ owner
- Phase out multi-layered plastic (MLP) -- non-recyclable, non-E recoverable, no alternate use

- Bio-medical waste

- Segregation at source (4 categories)
- Storage facilities - safe, ventilated, secured

- Heavy metals

- Decrease use in fuel, paints, etc

- General

- Data collection - for targeted approach
- Awareness of envi benefits

Conclusion

9. What is wetland? Explain the Ramsar concept of 'wise use' in the context of wetland conservation. Cite two examples of Ramsar sites from India. (10,2018)

Intro	<p>- Wetland are areas of marsh or peatland with water that is static or flowing, fresh, brackish or saline, including areas of marine water with depth at low tide not exceeding 6m.</p>
Body	<p><u>Significance</u></p> <ul style="list-style-type: none"> - Water purification and improving water quality - Stabilise shoreline - Atmospheric maintenance, temperature regulation - Flood prevention and relieving - Water supply - Economic benefits - medicinal varieties, timber, fishing industries <p><u>'wise use' concept</u></p> <ul style="list-style-type: none"> - Ecological character of wetlands should be maintained within the framework of sustainable development - Recognises <ul style="list-style-type: none"> • Developmental activities are inevitable in a wetland (road, power, infra, schools, etc) • Economic activities inevitable • Cruciality of dvp, eco activities for human dvpment -> requires resources - Application <ul style="list-style-type: none"> • Use of water - use but not overexploit for agri and cultivation <ul style="list-style-type: none"> ○ Imposition of legal ceilings on water usage • Use of land - generally try not to divert land for purposes like infra, mining, transportation -- causes ecological damage • Use of biomass - fishing, timber collection -- regulate to avoid adverse effect on regeneration <ul style="list-style-type: none"> ○ Encourage rice-fish mgmt practices ○ Encourage aquaculture <p><u>Issues with wise use</u></p> <ul style="list-style-type: none"> • Open to wide interpretation & potential misuse <p><u>Ramsar sites in India</u></p> <ul style="list-style-type: none"> - Sunderban - Ashtamudi wetlands - Hokera - Chilika lake (largest)
Conclusion	<ul style="list-style-type: none"> - Wetland conservation crucial for protecting biodiversity, mitigating adverse impact of climate change - Maintaining pristine conditions impossible due to poverty, population and development needs, especially in LDCs and developing countries. - Wise use -- notable attempt to strike balance

10. How does biodiversity vary in India? How is the Biological Diversity Act, 2002 helpful in conservation of flora and fauna? (15,2018)

Intro	- 1992 Rio Earth Summit - biodiversity is the variability among living organisms from all sources - terrestrial, marine, other aquatic ecosystems and ecological complexes.
Body	- Variation of biodiversity in India - Species
Conclusion	

11. 'Climate Change' is a global problem. How India will be affected by climate change? How Himalayan and coastal states of India will be affected by climate change? (,2017)

Intro	- UNFCCC: Climate change = change of climate which is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods
Body	- Climate change - global problem - Impact on India - - Impact on Himalayan States - Impact on Coastal States
Conclusion	

Climate Finance

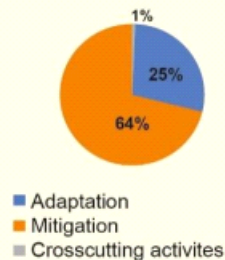
CLIMATE FINANCE AT- A- GLANCE

It refers to **local, national or transnational financing**—drawn from public, private and alternative sources of financing—that seeks to support **mitigation** (reducing GHG emissions) and **adaptation** (adapting to the adverse effects and reduce the impacts of a changing climate) actions that will address climate change.

Status

- ▶ **\$1.6 to \$3.8 trillion per year** required to remain within the **1.5°C to 2°C** scenario. (IPCC report).
- ▶ **~USD 80 billion** of climate finance was mobilised by developed countries for developing countries in 2019.
- ▶ **Asia was the main recipient** of climate finance during 2016-2019.
- ▶ **India will require ~ ₹11 trillion per year from 2015 to 2030**, for effective climate action (MoEFCC).

Share in Climate Finance (2019)



Need of Climate Finance: Investments needed in-

Mitigation

- ▶ Renewable energy generation
- ▶ Green buildings
- ▶ Energy efficient transportation like e-vehicles
- ▶ Decarbonisation of Industries
- ▶ Alternative fuel technologies like biofuels and green hydrogen
- ▶ Restoration of land and forests
- ▶ Carbon capture and sequestration technologies etc.

Adaptation

- ▶ Climate resilient infrastructure such as storm water drains, flood defenses etc.
- ▶ Developing resilient crop varieties
- ▶ Recover from Loss and damage due to extreme weather events
- ▶ Addressing needs of Small Island Developing States (SIDS)
- ▶ Climate Smart agriculture
- ▶ Rehabilitation of vulnerable populations etc.

Existing Sources of Climate Finance

Financial mechanisms under UNFCCC, the Kyoto Protocol and the Paris Agreement	<ul style="list-style-type: none"> ▶ Global Environment Facility (GEF) manages two funds- Special Climate Change Fund and Least Developed Countries Fund. ▶ Adaptation Fund (AF) functioned under Kyoto Protocol. ▶ Green Climate Fund (GCF) aims to mobilise US\$ 100 billion per year.
UN-backed international climate funds	<ul style="list-style-type: none"> ▶ Clean Technology Fund (CTF) ▶ Climate Investment Funds (CIFs) ▶ UN- Reducing emissions from deforestation and forest degradation (REDD) ▶ Net Zero Asset Owner Alliance
Other international funds	<ul style="list-style-type: none"> ▶ Climate Change Fund of Asian Development Bank (ADB) ▶ Forest Carbon Partnership Facility (FCPF)
National and local Sources of raising finances	<ul style="list-style-type: none"> ▶ Allocations from National Governments: e.g., National Adaptation Fund for Climate Change (NAFCC) established by India ▶ Carbon pricing instruments includes mechanisms like- <ul style="list-style-type: none"> ▶ Carbon market approaches like Emissions Trading Schemes ▶ Carbon emissions tax approach

Challenges

- ▶ **Underfunding of adaptation**
- ▶ **Stress added by COVID-19 pandemic:** Diversion to emergency services and reduction in tax revenue.
- ▶ **Lack of 'investment ready' low-carbon/ climate-resilient projects**
- ▶ **Gaps in present global knowledge about climate finance:**
 - ▶ **Lack of common definitions** for central concepts.
 - ▶ **Limited awareness of national policymakers** on the existing mechanisms.
 - ▶ **A scarcity of demonstrable, tested models on climate finance delivery.**
 - ▶ **Low 'bankability' of climate action projects** due to lack of data about future returns and risks on investment.
- ▶ **Lack of adequate finance for least developed countries (LDCs) and small island developing states (SIDS)** to tackle loss and damage.

Way forward

- ▶ **Global efforts:**
 - ▶ **Multilateral development banks (MDBs) and development finance institutions (DFIs)** need to align their portfolios with the Paris Agreement.
 - ▶ **Standardizing definitions of climate finance.**
 - ▶ **Developing additional funding mechanisms to compensate for loss and damage:** e.g., funds that can pool private and public investments from developed nations and global insurance mechanisms.
- ▶ **Efforts at Nation level:**
 - ▶ **Introducing carbon-pricing mechanisms, climate data systems, and criteria for assessing capital investments in green projects.**
 - ▶ **Building Incentive structures and mechanisms,** such as tax rebates, to promote private sector investment.
 - ▶ **Balancing investments in Climate adaptation and mitigation.**
- ▶ **Efforts at the level of Local Governments:** Integrating carbon pricing and other climate-smart metrics into decision making.

12. Rehabilitation of human settlements is one of the important environmental impacts which always attracts controversy while planning major projects. Discuss the measures suggested for mitigation of this impact while proposing major developmental projects. (12.5,2016)

Intro

Body

- Why is rehabilitation of human settlement a major concern/ issues arising out of improper resettlement plans

Mitigation measures

	<ul style="list-style-type: none"> - National Rehabilitation and Resettlement Policy -- to minimise displacement <ul style="list-style-type: none"> • Obj: non-displacing/ least-displacing alternatives; ensure adequate rehab package + expeditious implementation of rehab process; active participation of affected families - Right to Fair Compensation and Transparency in Land Acquisition, Rehab and Resettlement Bill, 2015 -- - Singur judgement - by SC -- inept, illegitimate handling
Conclusion	

12. What are the consequences of illegal mining? Discuss the ministry of environment and forests' concept of "GO AND NO GO" zones for coal mining. (12.5,2013)

Intro	Illegal mining = __
Body	<p><u>Consequences of illegal mining</u></p> <ul style="list-style-type: none"> - Formation of sinkholes - Contamination of soil, groundwater - Loss of biodiversity - Chemical leakage - Risky -- no safety stds followed; rathole -> chances of subsidence/ flooding; <p><u>MoEFCC's Go and No Go zones for coal mining</u></p> <ul style="list-style-type: none"> - No Go = can't mine there under any conditions - Go = mining approved after proper EIA checks <p><u>Benefits</u></p> <ul style="list-style-type: none"> - ESZs can be safeguarded - Preservation of local flora & fauna - Prevent soil/ envi degradation
Conclusion	

13. Give an account of the current status and the targets to be achieved pertaining to renewable energy sources in the country. Discuss in brief the importance of National Programme on Light Emitting Diodes (LEDs). (12.5,2016)

Intro	
Body	<ul style="list-style-type: none"> - Targets for renewable energy - Targets set under INDCs - Solar power - 100 GW - Wind - 60 GW - Biomass - 10GW - Small hydro - 5GW <p>Status</p> <ul style="list-style-type: none"> - Solar - 3GW - Wind - 22 GW - Biomass - 4 GW - Small hydro - 4 GW <p>National Programme on LEDs (too specific, not doing this part)</p>

	(salient features, benefits, challenges)
Conclusion	

14. To what factors can the recent dramatic fall in equipment costs and tariff of solar energy be attributed? What implications does the trend have for the thermal power producers and the related industry? (12.5,2015)

Intro	
Body	<p><u>Factors for dramatic fall in equipment costs & tariff of solar energy</u></p> <ul style="list-style-type: none"> - Technological improvement - ISA -- attracting wide investments from outside - Global economic slowdown and supply glut -> prices of polysilicon reduced - Pledge at Paris Summit to make shift towards renewables + ISA <p>Domestic:</p> <ul style="list-style-type: none"> - Modified tariff policy w/ various exemptions to renewable energy sector - Govt facilitated solar parks w/o any hassle to land acquisitions <p><u>Implications on renewable energy</u></p> <ul style="list-style-type: none"> - Steep drop in prices -> concerns about quality of equipment being deployed - Infra of many solar plants didn't meet many envi stress factors, technical stds <p><u>Implications for TPP & industry</u></p> <ul style="list-style-type: none"> - Decreasing competitiveness - Increasing costs due to imposition of clean energy cess etc
Conclusion	

15. Should the pursuit of carbon credit and clean development mechanism set up under UNFCCC be maintained even through there has been a massive slide in the value of carbon credit? Discuss with respect to India's energy needs for economic growth. (12.5,2014)

Intro	<ul style="list-style-type: none"> - Carbon credit = permit that allows the company that holds it to emit a certain amount of CO₂ or other GHGs. One credit permits the emission of a mass equal to one ton of CO₂ - CDM = UN-run carbon offset scheme allowing countries to fund GHG emissions-reducing projects in other cttries and claim the saved emissions as part of their own efforts to meet int'l emissions targets
Body	<p><u>Benefits</u></p> <ul style="list-style-type: none"> - India major seller of carbon credits - Combines business interests w/ clean energy - Promotes use of clean energy by allowing entrepreneurs to make economic gains from it - Boosts dd for renewable energy <p><u>Why slide in value</u></p> <ul style="list-style-type: none"> - Reduced dd from European markets - Introduction of limits/ caps on buying of carbon credits by various countries like Australia - Japan, major market for carbon credits, have taken steps to meet their industries' dd for carbon credits domestically <p><u>Challenges arising due to slide in value</u></p> <ul style="list-style-type: none"> - Since slide in value, Indian businesses have been holding onto their stockpiles of credits,

	<p>waiting for dd to go up</p> <p><u>What India should do (given our energy needs for eco gr)</u></p> <ul style="list-style-type: none"> - If India implements schemes that can domestically soak up credits generated in India (eg China), would boost trade - Reduce energy intensity of GDP (INDC target to reduce this by 25%)
Conclusi on	

16. Environmental impact assessment studies are increasingly undertaken before project is cleared by the government. Discuss the environmental impacts of coal-fired thermal plants located at Pitheads. (12.5,2014)

Intro	
Body	<p><u>EIA background</u></p> <ul style="list-style-type: none"> - (in prev Qs) <p><u>Environmental impact of coal fired TPPs at pitheads</u></p> <ul style="list-style-type: none"> ➤ During construction -> Change in land use pattern/ site clearing <ul style="list-style-type: none"> - Erosion - loss of biodiversity - loss of change of soil quality & quantity - Huge diversion and acquisition of land in case of power plant w/ captive mine - Dust pollution - Noise pollution ➤ During operations phase <ul style="list-style-type: none"> - Air pollution -- GHGs, NOx, SOx, etc - Waste generation - Water consumption - Mercury & other heavy metals emission
Conclusion	

17. Write a note on India's green energy corridor to alleviate the problems of conventional energy. (12.5,2013)

Intro	
Body	<p><u>What is green energy corridor</u></p> <ul style="list-style-type: none"> - Project for evacuation of renewable energy from generation points to load centres by creating intra-state and inter-state transmission infra - Under implementation - Assistance from ADB Asian Development Bank - Intra-state transmission component being implemented by resp states - PGCIL Power Grid Corporation of India - implementing inter-state transmission component <p><u>Problems of conventional energy</u></p> <ul style="list-style-type: none"> - Localised production -> long distance transport -> high AT&C losses - Increasing dependence on fossil fuel import - GHG emissions -> global warming - Energy poverty in rural areas; dependence on pre-modern energy sources (firewood, cowdung cakes)

	<p><u>How Green Energy corridor solves them</u></p> <ul style="list-style-type: none"> - Reduces cost of transport of renewable energy - Increases competitiveness - Decentralised, distributed generation and consumption <p><u>Challenges</u></p> <ul style="list-style-type: none"> - High setup costs - Low adoption -> no advantage of economies of scale - Green energy may not be completely green <p><u>Way forward</u></p>
Conclusion	

18. Coastal sand mining, whether legal or illegal, poses one of the biggest threats to our environment. Analyse the impact of sand mining along the Indian coasts, citing specific examples. (10,2019)

Intro	<p>UNEP Report 2019 -- 'Sand and sustainability'</p> <p>Issue: Sand has been extracted at rates exceeding natural replenishment rates</p>
Body	<p><u>Status</u></p> <ul style="list-style-type: none"> - Most large rivers of the world have lost b/w 50-95% of natural sand and gravel delivery to ocean <ul style="list-style-type: none"> • Damming for hydel, irrigation -> reduces amt of sediment flowing downstream <p><u>Sand mining threat to envi</u></p> <ul style="list-style-type: none"> - 85% - 90% of global sand dd met from quarries, sand & gravel pits - River & coastal erosion - Threats to freshwater & marine fisheries and aquatic ecosystems - Instability of river banks -> increased flooding, lowering of groundwater levels - China & India -- lead the list of critical hotspots <p><u>Impact on Indian coasts</u></p> <ul style="list-style-type: none"> - TN - fish catch has come down; palm trees dried up; ground water turned brackish; sea has entered villages - Sea water intrusion, inundation of coastal land, salination of groundwater (Kollam, Alapuzha, Kottayam) - Loss of nesting sites for Olive Ridley turtles - Coastal erosion in K'taka - NGT - imposed ₹100 crore fine on Andhra govt for inaction to prevent illegal sand mining <p><u>Way forward</u></p> <ul style="list-style-type: none"> - Better implementation of the enforcement & monitoring guidelines for sand mining - Spatial planning; Reduce unnecessary construction, under speculative projects, etc - Use green infra, adopt recycled and alternative substitute materials (oil palm shell, bottom ash, strictly adhering to CRZ, etc) - Invest in infra maintenance & retrofitting rather than demolish & rebuild cycle - Embrace alternative design and construction methods, even avoiding the use of cement and concrete where possible

	<ul style="list-style-type: none"> - Awareness - Policy level -- <ul style="list-style-type: none"> • strengthen standards; • best practices to curb irresponsible extraction; • invest in sand production & consumption measurement; • monitoring and planning; • establish dialogue based on transparency and accountability
Conclusion	

19. Not many years ago, river linking was a concept but it is becoming reality in the country. Discuss the advantages of river linking and its possible impact on the environment. (,2017)

Intro	<ul style="list-style-type: none"> - 2012 - SC directed Ministry of Water Resources to constitute an experts committee; implementation left to Centre's discretion - Not new -- attempted w/ success in the past <ul style="list-style-type: none"> • India - Beas-Sutlej Link, Periyar-Vaigai link • Int'l - Rhine-Main-Danube canal, Illinois waterway system, Tennessee -Tombigee waterway - India's utilisable surface water by 25% - Will prevent flow of fresh river water into sea
Body	<p><u>Benefits</u></p> <ul style="list-style-type: none"> - 75% rainfall received in 4 months (June-Sep); regionally variable <ul style="list-style-type: none"> • River linking balances water flow across regions - Food security - needs 450 mn tonnes of foodgrains p.a. By 2050 -- irrigation potential of 160 mn ha reqd - Floods + drought -- RLP -- transfer excess water flow from flooded states to water scarce states - Current storage capacity = 30 days of rainfall; dvpd nations have strategic storage of 900 days of water dd in arid areas - - Excessive reliance on groundwater (50% of irrigated area) -- surface water becomes more reliable w/ RLP - Infrastructure for logistics and freight movement - Addl hydropower of ~34 GW expected to be generated - Increase utilisable surface water by 25% - prevent flow of fresh river water into the sea <p><u>Impact on environment</u></p> <ul style="list-style-type: none"> - High cost -- current cost ₹11 lakh crore - Lack of detailed study on feasibility, implications (economic, social, ecological) <ul style="list-style-type: none"> • No engagement w/ local communities - Loss of biodiversity and forests downstream of a donor river - No concept of deficit and surplus in ecology - Desilting issue - Water flowing into sea is not wastage; rather performs important functions - Delta development may be disturbed - Several river pairs part of similar regimes -- no balancing out effect there (Ken-Betwa, Godavari-Krishna) - Impact on neighbouring countries (eg B'desh would be affected by dams in Bhutan) <p><u>Way forward</u></p>

	<ul style="list-style-type: none"> - Exhaust all other options first - rain water harvesting - Sound scientific and technical assessment before large scale implementation - Use better water resource mgmt, encourage small initiatives - Demand mgmt practices
Conclusion	

20. What do you understand by run of the river hydroelectricity project? How is it different from any other hydroelectricity project? (12.5,2013)

Intro	
Body	<p><u>Types of hydel projects</u></p> <ul style="list-style-type: none"> - Run-of-river - Storage - Pumped storage - Offshore <p><u>Run of the river project</u></p> <ul style="list-style-type: none"> - Channels flowing from a river through a canal or penstock to spin a turbine - Generally little/ no storage facility - Provides a continuous ss of electricity (base load) w/ some flexibility of opn for daily dd fluctuations through water flow regulation - 2 specific requirements <ul style="list-style-type: none"> • Substantial flow rate, either from rainfall or melting snow-cap • Enough tilt to the river to speed the water up significantly - Eg Arun-3 hydel project (on Arun River in E Nepal) <p><u>Comparison w/ other models</u></p> <ul style="list-style-type: none"> - Less expensive; can be built faster - Smaller environmental footprint - Significantly lower output; increases the cost per kWh as compared to dam based hydel generation - Manipulation of river flows can cause a significant no of envi impacts affecting the aquatic ecosystem
Conclusion	

21. The Namami Gange and National mission for clean Ganga (NMCG) programmes and causes of mixed results from the previous schemes. What quantum leaps can help preserve the river Ganga better than incremental inputs? (12.5, 2015)

Intro	
Body	<p><u>Namami Gange</u></p> <ul style="list-style-type: none"> - Conservation mission for river Ganga in 2014 - Implemented by NMCG and state counterparts - Maintain minimum ecological flow in Ganga - National Ganga Council under Chairmanship of PM - District Ganga Committee in every district through which Ganga and its tributaries flow - Status - <ul style="list-style-type: none"> • Spent 29% of Sanctioned Budget (₹20,000 crore) and completed 37% of project

- Most project includes sewage treatment plant, out of 152 only 46 completed
- Main pillars of mission
 - Conservation of aquatic life and biodiversity
 - Afforestation
 - Industrial effluent monitoring
 - River surface cleaning
 - Riverfront development
 - Development of Ganga Gram -- model village on banks of Ganga
- Issues
 - Inadequate sewage treatment -- 12000 mn l per day sewage is generated
 - Decreased ecological due to siltation
 - Of coordination among various dept of govt
- Way forward
 - Integration of strategies like river linking, riverfront development, piped water supply etc
 - Restoration of local storage that is pond, lake and wetland
 - Restoration of small tributary of Ganga
 - Organic agri to reduce fertiliser runoff in river

NMCG

- Society under the Societies Registration Act 1860
- Implementation arm of NGRBA National Ganga River Basin Authority (under EPA 1986)
- Currently, 5 tier structure at national, state & district level for prevention, control and abatement of envi pollution in river Ganga
 - National Ganga Council (Chman: PM)
 - ETF Empowered Task Force on river Ganga (chman: Union Min of Jal Shakti)
 - NMCG
 - State Ganga Committees
 - District Ganga Committees in every specified district abutting river Ganga and its tributaries in the states

Conclusion

22. Enumerate the National Water Policy of India. Taking river Ganges as an example, discuss the strategies which may be adopted for river water pollution control and management. What are the legal provisions for management and handling of hazardous wastes in India? (12.5,2013)

Intro

- Water Policy updated in 2021
- Mihir Shah Committee - 'pandemic reinforced conviction of the committee that a major change is required'
-

Body

National Water Policy of India

- Previously in 1987, 2002, 2012; new in 2021 -- not yet released publicly
- Major lesson from previous NWPS = suffered neglect due to absence of a **dedicated mechanism** for their implementation, monitoring and assessment
- NWP proposes shift towards dd mmt
 - Irrigation uses 80-90% of India's water -- mostly in rice, wheat, sugarcane

Status of River Water Pollution in India (CPCB findings)

- 60% of polluted river stretches in 8 states - Maha, Assam, MP, Kerala, Guj, Odisha, WB,

K'taka

- Disproportionate sewage treatment capacity vis-a-vis sewage generation in above 8 states
 - NGT 2019: 100% treatment of sewage
- Increasing BOD in river

Strategies for river water pollution control & mgmt

- CPCB + SPCB -- classified all water bodies including coastal waters in the country acc to their 'designated best uses'
 - Helps set water quality targets, identify needs and priority for water quality restoration programmes for various water bodies
- NMCG, Namami Gange
- Riparian buffers -- vegetated area ('buffer strip') near a stream, usually forested, which helps shade and partially protect a stream from impact of adjacent land uses
- Treatment of sewage water, industrial effluents before release into water bodies
- Regulated use of fertilisers and pesticides to reduce runoff
- Preference to organic farming, use of animal residues as fertilisers
- Bioremediation
- Use of water hyacinth to uptake toxic materials, heavy metals from water
- Cleaning oil spills using bregoli -- by-product of paper industry
- planting eucalyptus along sewage ponds -- absorb surplus wastewater rapidly
- Behavioural change + reorient socio-religious practices (floating dead body, spreading ashes, floating diyas)

Provisions for mgmt and handling of hazardous waste in India

- Hazardous and Other Wastes (Mgmt & Transboundary Movement) Rules, 2016
 - 2019 amendment -- for EoDB, Make in India
 - Salient features:
 - Solid plastic waste prohibited from import into country incl in SEZ, by Export Oriented Units EOU
 - Exporters of silk waste exemption from requiring permission from MoEFCC
 - Electrical, electronic assemblies mfd in and exported from India can be imported back within a year, if found defective
 - Industries not requiring consent under Water & Air Act are now exempted from requiring authorisation under Hazardous Waste Rules too, provided waste generated is handed over to actual users/ waste collectors/ disposal facilities
- Basel Convention on Control of Transboundary Movements of Hazardous Wastes
- PRO - Producer Responsibility Organisation
- EPR Extended Producer Responsibility

Conclusi
on