



IPM / YLM 1.0 TEST SERIES – 2022  
TEST CODE : 16 GS III SYNOPSIS

1. What do you understand by Ecosystem-based Adaptation? How can it be used to reduce climate risks? Illustrate with examples.

**Introduction:**

**Ecosystem-based Adaptation (EbA)** is a **nature-based solution** that harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience to climate change. **The Adaptation Gap Report 2020** places special focus on **Ecosystem-based Adaptation**.

In order to achieve the Sustainable Development Goals, reach global biodiversity targets and effectively address climate change, **nature-based solutions should be treated as integral to adaptation strategies at global, national, and local levels.**

**Body:**



**Fig: How Ecosystem-based Adaptation Works**

**Need for Ecosystem-based adaptation:**

- **To mitigate the environmental impact:** Climate-resilient **coping mechanisms** are being outpaced by the fast-changing climate. Shifting weather patterns as a result of climate change, affecting rainfall and temperature, are likely to impact the ecosystem goods and services on which people rely.
- **To reduce the cost of adaptation:** In response to global climate change impacts, most countries have focussed on **'hard' or 'grey' infrastructure options** such as embankments for flood control or new reservoirs to cope with water shortages. These **options can be costly to build and maintain, and generally do not take the benefits of ecosystem-based approaches into account.**

How it can be used to reduce the climate risks:

#### Dimension 1: Reducing Exposure

- **Protection from erosion:**
  - **China:** a combination of **afforestation, reforestation, and conservation of existing natural forests over 25 years in the Poyang Lake basin halved heavy soil erosion** while increasing net carbon sequestration fivefold and net income for local farmers six-fold.
- **Protection from inland flooding:**
  - **Canada:** reforestation in the headwaters of a river basin **significantly reduced peak stream flows** compared to an adjacent deforested basin, offering greater protection against flooding during spring snowmelt
- **Protection from coastal hazards and sea-level rise:**
  - **Gulf of Mexico:** construction of **'living shorelines'** by aiding natural recruitment of **oyster reefs can reduce vegetation retreat by 40% compared to unprotected sites**, stabilizing the shoreline from the effects of waves and erosion, and increasing abundance and diversity of economically important species.
- **Moderating urban heat waves and heat island effects:**
  - **USA:** daytime air temperature is substantially reduced **with greater canopy cover (greater than or equal to 40%)** at the scale of a typical city block (60–90 m), especially on the hottest days.
- **Managing storm-water and flooding in urban areas:**
  - **Italy:** establishment of **wetlands and green recreational space** has been effective in reducing flood risks, with a **10% higher reduction in downstream flooding and 7.5% higher reduction in peak flow** compared to potential grey infrastructure alternatives. **NbS also outperform grey infrastructure in terms of water purification** and provide greater social and ecological benefits, such as recreation and habitat for biodiversity.
- **Sustaining natural resources in drier and more variable climates:**
  - **Panama:** **agroforestry systems yield up to 21% higher economic return than farm mosaic approaches** (i.e. where trees and crops are on separate parcels), including

under a climate change scenario of more frequent droughts, in models that account for market and climate uncertainty

### **Dimension 2: Reducing Sensitivity**

- **Buffering communities from climate shocks by enhancing and diversifying ecosystem services:**
  - **Zimbabwe:** protection of forested/wooded areas ensures **honey production during droughts**, thereby providing a degree of food security when other crops fail.

### **Dimension 3: Supporting Adaptive Capacity**

- **Governance reform, empowerment, and improving access to resources**
  - **Sri Lanka:** EbA empowered marginalized groups to respond to climate change impacts by **supporting common-pool resource management institutions**, and by supporting local adaptive strategies such as home gardening.

### **Conclusion:**

Nature is “**one of the most effective ways**” of combatting climate change and should be part of every country’s climate strategy. What is needed is to integrate ecosystem-based adaptation measures in the **Environmental policy framework** of the country and **empower communities** to implement those using programs such as MGNREGA, Kudumbshree (Kerala).

## **2. How are the ‘grassroots level interventions’ for water and soil conservation by the government are contributing to sustainable development? Examine.**

### **Introduction:**

Sustainable development needs the use and preservation of natural resources sustainably so that both human development and ecological health are taken care of simultaneously for present and future generations.

- India’s annual per capita availability of water fell from 1,820 cubic meters in 2001 to 1,545 cubic meters in 2011
- As of 2019, 30% of India land is degraded due to various soil-related issues
- This makes it relevant to bring measures that would conserve water and soil for a sustainable future.

### **Body:**

#### **WATER CONSERVATION:**

- A. **Water availability** augmentation is ensured by involving grassroots people with interventions like



- Jal Shakti Abhiyan in which citizen participation is ensured for rainwater harvesting, **renovating traditional water bodies**, etc. increasing water resources
- Developing **micro-watersheds** under schemes like NREGA with the involvement of people

**B. Water-use efficiency**

- **Micro-Irrigation Fund** is established to increase adoption of drip irrigation, sprinkler irrigation, etc. to reduce water wastage,
  - KVKs is promoting **zero tillage technique** and organic farming to conserve soil moisture so that water use in agriculture is reduced
  - Panchayats are entrusted with promoting water-use efficiency and on that basis, they will be given **performance grants** as per Finance Commission recommendations
- Role in sustainable development,
- a. **Water stress** can be diminished by ensuring water availability, accessibility, and affordability. NITI Aayog envisaged by 2030, 821 million Indians will face water stress,
  - b. **Human development** is promoted with the rise in piped-water supply, use of toilets, and related women empowerment
  - c. **Poverty alleviation** with low use of water and increase in income consequently for farmers

**SOIL CONSERVATION:**

**A. Nutritious soil** is ensured with schemes like,

- Soil Health Cards meant to enable efficient fertilizer use
- Neem-Coated Urea technique
- Nutrient Based Subsidy scheme to reduce nitrogen fertilizer use

**B. Moisture-rich soil**

- Parampharaghat Krishi Vikas Yojana to promote organic farming in which soil health is the primary target
- National Action Programme to Combat Desertification focuses **on** improving soil moisture to reduce land degradation by ensuring mulching, zero tillage, etc.

**C. Soil quality** is promoted by eradicating soil alkalinity and salinity which happens as a result of water-intensive crop cultivation. This is done by changing cropping pattern with grass-root level changes through,

- National Horticulture Mission
- Intensive Promotion of Millet's scheme

Role in sustainable development,

- a. **Food security** is ensured with healthy soil since YIELD improves
- b. **Green-house gas emissions** are reduced with low fertilizer usage
- c. **Farm income** improves when yield improves and low-fertilizer farming is done



**Conclusion:**

Sustainable Development Goals **(SDG) 2030 Framework** focus on water (SDG-6) and land conservation (SDG-15) as two crucial sectors for overall economic and ecological health since human survival in a sustainable manner are impossible with water and land.

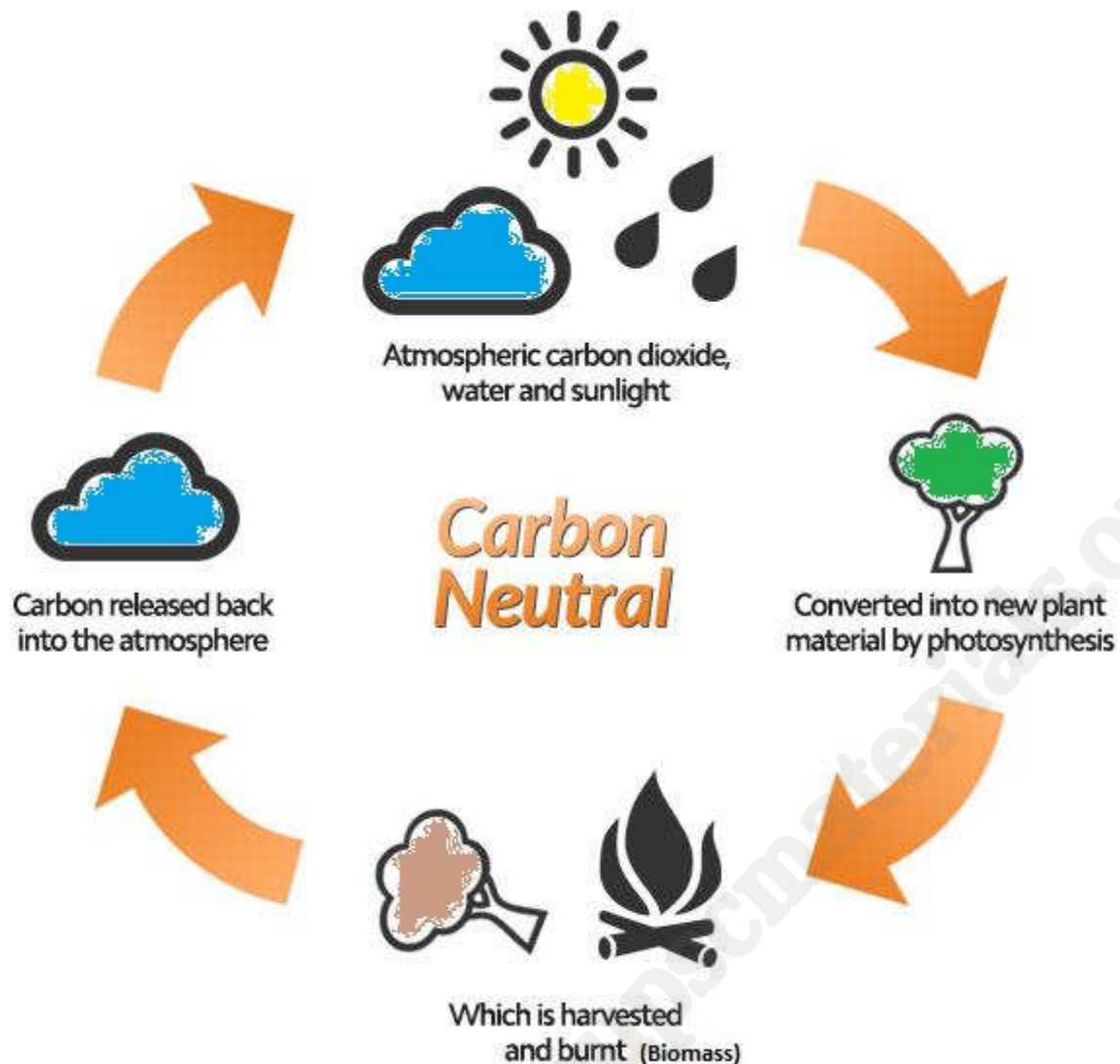
**3. What do you mean by Carbon Neutrality? Will India's Pledge for Carbon Neutrality by 2070 impact the interests of its poorest and vulnerable populations? Comment**

**Introduction:**

**Carbon neutrality** means having a balance between emitting carbon and absorbing carbon from the atmosphere in **carbon sinks**.

At the recently held **COP26**, India announced its pledge of reaching **carbon neutrality by 2070** as part of a **five-point action plan** that included **reducing emissions to 50% by 2030**. However, many analysts fear that adhering to its commitment might compromise its promise of India's efforts to improve the lives of its poor and vulnerable population.

**Body:**



### Yes, India's pledge will impact the interests of Poor and Vulnerable

- **Strong linkage between energy use and development:** India has over 21% of its population below the Poverty line. For their upliftment India requires energy. However, over 70% of current energy is fossil fuel-based. So, there is fear that transformation to renewable energy may not be feasible without hurting the developmental agenda for the poor.
- **Question of Equity and climate justice:** Renewable energy is free but harnessing it is costly. Poor might not be able to afford equipment such as Photovoltaic cells and charging batteries.
  - **Oxfam International's** 2020 briefing '**Confronting Carbon Inequality**' shows that over the past 20 to 30 years, our limited global carbon budget was squandered in the service of increasing the consumption of the already affluent, rather than lifting people out of poverty.





- **Question of job creation:** As per the government, India needs to create **100 million** more jobs by **2030**. However, most of the labor-intensive sector relies on cheap energy sources such as Coal or electricity supplied by thermal power. Transformation to clean energy is costly and our **MSME lacks the capability**.
- **Per capita emission:** Although India is the third-largest emitter of GHG, still its per capita emission is one of the lowest. **Developed countries**, home to **18%** of the global population, are responsible for over **60%** of these emissions. Until there is a substantial transfer of money and technology for clean energy transformation from developed countries, India's pledge may lead to the diversion of resources from its goal of social and economic development.
- **For Women:** There is a need for more carbon space for Women to feed the family e.g. using biomass. Any commitment to limit this space will directly impact their lives as well as the future of dependent children
- **For Tribal:** India's forest dwellers are not only dependent but also the protector of the forest. However, our current laws based on core-buffer strategy treat them as encroachers. Stricter implementation of current laws for meeting India's commitment will indirectly affect the Tribal.

**However, India is projected to be one of the most vulnerable countries from the effects of climate change** including rising ocean levels, melting of glaciers, more extreme weather events, combating GHG will eventually help the poor and vulnerable. The cleaner and greener transition of the economy will not help reduce the health risk of pollution but also create new opportunities for livelihood.

**What is needed is:**

- **Development for All:** The government approach should be the empowerment of communities for cleaner fuel transitions e.g. government subsidizing the purchase of three-wheeler Electric autos will benefit poor
  - E.g. PEHAL scheme giving subsidized cooking gas cylinders to BPL households
- **Strengthening Climate Policy and Governance to meet the needs of the poor:** India's domestic institutions for climate governance needs to keep the poor and vulnerable at the forefront of benefit.
- **Capacity building:** esp. for mitigation and adaptation measures
  - E.g. **India's KUSUM program** provides free solar electricity to farmers as well as help them set up micro-solar farms
  - E.g. creation of a **solar skilled workforce** will help India provide jobs for youth as well as meet its solar targets

**Conclusion:**

Our transition to cleaner fuel is a must and should be sooner the better. However, the principle of differential responsibility must ensure that growth is equitable and that the poor in the country are not denied their right to development in this new energy future.

**4. Environmental security is increasingly being looked upon as a non-traditional security threat. Elaborate with implications for India**

**Introduction**

**Non-traditional security** threats may be defined as “challenges to the survival and well-being of peoples and states that arise primarily out of non-military sources, such as climate change, cross-border environmental degradation, and resource depletion, infectious diseases, etc.”

**Body**

**Reasons on why Environmental security is being increasingly viewed as a non-traditional security threat by nations in recent times:**

- Environmental threats are **increasingly becoming an underlying cause of instability, conflict, and unrest** across many regions in the world. **Ex:** Diversion of transboundary Rivers by China could adversely affect the stability in other countries, Environmental degradation can create refugee crisis between two neighboring countries, etc
- **“Securitisation”** of the environment and **safeguarding their national interest** can be used as a ploy by **developed countries** to gain **greater control** over global **environmental and resource policies**. **Ex:** **Construction of artificial islands by China in the South China Sea, forcing developing countries to adopt more climate change reduction targets at the cost of the country’s economic growth**
- There is a growing realization that a **nation’s ecosystem/environmental interests** could be invaded by foreign **pollutants or even by the depletion of crucial resources** through **activities of other countries** and the potential of such threats to cause **long-term economic, national security, and societal damage**. **Ex:** **Melting of ice in the Himalayas and its impact on India.**
- **Covid-19 pandemic** has also highlighted the need for viewing environmental threats which can pose a significant threat to the **internal stability of a country**

The rapid degradation of the environment because of global warming itself **constitutes a security threat to the quality of life** of not just the **present generations** but also for **future generations**. **Some of its implications on India are given below:**

**1. Economic implications:**

- **Increase in poverty levels.** **Ex:** **The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) notes that climate change and climate variability will**



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**“worsen existing poverty, exacerbate inequalities and trigger new vulnerabilities for the poor**

- **Decrease in agricultural** production will threaten the **food security in the country**
- Insufficient supplies of basic goods for population. Ex: Clean drinking water- Much of North India will be impacted due to this since their water needs are met by the rivers that originate in the Himalayas.
- **Large-scale negative effects on human health.** Ex: 2.5 million deaths occurred prematurely in India due to air pollution (As per UNEP report)

**2. Population displacement:**

- Satellite observations available since the early 1990s show that since 1993, **sea level** has been **rising** at a rate of **around 3 mm per year**
- The **coastal states of Maharashtra, Goa, and Gujarat** face a grave risk from the sea level rise, which could flood land (including agricultural land) and cause damage to **coastal infrastructure and other property**
- Environmental refugees will also increase due to desertification, cyclones, and floods, large-scale industrial catastrophes (Ex: nuclear meltdowns), overfishing of certain coastal areas, etc.

**3. Domestic Problems and Differences**

- **Ethnic divides** inter alia aggravated by **environmentally induced migration**
- **Social divide** inter alia aggravated by economic decline.

**4. International implications:** Rising differences with our **neighboring countries** on the use of scarce resources. **Ex: Water sharing between India and Pakistan, water sharing between India and China, etc**

**5. Biodiversity implications:** Climate change, invasive alien species, ozone depletion will affect the biodiversity system of the country. **Loss** of this **crucial biodiversity** will affect the flora and fauna in the country and also the livelihood of many tribals who depend upon forest resources for their sustenance

**Conclusion**

Environmental security is a new phenomenon that has emerged in the last few decades. Understanding the relationship between environment and security and evolving a comprehensive National Security policy in this regard is important for national security and harmony

**5. Despite India's thrust on Renewable energy, still, Coal is indispensable for India's energy needs. Enumerate the steps that can be taken to reduce the carbon footprint of coal power plants in India.**

**Introduction**

According to Reuters India, India is the world's second-largest coal consumer after China and the

third-largest emitter of greenhouse gases. Coal-fired plants currently account for over half its nearly 373 gigawatts (GW) power generating capacity.

## Body

### Coal power plants

- More than 65% of India's electricity generation capacity comes from thermal power plants, with 85% of the country's thermal power generation being coal-based.
- The ten biggest thermal power stations operating in India are all coal-fired, with five of them owned and operated by state-run National Thermal Power Corporation (NTPC).

### Carbon footprint

It is the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community.

Status of carbon dioxide emission in India

- **India's CO<sub>2</sub> emissions fell by around 1% in the financial year ending March 2020**, which is the first year-on-year reduction recorded since 1982, according to a **Centre for Research on Energy and Clean Air (CREA)**.
- Coal-fired power generation continues to be the single largest emitter, accounting for **30 percent of all energy-related carbon dioxide emissions** according to **International Energy Agency**

### Advancement in technology to remove carbon from power plants

**Carbon capture technology:** Removing carbon dioxide from power plant emissions is ever more urgent to limit the damage from climate change. Chemists have come up with an efficient and less expensive technique for removing CO<sub>2</sub> from natural gas plant emissions. The technique could be tweaked for more polluting plants that use coal.

Steps were taken to reduce the carbon footprint of coal power plants

- **Since 2017, India has commissioned more solar and wind capacity than coal:** Coal power is also more expensive there due to low availability and high transportation cost. The cost of solar and wind power is 30-50 percent less than power from new non-pithead coal plants.
- **Aiming to more energy through renewable:** The renewable energy ministry had said that it was aiming for 523 GW of renewable by 2030, which is over double the country's currently operating coal power capacity of 229 GW.
- **Renewable energy potential:** Karnataka, Rajasthan, Tamil Nadu are states with the highest renewable energy potential in the country. Their installed renewable energy capacities are either higher than coal power or are on a path to overtake it.
- **India sees a consecutive year-on-year decline in coal funding:** 126 percent drop in funding



from the commercial banks to coal compared to 2018.

- **No extra coal power stations until at least 2027:** according to the government's latest draft National Electricity Plan, released by the Central Electricity Authority (CEA) for public consultation, makes no room for further generation capacity beyond the 50GW coal fleet that is under construction.
- **No new coal policy:** Tamil Nadu, Karnataka, and Rajasthan are in a position to declare a "no new coal" policy after Gujarat and Chhattisgarh made major announcements
- **No loan to coal power plants:** NTPC, India's largest coal power operator, recently announced a moratorium on the construction of new greenfield coal power plants. Solar dominated project finance loans to renewable energy in 2017, 2018, and 2019.

### Conclusion

India has pledged to slash the intensity of its fossil-fuel emissions by one-third by 2030 compared to 2005 levels, largely by making a big shift to renewable energy sources such as solar. But initiatives by industry to reduce emissions will also go a long way in contributing to that goal

## 6. What do you understand by the term common but differentiated responsibilities? How has the Paris Climate Agreement influenced this principle and climate negotiations? Critically Analyse.

### Introduction

Common but Differentiated responsibilities **were** adopted in the Rio summit of 1992 and **were** enshrined in the Kyoto Protocol. Under CBDR, the developed and developing nations had different responsibilities to undertake while working towards the common principle of preventing and controlling climate change.

### Body

#### Need for CBDR

- The developed nations are deemed to have historical responsibility as most of the emissions in the past two centuries were caused by these nations and they are under the moral obligation to reduce and control emissions. [Polluter pays principle]
- Further, the developed countries also are responsible for high levels of "luxury emissions" today, seeking to promote a luxurious lifestyle.
- On the other hand, the developing countries do not have any historical responsibilities for polluting the environment.
- The socio-economic developmental needs of the developing countries require them to increase emissions to a certain extent to reach a minimum standard of living. These emissions could add to furthering the climate change in the current scenario.
- The developing countries and the LDCs are most prone to climate change but lack



technological and financial resources to combat climate change. This situation led to the formulation of the CBDR principle. It included

- Reduction in emissions by developed countries recognized under Annex 1 and 2 of the Kyoto protocol
  - Financial measures to developing countries and LDCs for prevention and mitigation of climate change
  - Support for clean development by technology transfer mechanisms
- Issues with CBDR
- The developed nations like the USA were unwilling to provide financial and technical support to the developing nations.
  - An increasing number of nations quit the Kyoto protocol
  - The emissions by developing nations like India and China were very high due to the high population and relatively higher growth rate. Thus the developed nations contended that countries like India and China should be held responsible for emissions

#### **CBDR principle and the Paris agreement**

- Paris agreement was borne out of certain changes in the principles of CBDR
- All emission reductions were to be made voluntary under the INDC norms [Intended Nationally determined Contributions]
- All countries will be placed on equal footing to align to their respective INDCs. This is a major deviation from the principle of CBDR.
- This includes all parties reporting regularly on their emissions and on their implementation efforts.
- It also shifts from financial and technical support for clean development to a more market-based approach towards development.
- Acknowledgment of historical responsibilities has been diluted.

#### **Outcomes of Paris agreement vis-à-vis CBDR**

- With all emission caps being made voluntary, the developed countries cannot be held responsible.
- According to the IPCC experts, all the INDCs put together, will not be sufficient to limit temperature rise within the 1.5-degree limit
- Even a 1-degree rise in temperature cannot prevent the ill effects of climate change.
- By **the abdication of responsibility** - both technical and financial, towards climate change by the developed nations, the LDCs and developing nations like India are now prone to most climate-related disasters and left to the market mechanisms to fend for themselves. Thus, making CBDR irrelevant

#### **Conclusion**

While the Paris agreement has led to developing nations like India taking up moral responsibility towards reducing emissions and promoting clean development, mitigation of climate change is



difficult without responsible actions of the developed nations like the USA. Thus CBDR becomes all the more important and relevant in the current scenario.

**7. India can lead efforts on climate adaptation through Climate diplomacy and draw greater international focus on the adaptation needs of developing countries. Elucidate (10M)**

**Introduction:**

**Climate diplomacy** encompasses the use of **diplomatic tools** to support the ambition and functioning of the **International Climate change regime** and to mitigate the negative impacts of Climate change for peace, stability, and prosperity.

India stepped up its international climate and clean energy diplomacy by establishing the **International Solar Alliance (ISA) in 2015**. India's experience in transitioning to a low carbon economy can provide replicable examples for other developing countries to adapt to climate change.

**Body:**

India has a unique opportunity to set and lead a development-centered, climate, and clean energy agenda by increasing its domestic ambitions and international engagements.

**India's leadership role in Climate diplomacy for Adaptation**

- **Climate Resilient Infrastructure:** - It is estimated that for **every dollar** invested in climate-resilient infrastructure and adaptation measures **means six dollars** are saved. India launched it in 2019.
- **Renewable energy:** - India has launched ISA, **one sun one world one grid (OSOWOG)** to increase international cooperation and adaptation towards cleaner energy.
- **Climate-smart Agriculture:** - India can use its traditional and tribal methods of cultivation as well organic farming (e.g. Sikkim became a fully organic state) to lead the developing world to adapt their agriculture practices
- **Climate finance for Adaptation:** An increase in climate finance has been one of India's key asks at climate negotiations.
  - Internationally, ISA aims to mobilize **US dollar 100 billion** to promote solar energy by 2030 and plans to set up a world solar bank to achieve this goal.
  - India's domestic financial measures such as **carbon pricing instruments, credit enhancement schemes, alternate investment funds**, payment security mechanisms,





and green bonds, etc must be taken at multilateral dialogues to initiate in developing countries.

- **Principles of equity and common but differentiated responsibility:** India is leading the developing world in the adoption of this principle for any future negotiations. India is the only G20 country, whose "**fair share**" climate mitigation targets and subsequent actions are compatible with the goal of limiting the temperature rise to below 2°C by 2100.
- **Maritime security:** - India's SAGAR (security and growth for all in the region) doctrine is the center to develop climate-resilient ports in the Indian Ocean region, an effort that could be steered by climate diplomacy.
- **Neighbourhood First policy:** E.g. India has taken a step toward cooperating with Sri Lanka on climate change. This initiative needs to be pushed further for India to gain an advantage over China, especially in the Indo-Pacific region
- **Disaster management:** - strengthening joint disaster response mechanism by risk identification, awareness, adaptation and mitigation plans, and operating procedures in existing institutions to deploy rapid responses in case of disasters.
  - **E.g. India's Heat Action Plans and Air Information Response Plan**, first of its kind in South Asia, to help protect communities and vulnerable groups from heat waves and incidence of high air pollution.

### Conclusion:

In the coming decade, India can emerge as a **global climate leader** on balancing multiple objectives, such as creating jobs, meeting development and growth objectives, and preventing high carbon lock-ins while adapting to climate change and protecting communities. Thus, ideas of **climate justice** and **Inclusive transitions** should form the basis of a country's climate diplomacy. What is needed today is **mindful and deliberate utilization**, instead of **mindless and destructive consumption**.

8. **Discuss the contribution of Renewable Energy in India's quest for energy security. Also, suggest measures to ensure it.**

### Introduction

**India's energy security** is intricately linked to economic and population growth, accessibility, availability, affordability, and supply and demand. The **primary objective** for **deploying renewable energy in India** is to advance economic development, improve energy security, improve access to energy, and mitigate climate change.

**Body:**

**Renewable energy plays an important role in India's drive for energy security.**

- **India is a global powerhouse of renewable energy:** Despite the Covid pandemic, it managed to cross the **100GW** target installed capacity.
  - India has set ambitious targets of achieving **450GW** of renewable energy capacity by 2030.
- **Competitive Advantage:** Globally, India ranks **fourth** in renewable energy capacity and wind power and **fifth** in solar power capacity.
  - India ranked **third** on the **EY Renewable Energy Country Attractive Index**.
  - Renewable Energy contributes **25 %**(36% including hydropower) to installed power capacity.
- **Huge potential in India:** Solar and wind potential alone estimated at 1050 GW (300GW wind and 750GW solar).
  - **Robust demand:** In June 2021, Prime Minister stated that renewable energy capacity in India increased by **250%** between 2014 and 2021.
  - **Resulting in Rising Renewable Energy capacity:** Total RE capacity has grown **2.5 times** and solar 13 times, since 2014.
- **Achieving Paris commitments:** It is a major driver of **reducing carbon footprints** and achieving Nationally Determined Contribution (NDC) targets under the 2015 Paris Agreement.
  - **To reduce emissions:** by 33-35% from 2005 levels.
  - **Switch to non-fossil fuels:** About 40% of electric power generation from non-fossil fuels by 2030.
- Recently the Prime Minister announced the launch of the **National Hydrogen Mission** on India's 75th Independence Day.
  - **Green hydrogen** can help solve India's twin problems -energy security and decarbonization of its economy.

**Challenges associated with the expansion of Renewable energy in India**

- **Underutilization of renewable energy:** Variable renewable energy (VRE) sources account for 7% of total installed generation capacity, but they contributed **10.7%** of electricity generated by utilities during FY 2020-21.
- **Protective policy cover:** The rapid growth of VRE sources in India has been largely aided by policy measures as well as **financial incentives** whose cost is borne by consumers.
- **The geopolitics of India's neighborhood** does not permit direct access to piped natural gas.
- **Heavy reliance on coal:** India has abundant coal reserves.
  - **Thermal power plants (TPP)** contributed 71% of electricity generated by utilities during FY2020-21. But accounted for only 55% of the total installed generation capacity of 382 GW (as of March 2021).

- **Low per capita electricity consumption:** Per capita, electricity consumption is still only a third of the global average.

### Measures were taken by the government to shift towards Renewable Energy (RE)

- **Policy support:** In July 2021, to encourage **rooftop solar ( RTS )** throughout the country, **notably in rural regions**, the Ministry of New and Renewable plans to undertake Rooftop Solar program Phase 2 which aims to install an RTS capacity of 4000 MW in the residential sector by 2022 with a provision of subsidy.
  - **Ease of business in renewable energy:** Through policies such as transparent bidding, waiving of inter-state transmission system charges, etc.
  - **Market support measures:** Such as Renewable Purchase Obligations (RPO) which made it mandatory for distribution companies to buy a share of power from renewable sources.
  - **Maintaining the sanctity of contracts** through a focus on standard bidding guidelines.
  - Establishing dedicated project development and foreign direct investment (FDI) cells.
  - **Extension for projects** that faced COVID disruptions.
- **Increasing Investments:** India has a liberal foreign investment policy that permits **100% FDI** in the renewable energy sector.
  - **The non-conventional energy sector** received an FDI inflow of US \$10.2 billion between April 2000 and March 2021.
- **Solarisation of agricultural feeders:** The Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (**PM-KUSUM**) scheme aims to enhance farmers' income, reduce diesel use, ensure availability of power and water supply, and reduce the subsidy burden on states.
- **Global Actions:** The International Solar Alliance (ISA) will help countries around the world to align domestic priorities with global sustainability commitments.

### Way Forward

- **Grabbing the opportunity with Make in India:** Over the next decade, about 70% of the global growth of solar energy is likely to be in India, China, and the US.
  - Make in India should **incentivize** and **forge technological alliances** with companies from Japan, South Korea, the US, and Europe.
- **Strive towards greater self-sufficiency:** Fostering the development of **end-to-end clean energy ecosystem** by developing other enabling industries such as wind equipment-making and electrolyser and fuel-cell manufacturing.

### Conclusion

**Sustainable development** is possible by the use of sustainable energy and by ensuring access to affordable, reliable, sustainable, and modern energy for citizens. **India's move towards renewable energy** will provide plenty of employment, business, and investment opportunities.



**Additional Information:**

**Case study: Lessons from China**

- **Quick approvals, incentives, and low costs** have been driving the Chinese solar manufacturing industry.
- It created a huge domestic market and made **technology transfer** a condition for foreign companies to access it.
- **Made in China 2025** plan intends to carry this forward with technological dominance and complete self-sufficiency.

**9. What are Green Buildings? Do you think green buildings can help address the carbon challenge and harness an opportunity for sustainable development in India? Comment.**

**Introduction**

A '**green**' building is a building that, in its **design, construction or operation**, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings **preserve precious natural resources** and improve our quality of life. Long dismissed as being costly, green buildings have seen a **surge in popularity** thanks to the many advantages they have over non-green buildings that range from environmental to social and economic.

**Body**

**Green buildings address the carbon challenge and promote sustainable development. It can help in achieving SDG goal 9 i.e. Industry, innovation, infrastructure, and SDG goal 11 i.e. Sustainable cities and communities.**

- **Energy Efficiency** - Designers of green buildings try as much as possible to reduce dependency on energy from non-renewable sources such as coal. For example, they install solar panels to make use of energy from the sun, and design windows in a way that allows as much natural light as possible and, therefore, reduces the use of artificial light. Thus, energy efficiency leads to sustainable development and also reduces carbon efficiency.
- **Water Efficiency** - Water efficiency involves using water resources in a manner that saves water and ensures that today and future generations enjoy a reliable supply of clean water. Green building allows for the use of alternative sources of water such as rainwater, reducing water waste through the installation of plumbing fixtures that are efficient, and reducing the strain on shared water resources by installing systems that purify water and enable recycling. Thus, promoting sustainable development.
- **Material Efficiency** - Material efficiency involves the use of physical processes and



materials in a manner that allows for the minimum use of materials without compromising the quality of the outcome; also, the processes should generate as little waste as possible. To achieve material efficiency, green building companies use long-lasting materials, recycle and reuse some products, design buildings in a manner that allows for the use of fewer materials and employ processes that use less water, raw materials, and energy. In this entire process, carbon emission is very less.

- **Reduces Strain on Local Resources** - As population increases, local shared resources such as water and energy come under considerable pressure. Through the use of technologies and processes that increase water and energy efficiency, green buildings can reduce this strain.
- **Better Environment** - By reducing the usage of energy sources that pollute the environment such as coal, green buildings contribute to keeping the environment clean. In addition, by reducing the levels of carbon (IV) oxide emitted into the atmosphere, they help to lessen the pace of climate change.
- **Enhances Indoor Environment Quality** - Indoor environment quality depends on conditions inside a building and how they affect the occupants of the building. These conditions include lighting, ergonomics, thermal conditions, and air quality. Good indoor environment quality is one that protects the health of the building's occupants, reduces stress, and improves their quality of life. Green buildings achieve this through the installation of operable windows that allow in as much sunlight as possible and reducing the use of materials that may emit elements that are dangerous to health.
- **Better Health** - People who live in green buildings enjoy many health benefits because of the safety of materials used in the construction of such buildings. For instance, eco-friendly construction companies avoid using plastic by-products that have been found to release toxic materials. Toxic substances like carcinogens not only cause significant breathing difficulties but also increase the chances of getting cancer.

#### Way Forward:

- In India, the growth of green buildings can be accelerated through standardization of norms, better incentive schemes, and a robust financial support system.
- Increased awareness about green buildings and their long-term benefits will surely boost the green buildings sector and lead to the faster expansion of this very vital market segment.
- The growth of green building in India would be driven by increasing awareness, environmental benefits, government's support, subsidies, and compulsions
- Certain steps have already been taken by the government in this regard. Eg. The Bengaluru Smart City Limited (BSCL) has signed an MoU with CII's Indian Green Building Council (IGBC) to give a boost to the Green Building Movement and Sustainable Development





## Conclusion

Green buildings can improve the environment's ecology in numerous ways. It can reduce **energy consumption by 20-30 percent, water usage by 30-50 percent**, and significantly reduce waste generation by extensive recycling.

## 10. India, One of the World's top 3 Methane emitters, and committed to a sustainable future, has decided to stay away from Global Methane Pledge and Forest Conservation Declaration at Glasgow (COP26). Examine the reasons for it.

### Introduction:

In the recently **COP26**, countries pledged to cut down methane emissions by up to **30 percent from 2020** levels by over 100 countries. Also, an ambitious declaration referred to as the **Glasgow Leaders' Declaration on Forests and Land Use** was initiated by the United Kingdom to "**halt deforestation**" and land degradation by 2030 has now over **105** signatories including the UK, US, Russia, and China.

However, India decided to stay away from both initiatives.

### Body:

#### India and Methane Declaration

The top 3 methane emitting countries China (15%), Russia (10%), and India (8.1%) did not sign the COP26 pledge to cut methane gas emissions by 2030.

#### Reasons for staying away

- **Impact on livestock**
  - India has the largest livestock population accounting for **30%** of the world population. It contributes **16%** to the income of **small farm households** as against an average of 14% for all rural households.
  - Thus, reducing methane emissions generated by livestock becomes a major challenge.
- **Impact on farm sector**
  - Agriculture accounts for over **15% of India's \$2.7 trillion** economies and employs almost **half** of the country's population.
  - Methane declaration pressurizes India to reduce emissions which will deteriorate the already debt-ridden farm sector.
- **Impact on trade**
  - India objected to any mention of trade because any commitment to the environment and climate change should not involve any reference to trade as it is ought to be discussed in WTO only as per the globalization norms.

#### Glasgow Leaders' Declaration on Forests and Land Use





India, South Africa, Mexico, Saudi Arabia, and Argentina are the only G20 countries that did not sign the declaration.

### Reasons for staying away

India and other non-signatory countries had argued that **trade falls under the World Trade Organization** and climate change issues shall not be interlinked with trade. Thus they had asked the word “**trade**” to be removed, but the demand was not accepted which became the reason for not signing the declaration.

### India's Commitment to Methane emission control and Forest conservation

- **India's INDC**, to be achieved primarily, by 2030
- India is working to restore 26 million hectares of degraded land by 2030 under **United Nations Convention to Combat Desertification**
- **National afforestation program** for the afforestation of degraded forests lands
- Indian Council of Agricultural Research (ICAR) has developed an anti-methanogenic feed supplement ‘**Harit Dhara**’ (**HD**), to cut down cattle methane emissions by 17-20%
- India is a **partner country to Global Methane Initiative** which provides technical support to deploy methane-to-energy projects around the world that enable Partner countries to launch methane recovery and use projects.

### Conclusion:

To address the issue of global commons we need to follow the principle of **common but differentiated responsibilities** that acknowledges the different capabilities and differing responsibilities of individual countries in addressing climate change. Also, there is a greater need for mobilization of finance (**Green climate fund**), technology transfer, and the importance of sustainable lifestyles for green and inclusive growth.

## 11. Policies of LPG era, indicate an imbalance in maintaining the trade-off between ease of doing business and environmental conservation”. Clarify it.

### Introduction

LPG reforms involve easing of doing the business by removing constraints to business activity in 1993. LPG reforms were meant to overcome economic inefficiencies and attain progress.

In removing constraints to business, various licensing, regulations, and restrictions regarding the environment were removed. On other hand, rising environmental consciousness also brought new environmental measures that stifled economic activity.

The net effect is, there is an imbalance in the tradeoff between economy and ecology after LPG reforms.

## Body

### IMBALANCE—Excess focus on business

#### A. Deregulation of polluting industries:

- Deregulating the coal sector, the petroleum industry has raised air pollution in India. For easing business continuous electricity supply is needed so this sector was not regulated effectively—despite multiple judicial decrees 11 outdated coal plants under NTPC were kept operational to meet the rising electricity demands
- Mining is deregulated now—the private sector can do mining and for various minerals, states are given regulatory power who are notorious to prefer business over ecology. State governments are known to keep environmental regulations less- intensive so that in competition with other states they can attract investments due to comparably more ease of doing business.  
Eg. Sand is a mineral within States' control; thus, sand mining has been left almost unfettered to attract real estate industries which were brought under control only after the Centre's and judiciary's intervention.

#### B. Weakening of EIA process after a point. With time, various industrial sectors have been exempted or given concessions regarding EIA. Even the recent EIA Notification has many dilutions of impact assessment eg. Hydroelectricity, cement, some chemical industries were exempted from mandatory public consultation. Also, for many projects, annual reports needed are one instead of two.

#### C. Diluting restrictions on encroachment,

- Initially, the natural resource was protected from encroachments by economic activities like housing
- Now Wetland Management Rules 2018 man-made wetlands from regulation to ease industrial activity
- New Coastal Regulation Zone Rules 2019, has reduced the size of no development zone from 200 meters to just 50 meters in high populated areas and there is no NDZ for islands now.

These dilutions with time have put pressure on natural resources.

### IMBALANCE—Excess focus on environment:

While the post-LPG era showed a tendency to prefer business activity at the cost of the environment, there were also excessive and abrupt environmental regulations that affected businesses badly. It included,

#### A. Judicial pronouncements were underplaying the economic factors in adjudicating many cases—closure of many industries which created suspicion among investors especially FDI, and abrupt cancellations of coal block allocations. These have converted viable projects into NPAs.



- B. **Renewable Purchase Obligations** which force DISCOMs to purchase renewable energy are appreciable but DISCOMs were already making losses which were put to further economic stress.
- C. **NGT** was established to adjudicate environmental cases but their judgments were considered over conservative eg. sudden ban on diesel vehicles for 10 years in Delhi
- D. **Basel-VI norms and E-Vehicles mandate** have affected automobile industries since neither gradual implementation is done nor considerable financial support is given.

In this way, there is an imbalance in the trade-off—one sector is focused at the cost of the other.

On one hand, the economy is plagued with NPAs, poor investor confidence which affects the economy causing poverty and unemployment. On other hand, India has the most polluted cities, high water stress, etc.

Both ways sustainable development is endangered. Experts have opined that, viewing economic development as GDP growth rather than as well-being of all made economy and ecology conflicting sectors.

#### **Suggestions:**

- Instead of ad-hoc and reactive measures, a long-term plan should be followed to enable businesses to become compliant with environmental regulations eg. gradual introduction of e-Vehicles along with state support for both producers and buyers
- NGT panel should have an environmental economist who would balance both the sectors
- EIA process should be made effective and stronger so that a project in a later stage is not abruptly canceled instead of rejecting it in the budding stage. This needs amendment to 2020 EIA Notification, public participation, annual reporting, etc. should be made more stringent.

#### **Conclusion**

When economic development is considered the well-being of all, it needs a healthy environment thus **economy and ecology are mutually interlinked**. The policy-making discourse needs to recognize this and changes in line with the aforementioned suggestions should be incorporated in future policies and regulations to achieve the balance.

## **12. Critically examine the measures taken by India in recent times to mitigate the negative impact of climate change**

#### **Introduction**

According to IMD data, India's average temperature has already increased by around 0.7 degrees Celsius during the 1901–2018 period due to greenhouse gas emissions and by the end

of 2100, it is expected to rise by approximately 4.4 degree Celsius.

## Body

### Negative impacts of climate change

- Physical impacts- precipitation, temperature, heat waves, tropical cyclones, flooding, drought, wildfire,
- Impacts on temperature- global warming, rising sea level
- Impacts on Biodiversity- loss of wild life, flora and fauna, marine biodiversity, wetlands
- Impacts on human beings- food security, water security, depletion of health, migration of people.
- Irreversible changes- bleaching in reef ecosystems off Lakshadweep and the Andamans, Air pollution-causing irreversible damage to India's urban children

### Measures taken by India in recent times to mitigate the negative impact of climate change

**Regarding climate change mitigation, the country has three major commitments:** These are reducing industrial carbon intensity by 35 per cent in comparison to what it was in 2005, ensuring 40 per cent of its electricity comes from non-fossil fuels and achieving 2.5 billion tonnes of CO<sub>2</sub> sequestration through tree plantation. India has to achieve all these targets by 2030.

### National Action Plan on Climate Change (NAPCC)

1. As a part of the NAPCC, the Indian government had launched 8 missions on focused areas. They are:
  2. National Solar Mission
  3. National Mission for Enhanced Energy Efficiency
  4. National Mission on Sustainable Habitat
  5. National Water Mission
  6. National Mission for Sustaining the Himalayan Ecosystem
  7. National Mission for a "Green India" Goals
  8. National Mission for Sustainable Agriculture
  9. National Mission on Strategic Knowledge for Climate Change
- **National Action Programme to Combat Desertification:** India is one of the parties of UNCCD. The Ministry of Environment, Forest and Climate Change is the National Coordination Agency for the implementation of the UNCCD at the national level.
  - **REDD+:** Reducing Emissions from Deforestation and Forest Degradation (REDD+) is a mechanism developed by Parties of the UNFCCC. It creates financial value for the carbon stored in forests to offer incentives for the developing nations to reduce emissions from forested lands and invest in low-carbon paths.
  - **Paris Agreement:** Under the 2015 Paris Agreement, India set three major goals to be achieved for the period between 2020 and 2030—increase the share of non-fossil fuels to



40% of the total electricity generation capacity, to reduce the emission intensity of the economy by 33 to 35% by 2030 from 2005 levels, and to create additional carbon sink of 2.5-3 billion tonnes of CO<sub>2</sub> equivalent through additional forest and tree cover.

- **National Electricity Plan (NEP):** India has emerged as a global leader in renewable energy, where investments top those into fossil fuel. After adopting its National Electricity Plan (NEP) in 2018, India remains on track to overachieve its “2°C compatible” rated Paris Agreement climate action targets.
- **Faster Adoption and Manufacturing of Electric Vehicles:** On transport, the Faster Adoption and Manufacturing of Electric Vehicles in India scheme came into effect in April 2019, and provides incentives to purchase electric vehicles, while also including provisions to ensure adequate charging infrastructure.
- **Energy efficiency in industry:** The main instrument to increase energy efficiency in industry is the Perform, Achieve, and Trade (PAT) Mechanism, which is implemented under the ‘National Mission on Enhanced Energy Efficiency’. PAT resembles an emissions trading scheme (ETS) and has been in place since 2012. The scheme is currently in its second phase (2016–2019). PAT differs from traditional cap-and-trade systems as it sets intensity-based energy targets
- **The compulsion for BS-VI Vehicles:** emission standard is the sixth emission norm in the sequence in terms of reducing pollution as compared to retiring the BS4 emission standard.

#### Flaws with measures taken by India to mitigate climate changes

- **Fragmented and Outdated Policy:** India is a “dualist” system, which means that international agreements (such as the Paris Agreement and the UNFCCC) must be translated into domestic law to become enforceable within the country.
- **India’s NDCs:** India is far from meeting its NDCs goal of carbon sequestration and afforestation. India’s second Biennial Update Report submitted on 31 December 2018 (UNFCCC 2018), indicates that India’s carbon sequestration from forests has, in fact, worsened from its 2010–14 levels.
- **NAPCC:** Lack of defined objectives, dedicated implementation machinery, and adequate funding are issues with NAPCC. India’s National Action Plan on Climate Change has been slow to start and its sectoral missions are not aligned with the schemes the government has announced to tackle climate change. The technical documentation of the NAPCC mentions that legislation may be required at the central and state level to arrive at the appropriate delegation of responsibility and authority for meeting some of the goals of the policy
- **Vision for climate change adaptation and mitigation across sectoral legislations and policy documents is conspicuously absent:** Individual legislations such as the Wildlife Protection Act, 1972, the Water (Prevention and Control of Pollution) Act, 1974, the Forest (Conservation) Act, 1980, the Air (Prevention and Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 depend on a number of governmental departments and





specialized regulatory institutions, including central and state-level pollution control boards, the central and state-level environmental ministries, and specialized central and state-level regulators.

- **Impact of thermal and solar power projects:** Communities in water-stressed areas in India are likely to be affected by the water demands of thermal power plants as well as solar power projects.

### Conclusion

India strongly needs a comprehensive policy document with a new vision (if not integrated national legislation) to guide it forward in responding to the rapidly closing window against climate change. The role of villages, cities, and states in co-creating India's climate policy must be explicitly endorsed and promoted. Simultaneously, the Parliament, state legislatures, and courts must carefully re-examine the existing policy framework through the lens of climate change, and revise the framework, as necessary.

13. **Discuss the possible role women can play in the sustainable conservation of the environment. Also, list some of the challenges hindering their participation in Environmental conservation.**

### Introduction

**Ecofeminism** analysis explores the connections between women and nature in culture, religion, literature, and iconography, and addresses the parallels between the oppression of nature and the oppression of women in India's Chipko movement in the early 1970s, the Green Belt movement in Kenya later that same decade, women's participation in the anti-nuclear, pro-environment movement in the West in the 1980s and 1990, and similar movements which were themselves unique but also collectively shaped the central philosophy of ecofeminism

### Body

#### Role of women in the conservation of the environment

- In the **developed countries** the issues that women are raising are largely related to pollution and the urban context.
- In **developing countries**, the issues are linked to livelihood concerns in rural areas.
- **At the family level, women's role is detrimental:** Women play a critical role in managing natural resources on family and community levels and are most affected by environmental degradation.
- **Women conserve nature:** In communities around the world, women manage water, sources for fuel, and food, as well as both forests and agricultural terrain. From the high level to the grassroots, the 1992 UN Earth Summit, India's Chipko movement, and Kenya's Green Belt Movement all highlighted the role of women's voices and perspectives in sustainable





development.

- **Women are more empathetic:** Having a more empathetic and reciprocating relationship with the environment and rejecting the capitalist exploitation of nature is supported by ecofeminism.
- **Foundational values of women are good compared to men:** Foundation of Ecofeminism is the notion that a woman's ethics are more closely related to the environment in comparison to those of a man. For example, the female tendency to be a giver and gentle is echoed in nature's qualities to provide everything necessary for survival.
- **Women by nature nourish:** They contend that women have a more intimate relationship with nature because of their gender roles (e.g., family nurturer and provider of food) and their biology (e.g., menstruation, pregnancy, and lactation).
- **Spiritual and religious orientation:** The role of women also has roots in nature-based religions and goddess and nature worship as a way of redeeming both the spirituality of nature and women's instrumental role in that spirituality.
- **The efficiency of resource use effect:** Studies have shown the possibility that women use resources more efficiently than men. This could mean anything from making more productive use of loans of money earned to the ability of women to achieve higher values of output based on cropping patterns.

#### Examples for women-led conservation of the environment

- **Navadanya Movement:** Vandana Shiva is an environmental scholar and activist who campaigns for women in India as well as around the world. Vandana Shiva is also an active voice for localized, organic agriculture. She began a movement entitled Navdanya where participating Indian farmers have created 'freedom zones' to revitalize an organic food market in India.
- **Dakota Access Pipeline protests:** it was an opposition to the construction of the Dakota Access Pipeline in South Dakota.

#### Challenges hindering the participation of women in conservation efforts in the society

- **Women are underrepresented:** Women across the world are underrepresented in decision-making positions related to environmental and sustainable development issues.
- **Barriers to raising voice:** Cultural and logistical barriers don't allow women to voice their needs, knowledge, priorities, and solutions in relation to sustainable development.
- **Stereotyping women:** Indigenous cultures, religion, race, class, ethnicity, and sexuality on a woman's social position.
- **Lack of education:** lack of education and awareness leads to ignorance. Educating and empowering women and girls can go a long way in ensuring that our response to climate



- change is inclusive, resilient, and more sustainable.
- **Harassment** is one of many gender-related challenges that frequently confront women conservation leaders.
- **Workplace barriers:** They include challenges to their competence, salary and promotion disparities, and sexual harassment.

### Conclusion

The role of women asserts a divergent view regarding participation in existing social structures. As opposed to radical and liberation-based feminist movements, mainstream feminism is tightly bound with hegemonic social status strives to promote equality within the existing social and political structure, such as making it possible for women to occupy positions of power in business, industry, and politics, using direct involvement as the main tactic for achieving pay equity and influence

14. **What is the significance of the Kigali Amendment to the Montreal Protocol for the global climate action plan? Also, elaborate on the need for India to develop a national strategy for achieving its target under the Montreal protocol in the coming year.**

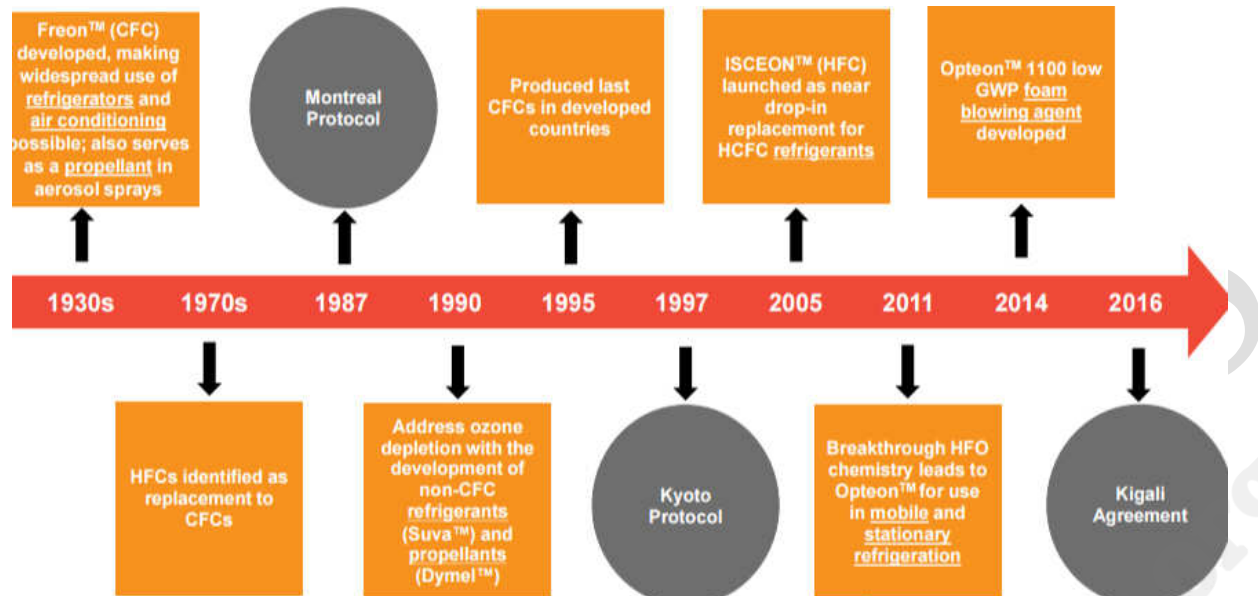
### Introduction:

**Montreal Protocol** on Substance that depletes the Ozone layer was adopted in **1987** and calls for **specific actions** to protect the ozone layer by phasing out the production of most chemicals that deplete ozone. In 2016, it was amended to include **Hydro-Fluoro-Carbons** (HFCs), this was called **Kigali Agreement**.

**India** became Party to the **Vienna Convention** and the **Montreal Protocol** in 1991 and 1992 respectively. India has recently ratified the Kigali Amendment.

### Body:

#### Evolution of Kigali Agreement:



#### Significance of Kigali Amendment to the Montreal Protocol:

- **For reduction in Ozone depletion:** Although HFCs are regarded as **weak ozone-depleting substances**; as per **NASA**, reducing HFC emissions by **50 percent** would decrease the ozone change by a comparable amount.
- **For reduction of Green House Gases:** HFCs are potent greenhouse gases that can be **hundreds to thousands of times more potent than carbon dioxide (CO<sub>2</sub>)** in contributing to climate change per unit of mass.
  - HFC phasedown is expected to prevent greenhouse gas emissions, helping reduce the increase in temperature by **0.1 degrees Celsius by 2050**.
- **To supplement success in reduction of the Ozone hole to reduce GHGs:** Montreal Protocol has been a far **more effective and successful agreement** than the climate change instruments. It has already resulted in the phase-out of **98.6% of ozone-depleting substances**. So, the Kigali amendment aims to reduce highly potent GHGs HFCs.
- **For gains in energy efficiency and transfer of cleaner technologies:** Developed countries have pledged to help developing and least developed countries in their transition to non-ozone-depleting and non-GHG coolant material through the transfer of technologies and funding.
  - These **energy-efficient technologies** will achieve energy efficiency gains and carbon dioxide emissions reduction - a "**climate co-benefit**,"
- **For India's influence and goodwill:** Ratifying the Kigali Amendment further strengthens India's effort to establish its leadership and goodwill for Climate change efforts.
- **For Atmanirbhar Bharat:** There would be scope for **domestic manufacturing** of equipment as well as alternative non-HFC and low-global warming potential chemicals to enable the industry to transition as per the agreed HFC phase-down schedule.

- In addition, there would be opportunities to promote **domestic innovation** for new generation **alternative refrigerants** and related technologies.

**Need for India to develop a national strategy:**

- **To fulfill the mandate of the Kigali Amendment:** Kigali Agreement is a legally binding agreement designed to create rights and obligations in international law.
  - India being in **Group 2** will develop its **national strategy** for phasing down of **HFCs by 2023**
- **To synergize the effort of all the stakeholders:** A national strategy for HFC reduction in consultation with Industry stakeholders- researchers, manufacturers, recyclers, etc. will help achieve the targets set up in Kigali Agreement.
  - It will help bring all stakeholders to the **same understanding** through a clear message of **public support**.
- **To exemplify India's climate leadership:** India has been at the forefront of the climate summit in preserving the rights of developing and least developing countries as well as ensuring differential responsibility based on Equity.
  - **2019:** India was 1<sup>st</sup> country to release the **India Cooling Action plan**
  - A national strategy will **help India lead the effort in HFCs reduction** as well as help other countries esp. **South Asian neighbors** and **African countries** in their transition.
- **To encourage innovations:** A national strategy will support public and private research into the alternative for HFCs
  - It will provide a stable framework for promoting **long-term research** and innovations
- **To provide incremental funding** and assist in capacity building performance
- **To follow the 'Precautionary Principle':** A national strategy will give clear guidelines for taking action even if science is still in doubt about the impact of any alternative material, thus preventing more damaging consequences if actions are postponed.
- **To enable updating of legal framework:** A national strategy will help India update its Ozone Depleting Substances Rules by mid-2024 to

**Conclusion:**

Thus, India's commitment to phasing down HFCs and bringing a national implementation strategy for it will usher in global and domestic environmental and economic benefits. It will give a boost to India's manufacturing and employment generation goals as well as help meet its INDC targets.

**15. How does climate change worsen the existing inequality and poverty for the countries around the world? Discuss**

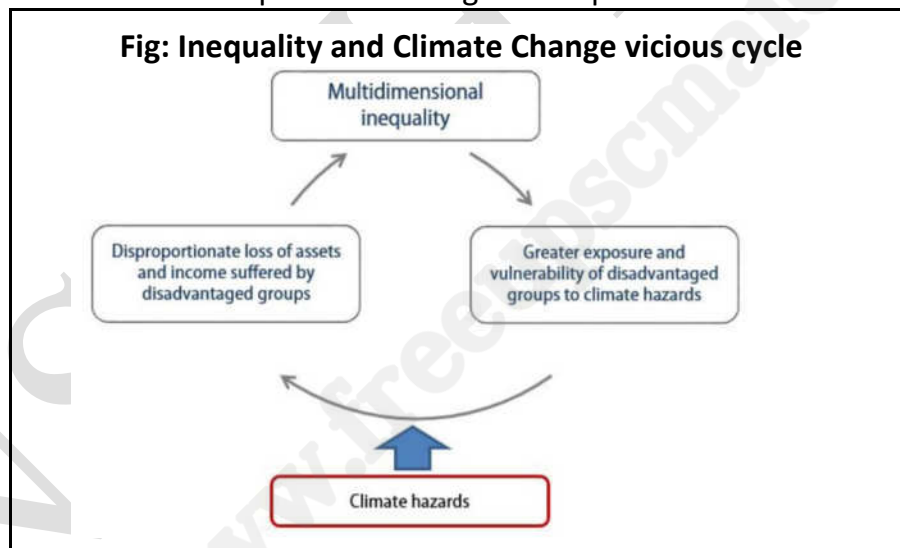
## Introduction

Over the coming decades, **Climate change** has the potential to undo much of the progress made in lifting households out of poverty over prior decades and **exacerbates Inequality** present across societies. **World Bank report (2020)** estimated that an additional **68 to 135 million people** could be pushed into poverty by 2030 because of climate change.

## Body:

### Climate change exacerbates inequity already present:

- **Vicious cycle:** Relationship is characterized by a **vicious cycle**, whereby initial inequality causes the **disadvantaged groups** to suffer **disproportionately** from the adverse effects of climate change, resulting in **greater subsequent inequality**.
  - There are 3 main ways this can occur
    - **Higher exposure:** Poorer countries, regions, and people tend to be more exposed to climate change impacts and natural disasters than their wealthier counterparts.
    - **Higher susceptibility to damage caused by climate change:** They lose a greater share of their wealth when climate shocks hit.
    - **Lower ability to cope and recover** from the damage suffered: They have fewer resources to cope with the negative impacts of climate shocks.



- **Developing countries face higher impact:** UNDP Human Development report mentions climate change will fuel inequality as it hits **developing countries**, many with limited capacity to resist threats from **malnutrition, disease, and heat stress**.
  - It mentions that the effects of climate change **deepen existing social and economic fault lines resulting in widening inequalities**.



- **Socially and geographically disadvantaged people** – including people facing **discrimination** based on gender, age, race, class, caste, indigeneity, and disability – are particularly affected negatively by climate hazards.
- Thus **Exacerbation of inequality** can happen through disproportionate erosion of physical, human, and social assets.

### Climate change impact on Poverty

- The poor are **least able to cope** with and recover from the **negative impacts of climate shocks**.
  - **Poor resources:** As they have **fewer financial resources**, both because their social networks or support systems tend to also be poor and because they have **less access to formal savings, credit, and insurance**.
  - **Problem to meet essential needs:** Wealthier households can adjust their budget, (by delaying discretionary spending), poor households already dedicate a significant share of their budget to meeting their basic needs.
  - Poor are hardest hit: When climate shocks occur, the poor typically **lose a greater share** of their wealth.
    - For example, **Hurricane Mitch** wiped out 18% of the assets of the poorest quintile in **Honduras** compared to only 3% for the richest quintile.
- **Multidimensional nature of Poverty:** Climate change was expected to increase poverty owing to its effects on agriculture, flooding, malnutrition, water resources, and health.
  - Studies identify four channels through which households may move in and out of poverty – **prices, assets, productivity, and opportunities**.
- **Impact of Disasters:** Without quick assistance in the aftermath of a disaster, **poor households** may sell productive assets, withdraw their children from school, or delay seeking medical care to meet their immediate needs, which **negatively affects their long-term prospects**.

Thus Climate change impacts tend to be **regressive**, falling more heavily on the poor than the rich.

### Suggestions and Way forward

- **Evolve a comprehensive plan:** A **development-centric approach** that aligns climate change, food security, and livelihood perspectives and takes into consideration **regional specificities** is crucial for reducing poverty and distress migrations.
- **Social protection schemes must be climate-proofed.** Create resilient infrastructural assets, diversify the economy and enhance the adaptive capacity of rural households.
  - E.g. providing **better insurance** and **formal financial products**, access to health care, and improved infrastructure services.



- **Ensure climate justice:** Climate justice requires that the advanced countries get there (net-zero) before 2050, allowing the developing countries to get there later (than 2050). Approaches should include -
  - The process to determine the **global carbon budget** in terms of the additional carbon that can be added to the atmosphere given the global warming target.
  - Agree upon a **fair way** of allocating the global budget across countries.
  - Define an **emissions trajectory** for each country that is consistent with its share of the budget.
- **Find innovative ways to low carbon economy:** More innovative ways towards a low-carbon economy comprises carbon farming mandates, legal personhood, and human rights status to nature and innovating tools of climate finance.
- **Inequality should also be considered in the design of climate change adaption and mitigation policies.**
  - By explicitly considering inequality and **involving the poor in decision-making**, can those discrepancies be resolved in a fair manner.
  - **Climate change mitigation policies**, such as the removal of subsidies for fossil fuel, can also be done **equitably**.
    - For example, the Dominican Republic, and Mexico **compensate poor households** for energy price increases through **cash transfers**.
- **Governments also need to provide assistance to the neediest when natural disasters hit.** Using funds pre-authorized for this purpose, governments can quickly target resources to the most vulnerable by utilizing existing cash transfer mechanisms.

### Conclusion

There is an urgent **moral imperative** to tackle climate change and reduce its worst impacts. The **Global reset** caused by the pandemic provides an opportunity to change climate action strategy from the unipolar focus on technologies to the focus on inequality of consumption.

There is a need for implementing **inclusive development policies** that are consistent with **climate stabilization** and **disaster risk management** goals and, at the same time, reduce **Inequality** and **Poverty**.

16. **What are the provisions related to protection of Wetlands in India. Discuss the need to highlight the importance of Ecosystem services provided by Wetlands in our development policies, urban planning, and climate change mitigation efforts.**

### Introduction

**Wetlands** are areas of marsh, fen, peatland, or water, with water that is static or flowing, including areas of marine water the depth of which at low tide **does not exceed six meters (as per Ramsar Convention)**. **Wetlands** are unique, productive ecosystems where terrestrial and aquatic habitats

meet. Wetlands play a critical role in maintaining many natural cycles and supporting a wide range of biodiversity.

### Provisions related to the protection of Wetlands in India

- **Constitutional provisions for the wetland protection**
  - **Article 21:** Every citizen is entitled to the **right to a clean environment**. The **wetlands** are considered **natural purifiers** for the environment.
  - **Article 48-A:** DPSP that deals with the protection and improvement of the
  - **Article 51(A)(g):** It imposes the **duty** over citizens to conserve and improve the environment
- **Policies and Laws for conservation of wetlands in India**
  - **Ramsar Convention on Wetlands** - The Convention acts as the foundation for the **national policies and laws** regarding the protection of wetlands.
  - **Wetlands (Conservation & Management) Rules, 2017:** To promote '**wise use**' of Wetlands so as to ensure sustainable development of the wetland ecosystem.
  - **National Plan for Conservation of Aquatic Eco-systems (NPCA)** - The scheme aims at **holistic conservation** and **restoration** of wetlands including lakes.
  - **ISRO** has prepared the **National Wetland Atlas**

### Ecosystem Services provided by Wetlands

<b>Habitat and Biodiversity</b> <ul style="list-style-type: none"> <li>● Nature Tourism</li> <li>● Commercial and Recreational Fisheries</li> </ul>	<b>Recreation</b> <ul style="list-style-type: none"> <li>● Hunting and Fishing Revenues</li> <li>● Cultural Values and Aesthetics</li> </ul>	<b>Disturbance &amp; Natural Hazard Regulation</b> <ul style="list-style-type: none"> <li>● Storm Surge Mitigation</li> <li>● Runoff and High Water Event Mitigation</li> </ul>
<b>Soil and Sediment Regulation</b> <ul style="list-style-type: none"> <li>● Reduced Water Purification Costs</li> <li>● Reduced Soil Erosion</li> </ul>	<b>Nutrient Regulation</b> <ul style="list-style-type: none"> <li>● Reduced Water Purification Costs</li> </ul>	<b>Food and Water Supply</b> <ul style="list-style-type: none"> <li>● Increased Water Quantity</li> <li>● Increased Downstream Productivity (fisheries, etc.)</li> <li>● Food (both plant and animal) and fiber harvest</li> </ul>



### Need to highlight ecosystem services - development policies, urban planning, and climate change mitigation efforts

- **Drivers of wetland loss:** Often viewed as wastelands to be drained, filled, and converted to other purposes, the main causes of wetlands loss and degradation include -
  - **Developmental policies** such as major changes in **land use**, especially an increase in agriculture, grazing, and **urban infrastructure development**.
  - **Urbanization:**
    - **Nearly 30 percent** of the natural wetlands in India have been lost in the last three decades mainly to **illegal construction, unsustainable urbanization, agricultural expansion, and pollution**, according to estimates by **Wetlands International South Asia**.
    - **Example: Chennai** lost **90%** of its wetlands to unplanned urbanization, leaving the city to grapple with issues of water security and degraded environment.
  - **Climate Change:**
    - The **IPBES** global assessment identified wetlands as the **most threatened ecosystem due to climate change**.
    - This **impacts 40%** of the world's plant and animal species that live or breed in wetlands, according to UNESCO.
    - **Wetlands ensure fresh water for us all**. Only some **3%** of the world's water is fresh, with most of that frozen. Wetlands provide water and help replenish groundwater aquifers.
    - **Wetlands feed humanity**. Rice, grown in wetland paddies, is the staple diet of nearly three billion people. Most commercial fish breed and raise their young in coastal marshes and estuaries.
    - **Wetlands help fight climate change :**
  - **Peatlands** alone store more than twice as much carbon as all the world's forests.
  - They serve as a **natural sponge** against flooding and drought, protect our coastlines and help fight climate change.
  - Faced with **rising sea levels**, coastal wetlands reduce the impact of cyclones and tsunamis. They also bind the shoreline and resist erosion.
  - **Lack of awareness:** In addition to urbanization needs, a lack of awareness and knowledge on wetlands and their ecosystem services can be blamed for this widespread loss.

#### Case studies for Wetland conservation

- In the **Mithilanchal region (north Bihar)**, Narayan Choudhary's **Talab Bachao Abhiyan** has mobilized communities over the years. The campaign



created awareness on encroachment and pollution of local ponds and pushed the government to take action.

- **Shweta Hule's 'Swamini' self-help group** of ten women have been organizing a '**mangrove safari**' for tourists in the Mandavi creek in Sindhudurg since 2017. This has been recognized as a model for **community-led conservation** through ecotourism.

### Way forward

- **Mega urban schemes** like **Smart Cities Mission** and **Atal Mission for Rejuvenation and Urban Transformation** need to add the aspects of sustainable management of wetlands.
  - **Building resilient cities:** The multiple benefits and services provided by wetlands are essential to achieve the ambitious agenda for **building resilient cities** to achieve our **sustainable development goals** and **eradicate poverty**.
- There is also a need for **stronger enforcement of rules**.
  - For example, the **National Plan for Conservation of Aquatic Ecosystems** and the **Wetlands Conservation and Management Rules, 2017** (updated in 2020), have had limited impact as regulatory bodies like the Central Wetland Regulatory Authority only have advisory powers.
- There is also a need for more **scientific data, imagery, maps**, and other relevant tools to provide knowledge on the status of wetlands.
- **Participation of Local communities** - Existing laws completely ignore the participation of local communities in governing and monitoring wetlands.
  - **Awareness** is the first step towards protection, according to the experience of **Ramveer Tanwar**, who resurrected around **20 ponds** and lakes in and around Noida.
- Plans like **Master Plan for Delhi 2041** with a focus on water bodies and the land around it are the **future of urban planning**.
  - These are referred to as the '**green-blue policy**', where **water bodies and land are interdependent**, growing with the help of each other while offering environmental and social benefits.
- **Target-oriented action program** for the **rejuvenation** and **restoration** of wetlands across the country.
  - **National Mission for Clean Ganga** in January 2021 formulated a **toolkit** for the management of wetlands and water bodies in urban areas as well as studying the concerns of rapid urbanization.

### Conclusion

**Thus, Mainstreaming wetlands ecosystem services and biodiversity** into our developmental policies and urban planning processes, including climate change mitigation, is the pressing need



of the hour. **Smart and innovative ideas** along with increasing space for people's participation in management and decision-making for their wetlands are a desperate requirement for building a **climate-resilient** future for India.

**17. Climate change is a threat – and an opportunity. In this context discuss the role of the private sector in the struggle for a greener future.**

**Introduction**

While climate change is indeed an **environmental threat**, the need for **low-carbon transition creates opportunities** for businesses. The **private sector** has the financial potential and the scope for offering **innovative solutions** that are much needed in the struggle for a greener future.

**Body**

**Need for and potential of private sector's role:**

- **To share the financial burden:**
  - During the 2015 Paris conference, it was estimated that the **developing countries** would need about **\$100 billion of new investments per year** over the next 40 years to build climate change resilience.
  - This **cannot be met out entirely by the national governments** which especially face **increased indebtedness** after the pandemic.
- **To facilitate balanced growth:**
  - There is an obvious **interdependency** between working on **climate resilience** and achieving **economic and social resilience**.
- **To build a cooperative mechanism:**
  - Governments and other players engaging with the private sector will help **mobilize resources, knowledge, and innovation** for addressing climate change and promoting green growth.
- **To avert the impending threat of temperature rise to businesses:**
  - For businesses to stay for the long term and **avoid disruptions to the supply chain**, it is crucial that they become part of the fight against climate change.
- **To cater to the emerging demand:**
  - As far as **emerging green products** are concerned, the push of the government is sometimes being overtaken by the **pull of the market**, as **more and more consumers** seek to purchase green products.
    - However, companies are still reluctant to change production methods or marketing strategies. **Government incentives** in this regard could help **bring in the true potential of the private sector**.

### Scope for private sector's contribution:

- **Offering low-carbon solutions:**
  - The need for **innovative solutions** towards climate change mitigation and adaptation opens avenues for companies to develop **new products and services that are less carbon-intensive** and serve new markets.
    - **E.g., Carbon Engineering** is a Canadian start-up that is working on taking carbon dioxide directly from the atmosphere and then using it to produce fuel.
- **Assisting in urban infrastructure:**
  - **By 2050, more than 6 billion people will live in urban areas**, creating a pressing need for a host of infrastructure services, like water and sanitation.
  - In this context, private firms can find opportunities in **eco-friendly construction** and in ensuring the **climate resilience of cities and communities**.
    - **E.g., Green buildings, AI-based emission monitoring in cities**, etc.
- **Employing healthy environmental practices:**
  - Efforts might include developing **clean infrastructure**, promoting **greener behavior across the supply chains**, and environmental consciousness in overall functioning.
    - On average, the money business firms put into **reducing GHG emissions saw an internal rate of return of 27%**, indicating that the investments were paying off.
- **Streamlining Corporate Social Responsibility:**
  - The increasing emphasis on corporate social responsibility and responsible business conduct must **accommodate the environmental efforts** as a key part within it.
- **Changing work environments post-covid:**
  - The COVID-19 **pandemic** and the lockdown have imposed **changes in working arrangements and lifestyles** that may create opportunities to increase **green efficiency savings**.
    - A flexible work option and a shift to remote working in the future may provide opportunities to **reduce travel and cut office use and energy costs**.
- **Other measures:**
  - Increasing **renewable energy**. E.g., Installing solar power panels, using e-vehicles, etc
  - Making products out of **recycled materials**
  - Employing **eco-friendly technologies** and **climate-smart financial solutions** like Green Bonds.

### Mechanisms available:

- The **UNFCCC negotiations** have focussed on **mobilizing private climate finance** resulting in high visibility for tracking the amounts of private capital mobilized.
  - However, less attention has been given to the effectiveness and impacts of these efforts.



- In India, the official recognition of the **“polluter pays principle”** is a good sign to make firms environmentally accountable. E.g., the **E-Waste management rules**.
- The multi-donor **Green for Growth Fund** provides concessional finance to public and private financial intermediaries in order to set up and demonstrate the viability of financing for low carbon technologies in the Middle East and North Africa.

#### Government measures needed in India:

- **Policy support:**
  - Governments must remove the barriers and create an **enabling policy environment** that is essential to leverage **green private investment**.
  - There must be **stable, long-term regulatory regimes**, including a **price on carbon**, for the private firms to shift to a low-carbon economy.
  - Apart from developing “green” products, a **“green” audit** should become a regular and indispensable part of corporate life.
- **Financial support:**
  - Government programs must target **improved access to finance** so that companies adopt **low-carbon technologies**.
  - Government should also provide for **balancing the profit motive of businesses with conservation** so that they take responsibility for environmental costs.
  - State subsidies for fossil fuels are keeping prices artificially low, making it hard for renewables to compete. **Investments in renewables** should be **made profitable**.

#### Conclusion

**The private sector's role towards a greener future** should revolve around a corporate philosophy that explicitly incorporates **environmental criteria in management decision-making**. Going forward, harnessing the synergies between **carbon-reduction goals, resilience-building, and COVID-19 recovery efforts** will be most appropriate for a greener future.

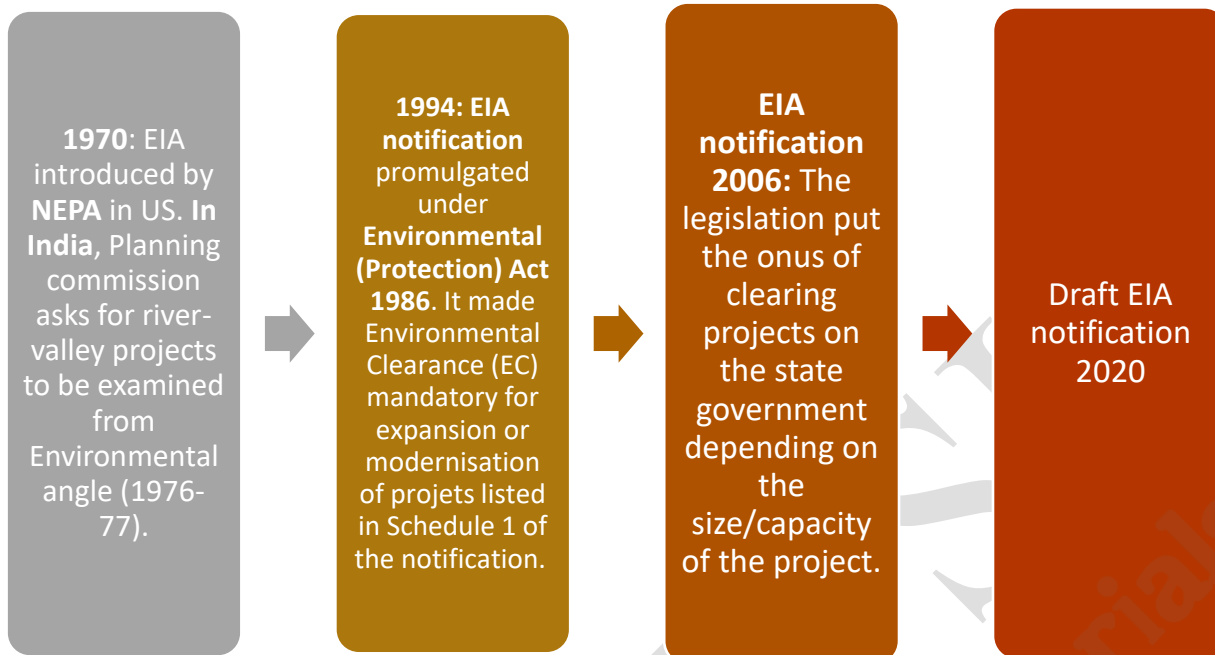
18. **Tracing the evolution of Environmental Impact Assessment, discuss its significance for developmental projects in India. Also, in brief, critically analyze the impact of draft EIA 2020 notification on the Environmental Protection measures in India.**

#### Introduction:

**Environmental Impact Assessment (EIA)** is a tool used to identify the environmental, social, and economic impacts of a project prior to decision-making (**UNEP Definition**). EIA aims to predict, at an early stage, the environmental impacts of a project and ways of mitigation of any adverse impacts for decision-makers.



**Body:**  
**Evolution of EIA:**



**Significance of EIA for Developmental Projects in India:**

- **Make all the stakeholders aware of the environmental and socio-economic impact** of the project
- **Facilitates a basis for policy decisions:** EIA provides the impact assessment well before the project is implemented.
  - EIA provides a sufficient explanation on why certain mitigation measure is important for the sustainability of the project as well as the environment.
  - EIA ensures that any impact, if any, is within the limits of the capacity of assimilation and regeneration of the ecosystem.
- **Helps to eliminate or minimize the adverse impact** of developmental projects
- **EIA encourages the adaptation of mitigation strategies** in the developmental plan
- Protects the biodiversity of the environment by suggesting **alternative safe project designs and methods.**
- **Simplifies the technical issues:** EIA produces an environmental management plan and summary for the non-tech general public.
- **To record and rate the impact levels** on the environment by proposed projects.

**Critical Analysis of Impact of Draft EIA notification 2020:**

- **Public Consultation:** Reduced to max 40 days and only 20 days (from 30days) for submitting a response



- This will help speed up the process of EIA. However, it may give very little time for Tribal and forest dwellers who are not aware of technical details or have means to access it.
- **More Discretionary power for Government:** Power to declare 'economically sensitive areas' without a public hearing as well as give any project 'strategic tag' (so no EIA obligation)
  - This is important for the clearance of strategic projects related to **defence and national security** as well as projects deemed too important for the nation.
  - However, there is fear of misuse of this clause for **political or economic reasons** to circumvent EIA
- **Post-Facto-project clearance:**
  - This will enable ease of doing business and **reduce bureaucratic delays**. But it is a **violation** of the fundamental **principles of environmental jurisprudence** and is contrary to both the **precautionary principle** as well as the need **for sustainable development**.
- **An extended period of Environmental clearance:** From 30 years to 50 years
  - However, it raises the risk of irreversible environmental, health, and social consequence.
- **Baseline data:** No need to cover all the seasons in a year.
  - This may make EIA **less reliable** and not reveal the full impact of EIA
- **Compliance Report Issues:** reduced from once every six months to once every year.
  - This will dilute the scrutiny and it may be late before any mitigation measures could be taken for highlighted project impact.

**Suggestions to modify the EIA draft:**

- **No reclassification of industries:** All industries should be strictly scrutinized for the environmental effects emerging from them in order to maintain a safe environment.
- **No dilution of public hearings:** All industries and projects should be assessed through public hearings.
- **Ecological and wildlife expert institutes, conservationists** are to be given the mandate to define 'ecological damage' along with the Central Pollution Control Board.
- **All three seasons** should be studied to prepare EIA for the establishment, expansion of industry, and any project.
- Corporates should maintain **corporate environmental responsibility**.
- The **violators of environmental** norms mentioned in the EIA should be **punished severely** and, if necessary, licenses should be canceled.
- **It should be re-prepared without giving post facto clearances** to establish industries, their development, and infrastructural expansions.

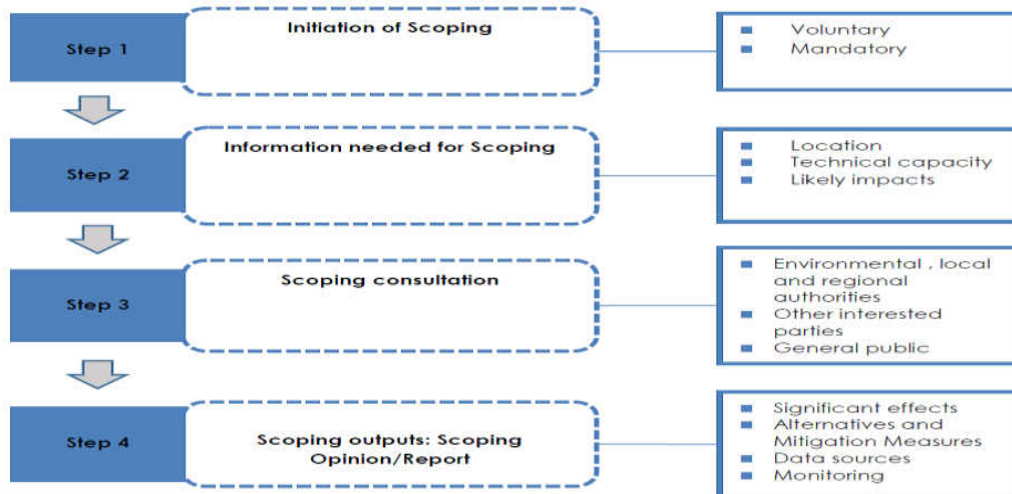
**Conclusion:**





Thus, EIA needs to provide the **balance between 'ease of doing businesses and maintaining environmental sustainability**. In this context, an **Independent EIA Authority** can be set up for fair and objective decisions. Also, a **centralized data bank** for storing information and providing access to local communities and the general public to all the aspects of projects.

#### Additional Information:



#### 19. Highlighting some of the issues of Existing Water supply systems in Urban India, discuss how the Jal Jeevan Mission (Urban) will help overcome them.

##### Introduction:

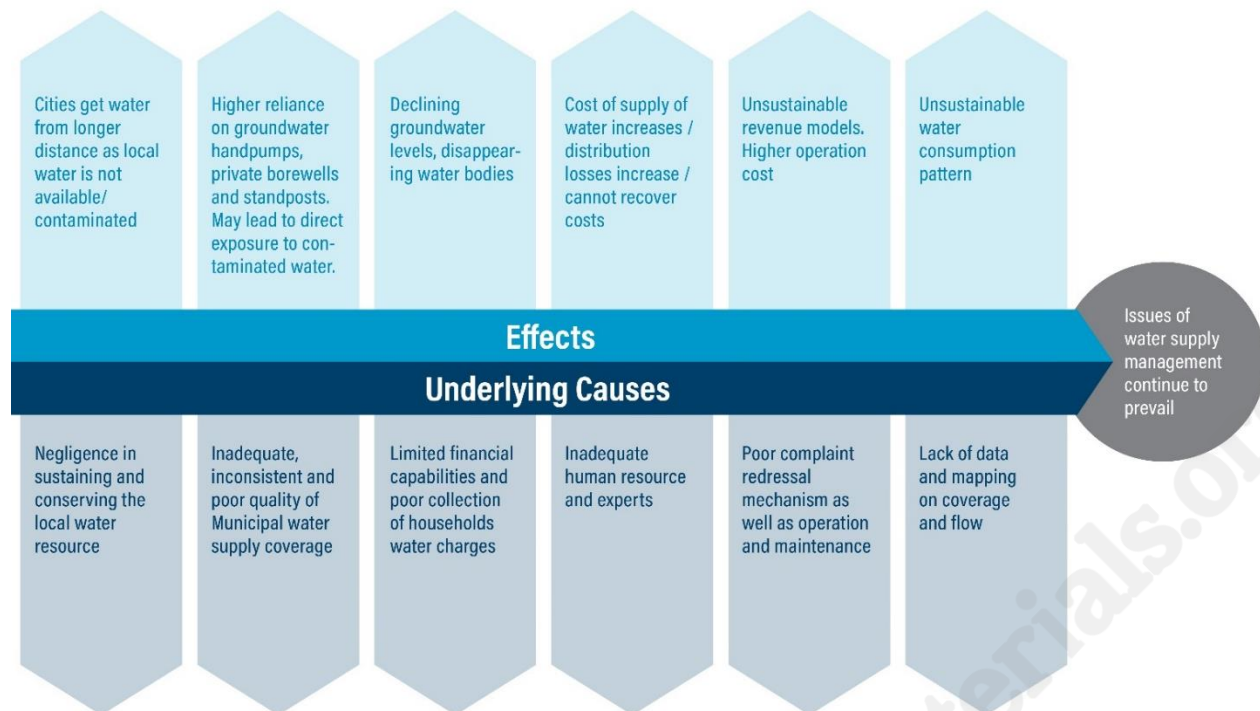
According to the **National Family Health Survey (2015-16)**, **thirty-one percent of Indian urban households** lacked access to piped or public tap water. This percentage has remained unchanged as services have not kept pace with rapid urbanization, especially hurting low-income settlements

##### Body:

##### Issues of Existing Water supply system:



## The key causes and issues in water supply sector in Indian cities



### Impact of Water Crisis in Urban areas:

- **Economic losses:** According to the Niti Aayog report by 2030, water demand will be twice the present supply which could lead to a **6% GDP loss to India**.
- **Power supply shortage:** **40% of thermal power plants** are located in areas where water scarcity is high thus impacting power generation.
- **Food Price Increase:** Indian agriculture is heavily dependent on monsoon, water scarcity heavily impacts food production because of which urban dwellers as final consumers have to pay a heavy price.
- **Drinking water scarcity:** Urban dwellers in cities and towns across India are also facing a never-seen drinking water scarcity.
  - In 2019, Chennai hit day zero of water as all its main reservoirs ran dry, forcing the government to truck in drinking water. Day zero is the day when a city's taps dry out and people have to stand in line to collect a daily quota of water
- **Conflicts over freshwater sources:** Long-drawn conflicts between Karnataka and Tamil Nadu over sharing of **Cauvery waters** between Andhra Pradesh and Telangana over sharing of **Krishna waters**, etc.

### How Jal Jeevan Mission will help overcome them:

- **Universal coverage:** It will provide 100% coverage of water supply to all households in **all 4378 statutory towns** in accordance with **SDG 6 by 2024**.



- **Rejuvenation of water bodies:** Create green space and sponge cities and enhance amenity value through an Urban Aquifer Management plan.
- **Securing tap and sewer connections:** To bridge the gap of 2.68 crore urban household functional water tap connections and provide 2.64 crore sewer connections in 500 AMRUT cities.
- **Outcome-based Funding:** Funding will be in three tranches of 20:40:40. The third installment onwards will be released based on outcomes achieved and credible exclusion.
- **Promoting PPP Model:** Mandatory for cities having the millions plus population to take up PPP projects worth a minimum of 10% of their total project fund allocation.
- To leverage the latest global technologies a Technology Sub-Mission for water.
- To spread Mass Awareness, Information, Education and Communication (IEC) campaign.
- **Pey Jal Survekshan survey** will be conducted in 10 cities to ascertain the equitable distribution of water, reuse of wastewater, and mapping of water bodies with respect to quantity and quality of water through a challenging process

**Other steps are taken for water management in Urban Areas:**

- **Atal Bhujal Yojana:** For sustainable management of groundwater resources with community participation in selected water-stressed areas.
- **National Aquifer Management Program:** For mapping of aquifers, characterization, and development of aquifer management plans.
- **National Water Policy (2012):** Include provisions like Rain Water harvesting, augmenting the availability of water through direct use of rainfall, etc.
- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT):** To provide tap connections to 1.39 crore households in 500 cities.

**Conclusion:**

UN explicitly recognizes the **human right to water and sanitation** and acknowledged that **clean drinking water and sanitation are essential to the realization of all human rights**. In India, the right to water has been interpreted as part of **Article 21** of the Indian Constitution. Jal Jeevan Mission will help achieve it.

20. **Describing some of the lacunae with the existing laws, discuss the need for India to have a new single Environmental Management Law that will subsume the existing Air Act 1981, Water Act 1974, and the Environment (Protection) Act 1986 for the governance of environmental issues in India.**

**Introduction**

**Environment Ministry** recently noted that India could soon have a single law governing air, water, and environment-related activities.



**TSR Subramaniam committee** on reviewing environmental laws, in 2014, proposed a new model umbrella law - the **Environment Law (Management Act) or ELMA** - to replace the existing Air Act 1981, Water Act 1974, and the Environment (Protection) Act 1986.

## Body

### Concerns with the existing laws:

- **Faulty implementation:**
  - The Air and Water Acts are now being **used mainly to give consent to industries** to operate or establish.
  - But their purpose is to work against air and water pollution.
- **Inefficient decision-making:**
  - **The multiplicity of laws, regulations, and institutions** is leading to **poor decision-making**, instead of improving the environmental condition.
- **Outdated methodologies:**
  - The Air and Water Acts largely **rely on criminal prosecution** as the primary tool for enforcement.
    - The time-consuming litigation, the Pollution Control Board's (PCB) insufficient capacity, and low conviction rates make criminal prosecution an **inefficient enforcement tool**.
  - The current laws are also outdated as evident with the **lack of new-age environment tools and mechanisms** such as emission trading and extended producer responsibility.
- **Shortcomings in the provisions:**
  - The Water Act, Air Act, and EP Act all contain specific provisions for offenses committed by companies and all **those in charge are liable to be punished**.
  - However, a person is **not liable** if s/he proves that the offense was **committed without her/his knowledge**, or that s/he exercised all due diligence to prevent the offense.
- **Limitations to implementation:**

#### Key environmental issues in India:

##### Water pollution:

- About **80% of surface water in India is polluted** due to sewage and garbage dumping.
- Less than half of country's 1.3 billion people receives **safe drinking water**.
- India's major rivers such as **Ganga, Yamuna and Godavari** have not seen any significant improvement in water quality despite government's huge investments.

##### Air pollution:

- Lancet report - Of the 6.67 million **deaths due to air pollution** in 2019, 1.67 million were in India, the second highest after China.
- CSE report - **Deaths due to particulate matter 2.5 pollution** have increased by 2.5 times in the past decade.

##### Polluting industries:

- There is an eight-percentage point **increase in polluting brown industries** between 2019 and 2021.
- **Environmental degradation** is becoming a major **cause of concern for agriculture in India**, with rising use of insecticides and pesticides, which is contaminating soil and ground water.



- The Acts **fail to acknowledge** the fact that environment-related issues such as pollution **transcends administrative boundaries**.
  - E.g., As a result of the above, Uttar Pradesh's PCB lacks the mandate to file a case against polluters in New Delhi.

#### **Need for a new single Environmental Management Law:**

- **To have better governance:**
  - Presently, the various laws in terms of air and water management have **overlapping provisions**, leading to **ineffectiveness in their implementation**.
  - The new law will work as a **consolidated act and assist in better governance** of the varied environmental issues.
- **To have an integrated approach:**
  - The environment is an **umbrella term encompassing air, water, biodiversity**, etc.
  - Given the looming threat of **climate change** and the **multi-layered implications** of it, there is a **need for an integrated approach** to managing environmental issues.
- **To build efficient expert bodies:**
  - The TSR Subramaniam committee had proposed that the new law will have to enable the creation of the **National and State Environment Management Authorities (NEMA and SEMAs)**.
- **To facilitate smooth project clearances:**
  - The new law will **streamline the process of environment clearances** for development projects in the country.
  - The **full-time expert bodies - NEMA and SEMAs** - will evaluate project clearance (using technology and expertise), in a time-bound manner, providing for single-window clearance.
- **To bring in international best practices:**
  - The law will introduce new environmental management tools such as **emissions trading schemes** and **extended producer responsibility**.
- **To manage violations better:**
  - Currently, violators will have to close the industry or face imprisonment.
  - The new law could have provisions for **environmental compensation** that works on the **polluter pays principle**, and thus keeps the firms functional.

#### **Counter arguments:**

- **Need for specialization:**
  - Despite the need for integration, in the **age of specialization**, there is the **need for separate specialized laws** to deal with some important issues.
  - Air and Water should also be treated separately with separate legislation as the **nature of evidence and impact of these issues are very different**.
- **Normalises violations:**





- The proposed law **discards the precautionary approach** for environmental protection and normalizes the occurrence of environmental damage.
- It **reduces legal violations to a routine matter** that can be managed through monetary payments.
- **Implementation is the key:**
  - **Strengthening the existing institutions** and ensuring **strict implementation of the existing environmental laws** is more important than scrapping and consolidating the different laws.

### Conclusion

Environmental laws, new or old, should seek to **balance the health of the environment and the needs of the public with that of the interests of the business firms**. Going ahead, the government should **engage with all stakeholders** in a meaningful way. In any case, exploitation of the environment should be prevented with firm mechanisms given the ever-increasing significance of a **sustainable environmental approach**.