

ECONOMIC SURVEY OF INDIA 2021-22

KEY HIGHLIGHTS FOR UPSC CSE

PRELIMS AND MAINS 2022

PART-4

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1) INDIA'S PROGRESS ON SUSTAINABLE DEVELOPMENT GOALS

- **About Sustainable Development Goals:** In Sep 2015, 193 countries including India committed to the SDGs through a UN Resolution – “**Transforming our World: the 2030 Agenda for Sustainable Development**”. The SDGs comprehensively cover social, economic, and environmental dimensions and build on the MDGs, which covered the earlier fifteen years from 2000-2015.



A) INDIA'S PERFORMANCE ON SDGS

- India's overall score on the NITI Aayog **SDG India Index & Dashboard** improved to 66 in 2020-21 from 60 in 2019-20 and 57 in 2018-19.
- **Despite the COVID-19 pandemic** India has **performed well on eight of the 15 SDGs** measured by NITI Aayog SDG India Index.
- These include **Goal -3, 6, 7, 10, 11, 12, 15, and 16**.

B) NITI AAYOG SDG INDIA INDEX AND DASHBOARD 2020-21

- The NITI Aayog SDG India Index is the **world's first government-led sub-national measure of SDG** progress. It has been developed to capture the progress of all states and union territories (UTs) in their journey towards achieving the SDGs. This index recognizes that action is required at all levels, and it is therefore based on the approach of cooperative and competitive federalism.
- NITI Aayog has been publishing the SDG India Index annually since 2018.
- Overall score of a state or UT is calculated based on the performance of Individual goals across 16 SDGs (note: SDG India Index 2020-21, only does a qualitative assessment of Goal 17).

C) EVOLUTION OF NITI AAYOG SDG INDIA INDEX

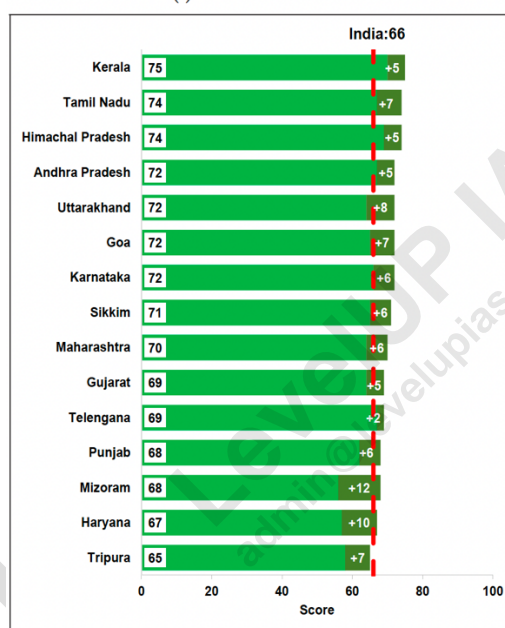
Goal-wise ranking of States/ UTs and overall ranking based on performance on all goals	Promotes competition among the States/ UTs in line with NITI Aayog's approach of competitive federalism	Enable States/ UTs to learn from peers
	Supports States/ UTs in identifying priority areas	Highlights gaps in statistical systems
Baseline report – 2018	V2.0 report – 2019-20	V3.0 report – 2020-21
13 goals	16 goals + qualitative analysis on goal 17	16 goals + qualitative analysis on Goal 17
39 targets	54 targets	70 targets
62 indicators	100 indicators	115 indicators
Goal-wise ranking on States/ UTs	Goal-wise ranking on States/ UTs + State/ UT profiles	Goal-wise ranking on States/ UTs + State/ UT profiles
Preceded National Indicator Framework (NIF)	Aligned with NIF: 68 indicators completely aligned, 20 refined, 12 new to cover goals 12, 13, and 14	Aligned with NIF: 76 indicators completely aligned, 31 refined, 8 in consultation with the line ministries

Source: NITI Aayog

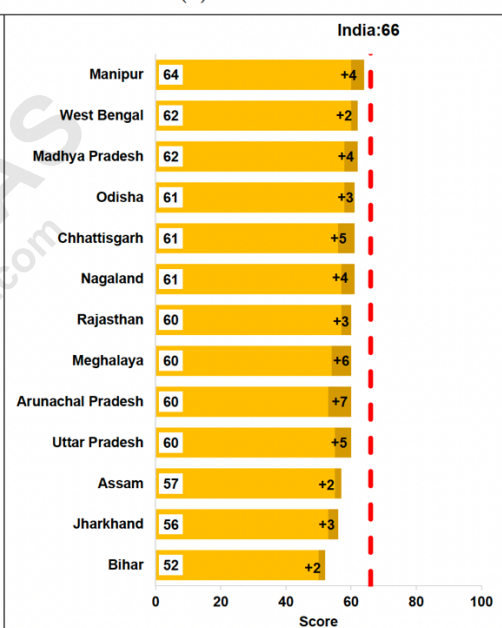
Note: Ministry of Statistics and Programme Implementation (MoSPI) has developed the National Indicator Framework (NIF) comprising 306 statistical indicators for monitoring of SDGs at the national level

D) PERFORMANCE OF STATES AND UTs ON THE NITI AAYOG SDG INDIA INDEX 2021

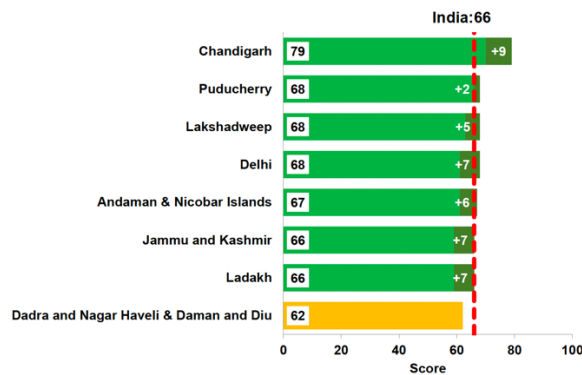
(i) Front Runners



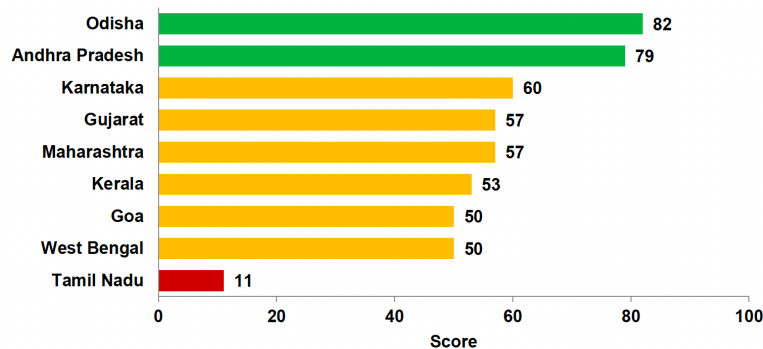
(ii) Performers



- Source: NITI Aayog
- The number of **Front runners** (scoring 65-99) increased to 22 states/UTs in 2020-21 from 10 in 2019-20. All remaining states/UTs were performers (scoring 50-64).
- **Kerala** (score of 75) retained its top rank amongst states in 2020-21. TN and Himachal ranked second while Goa, UK, Karnataka and Andhra Pradesh ranked fourth. Mizo, Haryana and Uttarakhand are the top gainers in 2020-21, in terms of improvement in score from 2019.
- **Performance of Uts**

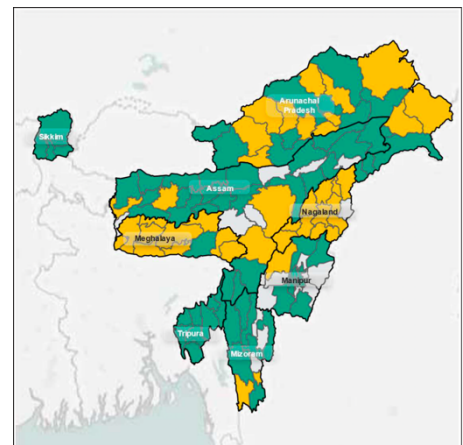


E) PERFORMANCE OF 9 COASTAL STATES ON SDG 14 (LIFE BELOW WATER)



F) NORTH EASTERN REGION (NER) DISTRICT SDG INDEX 2021-22

- Special attention is being paid to achievement of SDGs in the North-East region, with a North-Eastern Region (NER) District SDG Index 2021-22 developed by NITI Aayog.
- The index is constructed from 84 indicators and covers 15 global goals, 50 SDG targets and 103 districts in the eight states of the North Eastern Region. It facilitates in identifying crucial gaps and inform interventions to fast-track progress towards achieving the SDGs in the region.
- The scores of 103 districts range from 75.87 in East Sikkim (Sikkim) to 53.00 in Kiphire (Nagaland).
 - o There are 64 districts in the Front runner category and 39 in the Performer category.
 - o All districts of Sikkim and Tripura fall in the Front Runner Category.



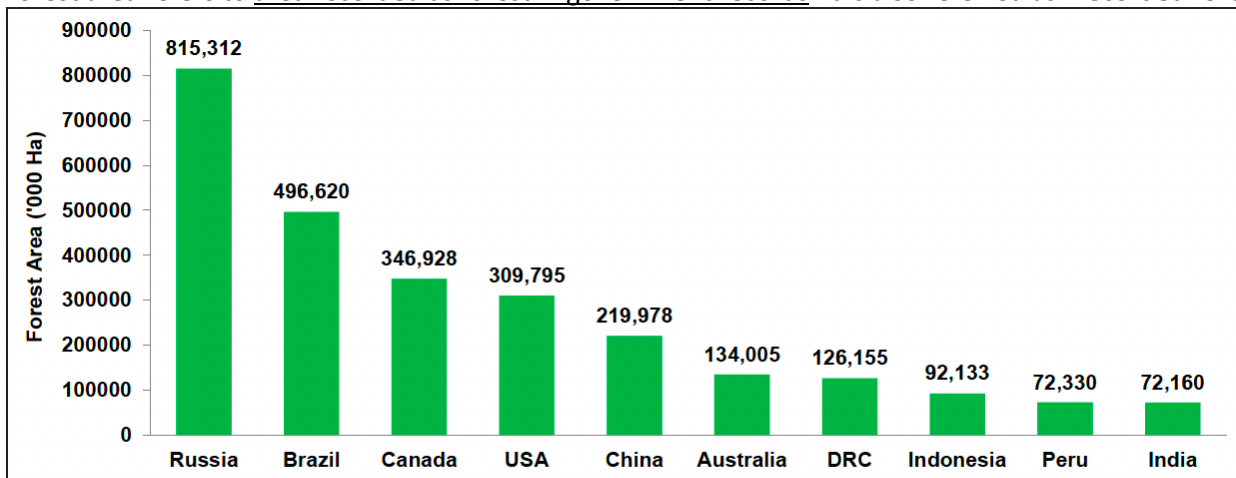
Source: NITI Aayog
Note: Yellow indicates Performer (Score 50-64), Green indicates Front Runner (Score 65-99). Uncoloured areas are districts that have not been covered.

2) STATE OF THE ENVIRONMENT – FOREST

- Sustainable development requires balancing of rapid economic growth with conservation, ecological security, and environmental sustainability.

A) LARGEST FOREST AREA COUNTRIES

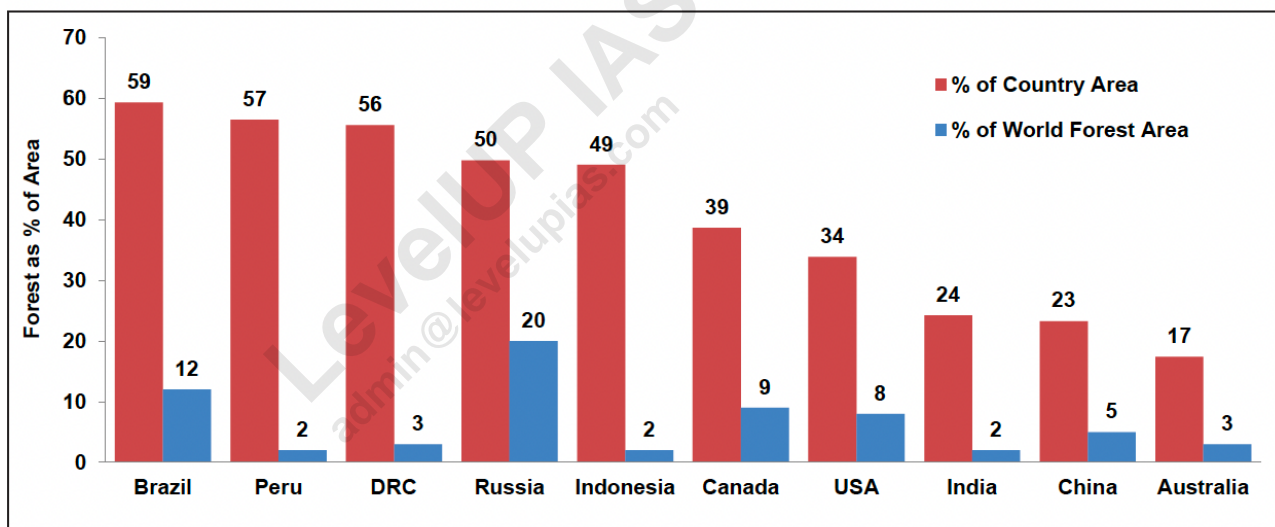
- Forest area refers to area recorded as forest in government records. It is also referred as “**recorded forest area**”.



Source: India State of Forest Report 2021

Note: DRC: Democratic Republic of the Congo

B) TOP 10 COUNTRIES BY FOREST AREA AS PERCENTAGE OF THE TOTAL GEOGRAPHICAL AREA

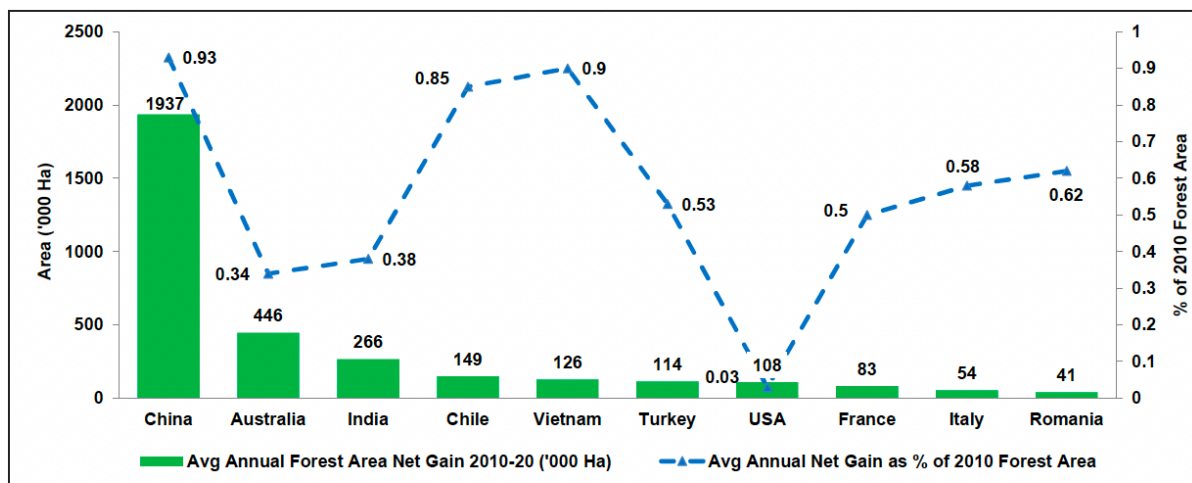


Source: India State of Forest Report 2021

Note: DRC: Democratic Republic of the Congo

C) TOP 10 COUNTRIES IN TERMS OF AVERAGE ANNUAL NET GAIN IN FOREST AREA (2010-20)

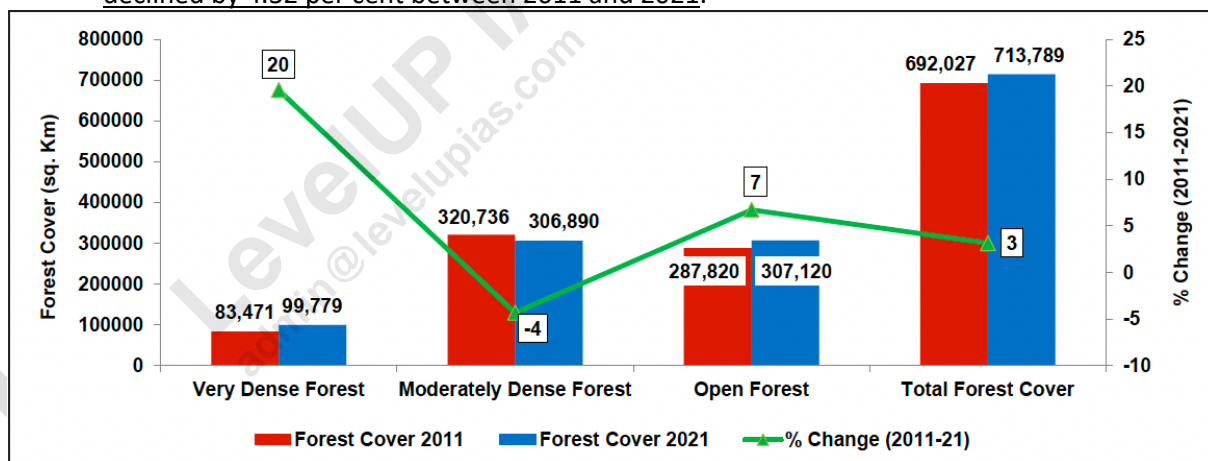
- Forest Area covered 24% of India's total geographical area accounting for 2% of the world's total forest area in 2020.



Source: India State of Forest Report 2021

D) FOREST COVER OF INDIA

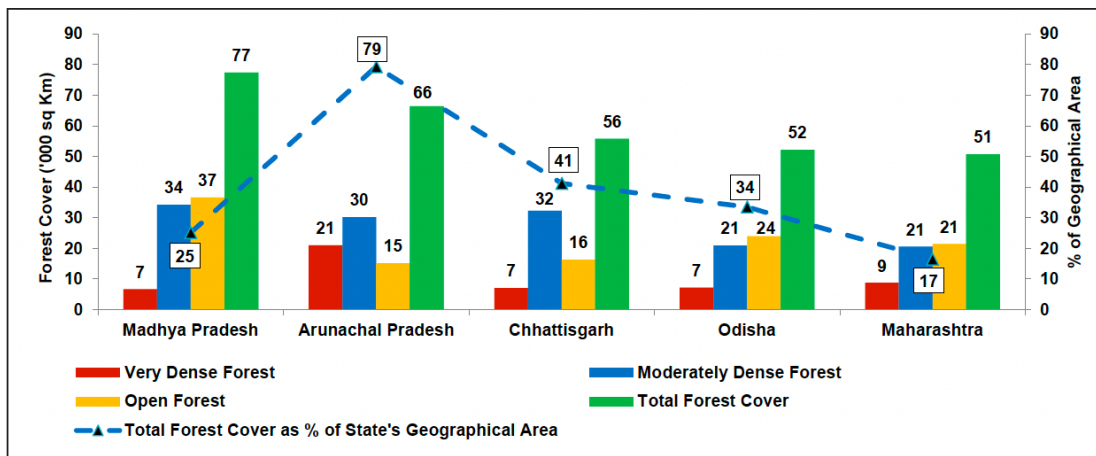
- **Forest Cover** comprises all lands, more than one hectare in area, with a tree canopy density of more than 10 per cent, irrespective of ownership and legal status.
 - o May not necessarily be a recorded forest area, and also include orchards, bamboo and palm plantations.
- India's **total forest cover** was **7,13,789 sq km** in 2021. This is equal to **21.71% of India's total Area**.
 - o In 2011, the total area under forest cover was **21.05%**. So, there has been an **increase of 3.14 percent in the forest cover over 2011**.
 - o This increase in total forest cover is **mainly attributed to increase in very dense forest** (all lands with tree canopy density of 70 per cent and above), which **rose by 19.54 per cent between 2011 and 2021**. **Open forest** (all lands with tree canopy density between 10-40 per cent) **also improved by 6.71 per cent**, while **moderately dense forest** (all lands with tree canopy density between 40-70 per cent) **declined by 4.32 per cent between 2011 and 2021**.



Source: India State of Forest Report 2021 and 2011

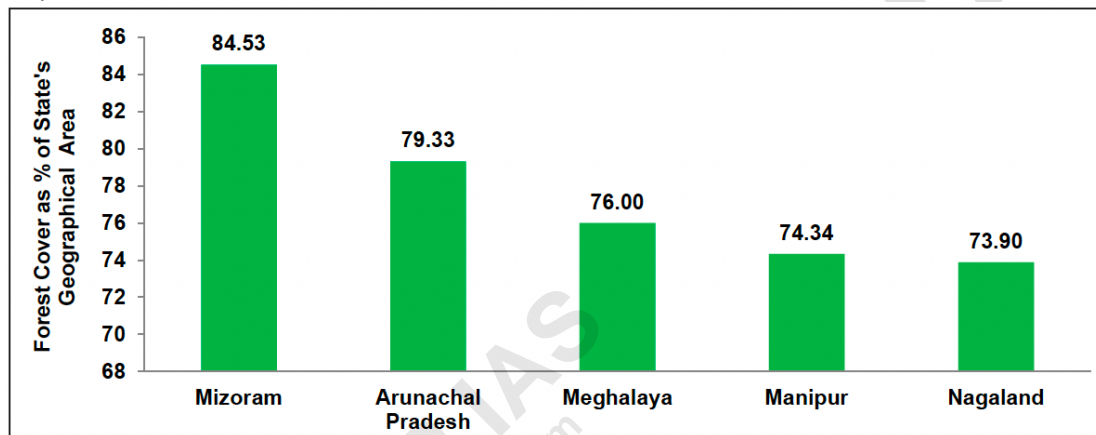
E) TOP FIVE STATES IN INDIA BY FOREST COVER

- Madhya Pradesh (11% of the total forest cover), Arunachal Pradesh (9%), Chhattisgarh (8%), Odisha (7%), and Maharashtra (7%).



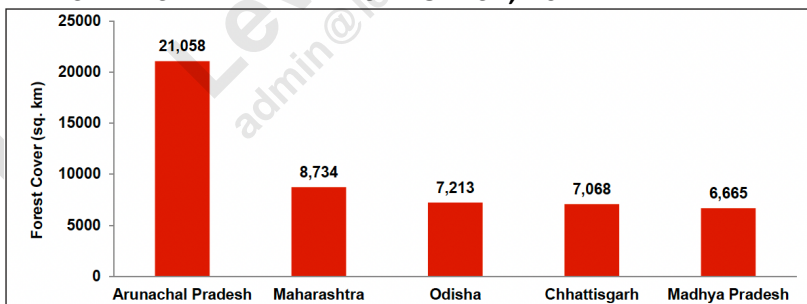
F) TOP FIVE STATES BY PER CENT OF STATE GEOGRAPHICAL AREA UNDER FOREST COVER, 2021

- As per ESI:



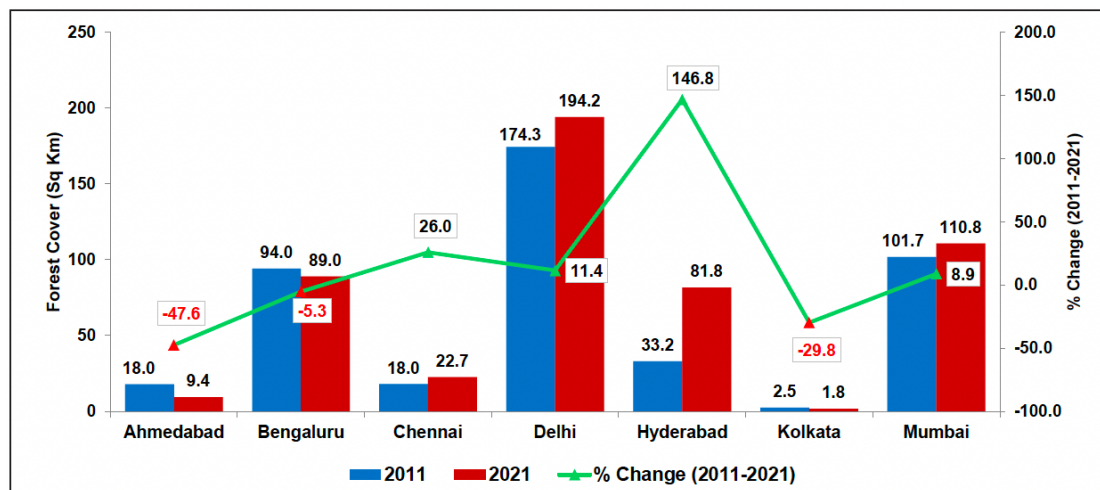
- **Note:** The above data has not included islands of A&N and Lakshadweep as they are UTs:
 - o Lakshadweep (90%) A&N Islands: 81.75%

G) TOP FIVE STATES BY VERY DENSE FOREST, 2021

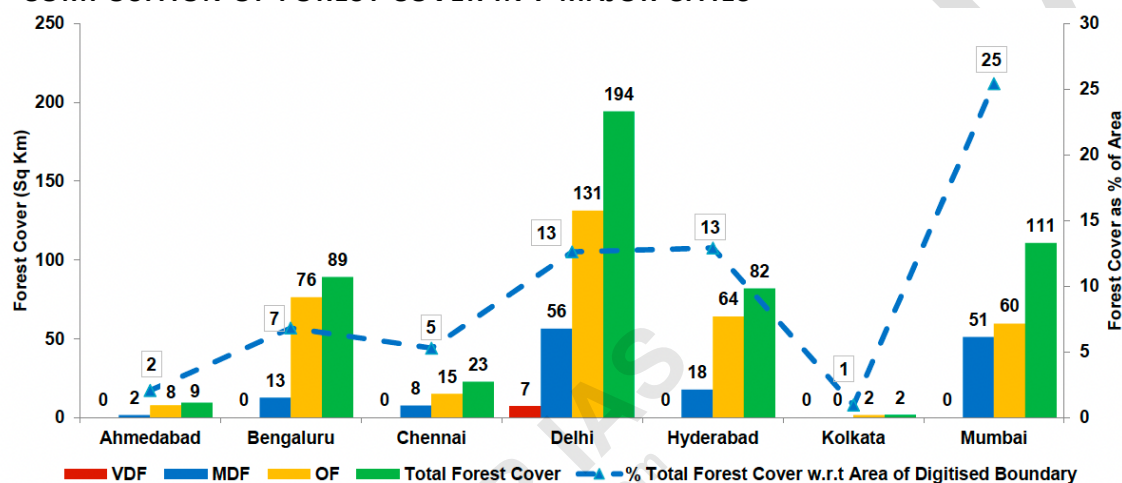


Source: India State of Forest Report 2021

H) FOREST COVER IN 7 MAJOR CITIES (2011 AND 2021)



I) COMPOSITION OF FOREST COVER IN 7 MAJOR CITIES



3) PLASTIC WASTE MANAGEMENT AND ELIMINATION OF IDENTIFIED SINGLE USE PLASTICS

- India is committed and is striving towards eliminating the identified single use plastics. In 2018, PM Modi had announced that India would phase-out single use plastic by 2022.
- The **Hazardous and other Wastes** (Management and Transboundary Movement) Rules, 2016, regulates the import of identified plastic waste into the country by SEZs and EOUs.
- The **Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016** as amended regulate the import of identified plastic waste into the country by SEZ and EOUs. This helps in preventing the dumping of plastic waste by other countries in India and also allows better recycling of the plastic waste generating in the country.
- In the **Fourth United Nations Environment Assembly** held in 2019, **India piloted** a resolution on “Addressing Single Use Plastic Product Pollution”. This was adopted and recognizes the need of global community to act together against single use plastics.

- In 2021, Following domestic regulatory measures were taken against Plastic Pollution

A) AMENDMENT OF PLASTIC WASTE MANAGEMENT (AMENDMENT) RULES, 2021

- By MoEF&CC
- **Prohibits** identified single use plastic items which have low utility and high littering potential by 2022.
- The manufacture, import, stocking, distribution, sale, and use of identified single-use plastic, including polystyrene, and expanded polystyrene, commodities shall be prohibited with effect from 1st July 2022.
- **Increase in min thickness of plastic carry bags:**
 - o 75 microns (from earlier 50 microns) wef from 30th Sep 2021
 - o 120 microns wef from 31st Dec 2022
 - o **Advantages of increasing thickness:** (increased cost, increased recyclability, reduced mobility, reduced changes of ingestion by animals)
- **Plastic waste not covered under the above phase out of identified single use plastic items** – shall be collected and managed in an environmentally sustainable way through EPR as per the 2016 rules.
- The amendment also gives legal force to the EPR Guidelines for its effective implementation.

B) DRAFT REGULATION ON THE EPR FOR PLASTIC PACKAGING UNDER PLASTIC WASTE MANAGEMENT RULES, 2016

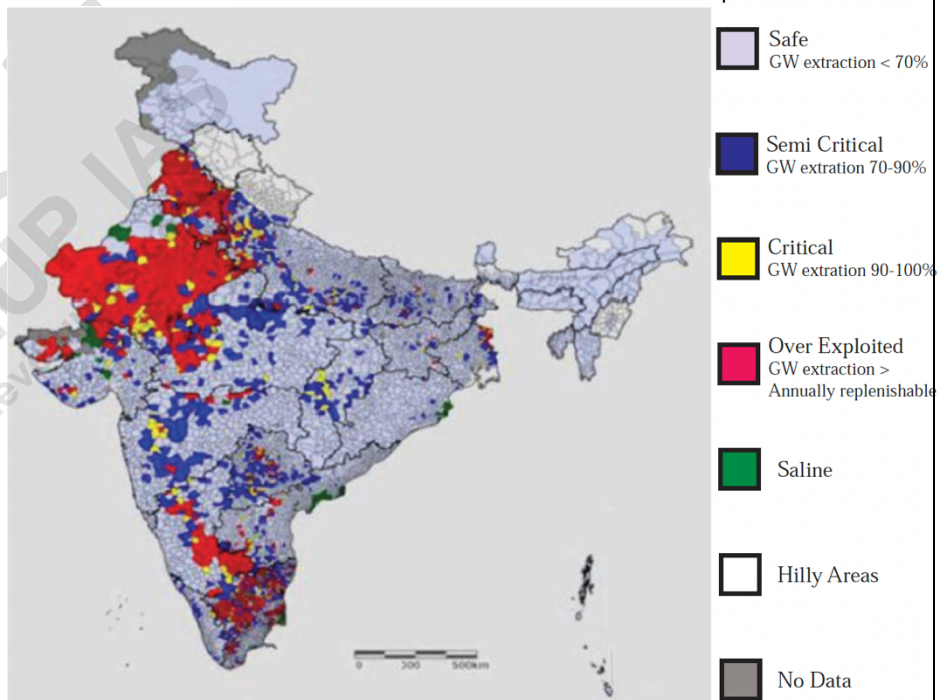
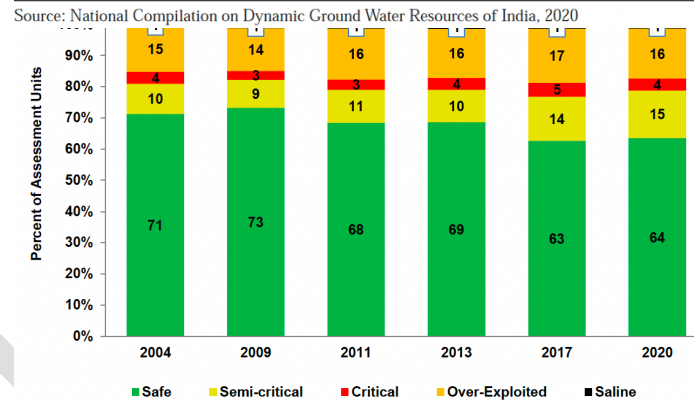
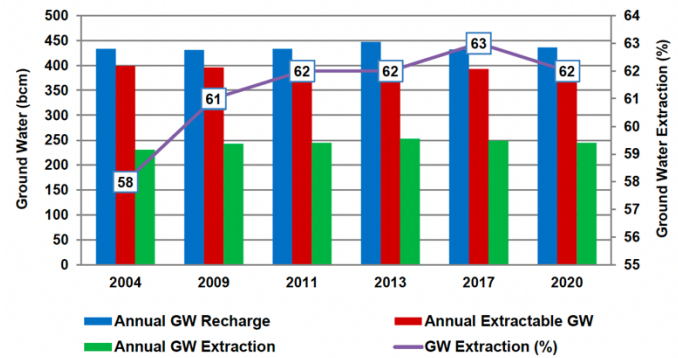
- Notified by MoEF&CC in Oct 2021 for public consultation.
- It proposes to mandate reuse, minimum level of recycling of plastic packaging waste, use of recycled plastic content, and environmentally sound management of plastic waste.
- It also seeks to strengthen the circular economy of plastic packaging waste, promote development of new alternatives to plastics and sustainable plastic packaging.

C) OTHER STEPS TO ELIMINATE SUP AND IMPLEMENTATION OF PLASTIC WASTE (MANAGEMENT) RULES, 2017

- **Improvement of waste management infrastructure** in the states/Uts under SBM
- **All states/Uts** have been requested to constitute a Special Task Force
- **All states/Uts and relevant central ministries/departments** have been requested to develop a comprehensive action plan for elimination of SUP and implementation of 2016 rules in a time bound manner.
- A **National Level Taskforce** has been constituted by MoEF&CC for coordinated efforts. All states/Uts and concerned central ministries are members of the National Task Force. The first meeting of the National Task force was held in Aug 2021.
- **Various awareness generation** initiatives.

4) WATER: GROUND WATER

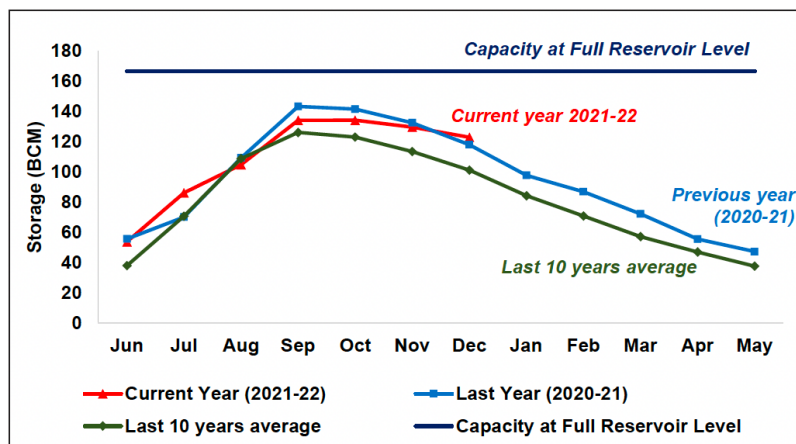
- Ground water plays a crucial role in India's agriculture sector, industrial sector and drinking water requirements. However, unsustainable extraction of ground water can severely compromise ground water resources.
- **Ground Water Resource Assessment of States/Uts** is carried out jointly by state ground water departments and Central Ground Water Board at periodic intervals, and **Dynamic Ground Water Resources of India** is published by compiling the state/UT wise ground water resources assessed.
- **Ground Water Resource Assessments (2004-2020)**
 - o Annual Ground water recharge has remained similar between 2004-2020 (except in 2013)
 - o Annual Ground water extraction has been in the range of 58-63 percent during this period.
- The extent of ground water extraction varies across the country. The Ground water assessment units (blocks, Taluks, mandals, tehsil etc.) are classified based on the stage of extraction (SOE):
 - o **Safe:** If SoE < 70%
 - o **Semi Critical:** If SOE > 70%, but <= 90%
 - o **Critical:** If SOE > 90% and <=100%
 - o **Over Exploited:** If SOE > 100%
- The number of 'safe' units have declined between 2009 to 2020. (73% in 2009 to 64% in 2020)
- **Semi-Critical units** have increased from 9% in 2009 to 15% in 2020.
- **Critical Units** has remained in the range of 3-5%.
- **Over-exploited Units** have remained in the range of 14-17%.
- **Over-Exploitation** of ground water resources is mostly concentrated in north-west India and South India.



Source: National Compilation on Dynamic Ground Water Resources of India, 2020

5) WATER RESERVOIRS

- Reservoirs are an important source of water resource for the country. However, they are particularly prone to seasonality and are greatly impacted by rainfall and temperature pattern. Live storage is at its peak during Monsoon months and lowest in summer months, requiring careful planning and coordination of storage, release, and utilization of reservoirs.



Source: India Water Resources Information System, Ministry of Jal Shakti

6) WATER: RIVER POLLUTION – NAMAMI GANGE

- **Significance of Ganga River Basin:**
 - o India has several perennial and seasonal rivers. The Ganga River Basin is the largest river basin in India, covering more than a quarter of country's land area, hosting about 43% of its population and contributing 28% of India's water resources.
 - o In recognition of River Ganga's significant economic, environmental, cultural, and religious value, the GoI declared River Ganga as the National River in 2008.
 - o Further, the Namami Gange Mission was launched in 2014 as an integrated and multi-sectoral mission for conservation of Ganga and its tributaries.

A) NAMAMI GANGE MISSION

- The Namami Gange Mission aims to protect, conserve, and rejuvenate the Ganga River Basin.
- In 2015, the Cabinet approved the Mission for a period of five years (2015-2020) with a **budget outlay of ` 20,000 crores**.
- In 2016, **National Mission for Clean Ganga** was set up under the Environment (Protection) Act, 1986. It is the nodal agency responsible for monitoring and implementing Namami Gange.
- A **Clean Ganga Fund (CGF)** was established in 2014 with the objective of contributing to the national effort of improving cleanliness of river Ganga with the contributions received from the residents of the country, NRIs/PIOs, corporates and organizations. As of Dec 2021, a total of Rs 561 crore has been received under the GCF.
- **Namami Gange has four pillars:**
 - o **Nirmal Ganga** (Clean Ganga)
 - o **Aviral Flow** (continuous flow)
 - o **Jan Ganga** (People-river connect)
 - o **Gyan Ganga** (Research and knowledge Management)
- As of **Dec 2021**, more than 350 projects worth more than Rs 30,000 crores have been **sanctioned** under the mission.

B) PILLAR 1: NIRMAL GANGA (CLEAN GANGA)

- **Sewerage Projects:** As of Dec 2021, 160 sewerage projects have been sanctioned at a cost of Rs 24,568 crores to create a cumulative treatment capacity of 5,024 MLD, reflecting a 10-fold increase from the 463 MLD through 28

projects in 2014. **Highest number of projects** have been created in Uttar Pradesh, followed by Bihar, Uttarakhand, WB, Delhi, Jharkhand, Himachal, and Rajasthan.

- **Grossly Polluting Industries (GPIs):**

- **GPIs along the river Ganga** have been inventoried.,
- **Sector specific charters** for implementation of cleaner technology, upgradation of treatment facility and adaptation of waste minimization practices have been implemented in the major industrial sectors like pulp & paper, distilleries, sugar and textile by involving different stakeholders.
- **Results:** Improvement in compliance (from 39% in 2017 to 81% in 2020) by GPIs due to regular monitoring; Significant reduction in wastewater discharge and pollution load (effluent discharge has reduced from 349.13 MLD in 2017 to 280.02 MLD in 2020).
-
- These actions have resulted in significant reduction in wastewater discharge and pollution load. Figure 24 shows the improvement in compliance status of GPIs located in the Ganga main stem and its tributaries from 39 per cent in 2017 to 81 per cent in 2020 due to regular monitoring of these industries through annual inspections by independent technical institutes. Figure 25 shows the consequent reduction in effluent discharge from 349.13 MLD in 2017 to 280.20 MLD in 2020

C) PILLAR 2: AVIRAL LOW (CONTINUOUS FLOW)

- A **historical ecological flow notification mandating the minimum flow** of river Ganga was released in 2016, recognizing the right of the river over its own water.
- **Other steps** in this direction include afforestation of 29,000 Ha; first of its kind river bio-diversity assessment for the main stem Ganga river covering over 2,200 km; identification of 279 wetlands for conservation; and preparation of integrated management plan for 118 wetlands

D) PILLAR 3: JAN GANGA (PEOPLE-RIVER CONNECT)

- This component acknowledges the critical importance of strengthening the people-river connection in achieving the mission objectives.
- **Ganga Quest 2021** got an enthusiastic response of over 1 million participants from 113 countries.
- **Ganga Utsav 2021** was celebrated for the first time as a river festival extending beyond Ganga basin cities.
- **The River City Alliance** was launched in November 2021, as a platform for river cities in India to ideate, discuss, and exchange information for the sustainable management of urban rivers.

E) PILLAR 4: GYAN GANGA (RESEARCH AND KNOWLEDGE MANAGEMENT)

- Under this the **Ganga Knowledge Centre** was set up to create a state-of-the-art center to support the NMCG and create a comprehensive knowledge base on Ganga.
- In addition, the **Centre for Ganga Management & Study was set up at IIT Kanpur** for long term basin studies and technology development.

7) AIR

- **National Clean Air Program** aims to tackle the air pollution problem in a comprehensive way. It targets to achieve 20-30% reduction in PM concentration by 2024 across the country keeping 2017 as the base year. It is being implemented in 132 cities of which 124 have been identified based on non-conformity with National Ambient Air Quality Standards for five consecutive years. It includes 34 million plus cities identified by 15th finance commission. It also includes eight others million plus cities, which fall under 15th FC grant for receiving performance-based grant for air quality improvement.
- **Several Steps** which have been taken to control air pollution include:

A) REDUCING POLLUTION FROM VEHICULAR EMISSIONS

- Moving to BS-VI norm (directly from BS-IV) for fuel and vehicles since April 2020.
- Metro rail now cover more cities
- Introduction of Cleaner fuels like CNG, LPG and ethanol blending.
- Promoting Electrical Vehicles – Government approved phase-II of FAME Scheme with an outlay of Rs 10,000 crore for a period of five years commencing from 1st April 2019.
 - o 86% funds are going for demand incentivization. This phase aims to generate demand by way of supporting 7,090 e-buses, 5 lakh e-3 wheelers, 55,000 e-4 wheelers passenger cars and 10 lakh e02 wheelers.
 - o Permit requirement for electric vehicles has been removed.

B) REDUCING POLLUTION FROM INDUSTRIAL EMISSIONS:

- Stringent emission norms for thermal power plants
- Ban on use of imported pet coke since July 2018 (with an exception for permitted processes)
- Improved **monitoring** -> Online continuous emission monitoring devices have been installed for highly polluting industries
- **Advanced Zig-zag technology** in brick kilns to reduce pollution.

C) REDUCING POLLUTION DUE TO DUST AND BURNING OF WASTE

- Various **waste management rules** covering solid waste, plastic waste, e-waste, biomedical waste, construction and demolition waste and hazardous waste have been notified.
- Waste processing plants have been set up
- Extended Producer Responsibility for plastic and e-waste management has been introduced.
- Burning of biomass/garbage has been banned.

D) MONITORING OF AMBIENT AIR QUALITY

- Air Quality monitoring network of manual as well as Continuous monitoring stations such as national Air Monitoring Program, have been expanded.
- **Pilot projects** have been initiated to assess alternate ambient monitoring tech such as low-cost sensors and satellite-based monitoring.
- **Air Quality Early Warning System**, which provides alerts for taking timely action, is being implemented in Delhi, Kanpur, and Lucknow.

Impact of Various Air pollution Related INitatives:

- **96 cities showed a decreasing trend of PM10** concentration in 2020-21 as compared to 2019-20
- The number of cities within the prescribed National Ambient Air Quality Standard (PM10 less than 60 µg/m³) also increased from 18 in 2019-20 to 27 in 2020-21
- However, air pollution **remains a major concern**, with 36 cities showing an increasing trend in PM10 concentration in 2020-2021 as compared to 2019-2020.

E) KEY MEASURES TO FIGHT AIR POLLUTION IN DELHI

- **A Commission on Air Quality Management in NCR and Adjoining Areas** was promulgated vide ordinance dated 13th July 2021 for better co-ordination, research, identification, and resolution of problems surrounding the air quality index.
- **Promotion of Agricultural Mechanization for in-situ management of Crop Residue in the States of Punjab, Haryana, Uttar Pradesh and NCT of Delhi** – 50% subsidy to individual farmers and 80% subsidy for establishment of Custom Hiring Centres.
- **Banning of old vehicles** (diesel vehicles older than 10 years and Petrol Vehicles older than 15 years) have been banned in Delhi and NCR
- **Expressways and Highways** to divert non-destined traffic away from Delhi.
- **Shifting Industries to clean fuel and installation of Online Monitoring of Industrial Emission & Effluent Systems** in red category industries in Delhi-NCR is in progress.

Impact:

- As a result of above initiative, there has been an improvement in air quality index for Delhi since 2016.
- The number of 'Good', 'Satisfactory' and 'Moderate' days increased to 197 in 2021 as against 108 in 2016, and number of 'Poor', 'Very Poor' and 'Severe' days decreased to 168 in 2021 against 246 in 2016
- **Continuous Ambient Air Quality Monitoring Stations (CAAQMS) data** for Delhi reveals that annual concentration of PM has decreased gradually since 2016. Delhi achieved approximately 22 per cent reduction in PM2.5 and 27 per cent reduction in PM10 in 2021 as compared to 2016.

8) CLIMATE CHANGE

A) NATIONAL ACTION PLAN ON CLIMATE CHANGE (NAPCC)

- India launched the National Action Plan on Climate Change (NAPCC) in 2008 and established 8 National Missions to advance actions on country's climate priorities. The major developments under the NAPCC are as below:

Missions	Major Objectives/ Target	Progress
1. National Solar Mission (NSM)	Achieve 100 GW of solar power in seven years starting from 2014-15	As of 31st December 2021, solar power capacity of 49.35 GW has been installed in the country.
2. National Mission for Enhanced Energy Efficiency (NMEEE)	<ul style="list-style-type: none">- To achieve growth with ecological sustainability- Mandating reduction in energy consumption in large energy consuming industries- Financing for PPP to reduce energy consumption through demand-side management programs in the municipal, buildings and agricultural sectors- Energy incentives, including reduced taxes on energy-efficient appliances	<p>The Perform Achieve and Trade (PAT) Scheme was initiated in March 2012</p> <ul style="list-style-type: none">- Implementation of PAT Cycle I (2012-2015) resulted in annual energy savings of 8.67 Million Tonne of Oil Equivalent (MTOE) from 8 sectors. Emission reduction of 31 million tonnes of CO₂ was achieved.- Under PAT Cycle II (2016-17 to 2018-19), annual energy savings of 14.08 MTOE was achieved from 11 sectors. Emission reduction of 66.01 million tonnes of CO₂ was achieved.- PAT Cycle III (2017-18 to 2019-20) concluded on 31st March 2020. Results of this cycle are awaited.- Currently, PAT Cycle IV is under implementation. Energy savings of approximately 26 MTOE are expected to be achieved.

3. National Mission for a Green India (GIM)	<p>Improved ecosystem services by increasing forest/tree cover by 5 m ha and improving quality of forest cover on another 5 m ha (a total of 10 m ha).</p>	<ul style="list-style-type: none"> - A sum of ₹ 455.75 crore has been released to 14 states and one UT during 2015-16 to 2020-21. - Afforestation activities were taken up over an area of 1,17,757 ha. - Alternative fuel energy devices have been distributed to 33,099 households.
4. National Mission on Sustainable Habitat (NMSH)	<ul style="list-style-type: none"> - Development of sustainable habitat standards. - Promoting energy efficiency as a core component of urban planning by extending the existing Energy Conservation Building Code - Strengthening enforcement of automotive fuel economy standards - Using pricing measures to encourage the purchase of efficient vehicles and incentives for the use of public transportation 	<ul style="list-style-type: none"> - NMSH is being implemented through three programmes: Atal Mission on Rejuvenation and Urban Transformation, Swachh Bharat Mission, and Smart Cities Mission - Energy Conservation Building Rules 2018 has been made mandatory for commercial buildings having connected load of 100 KW or above. - 702 km of conventional metro is operational in the country. Additional 1,016 km of metro and regional rapid transit system is under construction in 27 cities. - Under Smart Cities Mission, Climate Smart Cities Assessment Framework 2019 has been launched to provide clear roadmap to combat climate change through mitigation and adaptation measures. - Urban Swachh Bharat Mission 2.0 will be implemented with a total financial allocation of ₹ 1,41,678 crores over a period of 5 years from 2021-2026.

5. National Water Mission (NWM)

- Focuses on monitoring of ground water, aquifer mapping, capacity building, water quality monitoring and other baseline studies.
- Promoting citizen and state action for water conservation, augmentation, and preservation.
- Focusing attention on overexploited areas.
- Promoting basin-level integrated water resources management.
- The National Institute of Hydrology is the nodal agency to get the State Specific Action Plan (SSAP) for the water sector for 19 selected states. Five States have completed the first phase of SSAP.
- 15640 ground water observation wells are being monitored by Central Ground Water Board.

6. National Mission for Sustainable Agriculture

- Enhancing food security by making agriculture more productive, sustainable, remunerative, and climate resilient
- The mission has resulted in the formation of National Innovations on Climate Resilient Agriculture, a network project of the Indian Council of Agricultural Research.
 - Key targets for FY 2021-2025 include covering 20 lakh hectare of area under organic farming, 87 lakh hectare under precision irrigation, 2.10 lakh hectare under System for Rice Intensification, 6 lakh hectare under diversification to less water consuming crop, 1.19 lakh hectare additional area under plantation in arable land.

7. National Mission for Sustaining Himalayan Ecosystems	<ul style="list-style-type: none"> - To continuously assess the health status of the Himalayan Ecosystem - Enable policy bodies in their policy formulation functions - Establish new centres relevant to climate change in existing institutions in Himalayan States - Regional cooperation with neighbouring countries in Glaciology 	<ul style="list-style-type: none"> - Centre for Glaciology has been established at Wadia Institute of Himalayan Geology - State climate change centres have been set up in 12 Himalayan states - State climate change cells have been established in 11 out of 12 Himalayan states - 40 capacity building training programmes have been conducted and 40,000 people have been trained. Glaciologists have been trained under Indo-Swiss Capacity Building Programme in glaciology - an Inter-University Consortium of 4 universities on Himalayan Cryosphere and Climate Change has been formed - Glacial lake outburst floods R&D studies for vulnerability assessment have been conducted for Sikkim
8. National Mission on Strategic Knowledge for Climate Change (NMSKCC)	<ul style="list-style-type: none"> - To gain better understanding of climate science and formation of knowledge networks among existing knowledge institutions engaged in research and development (R&D) - Development of national capacity for modelling the regional impact of climate change on different ecological zones within the country. 	<ul style="list-style-type: none"> - The mission has created and strengthened 11 Centres of Excellence for climate change. - State Climate Change Cells have been established in 11 out of 12 Himalayan States and in 11 non-Himalayan States. - 6 lead institutions now conduct training on climate change science, impacts and adaptation under its human capacity building programme. - Revised mission document aims to establish 20 centres of excellence, state climate change cells in all states/UTs, develop major R&D programmes, human capacity building programmes, national level network programmes and international cooperation

B) CLIMATE CHANGE ACTION PLAN (CCAP)

- It is a central sector scheme, initially launched in 2014, with a **total outlay of ` 290 crores for duration of five years**. The scheme has now been **extended upto 2025-26**, and consists of eight broad sub-components including the National Action Plan on Climate Change (NAPCC) coordination, State Action Plan on Climate Change (SAPCC), National Institute on Climate Change Studies & Actions, National Carbonaceous Aerosols Programme (NCAP), Long Term Ecological Observations (LTEO), International negotiations and capacity building.

C) NATIONAL ADAPTATION FUND ON CLIMATE CHANGE

- Launched in 2015
- To help India take climate actions and finance adaptation efforts domestically
- **30** projects focused on climate sensitive sectors such as agriculture, water, forestry as well as the coastal and Himalayan ecosystem, and are being implemented to enhance the adaptive capacity of the most vulnerable sections of our population and ecosystems.

D) NATIONAL HYDROGEN MISSION

- India has announced the **National Hydrogen Mission for generating hydrogen from green energy sources**. Through technological advancements, **hydrogen is being blended with CNG for use as transportation fuel** as well as an industrial input to refineries.

E) ETHANOL BLENDING

- On June 5, 2021, the Hon'ble Prime Minister **announced 20 per cent ethanol blending in petrol by 2025**.
- The ambitious target, which brings forward the blending target from 2030 to 2025, is a key element of the economy-wide energy transformation.
- As of September 2021, the country has already reached 8.5 per cent ethanol blending and is on track to achieve the 20 per cent target by 2025.
- **Benefits:**
 - o Saving USD 4 billion foreign exchange per year in imports
 - o enhancing energy security
 - o lowering carbon emissions
 - o improving air quality
 - o promoting productive use of damaged food grains and waste
 - o increasing farmers' incomes
 - o creating employment and investment opportunities.
- The Government is expecting an investment of up to USD 5,541 million to help India achieve its ethanol blending target of 10 per cent by 2022 and 20 per cent by 2025.

F) INDIAN RAILWAYS TARGET NET ZERO CARBON EMISSION BY 2030

- **How? Primarily by** sourcing its energy requirements through renewable energy sources.
- Major initiatives undertaken for reduction of carbon emissions include:
 - o **100 per cent electrification of its network by December 2023**,
 - o use of three phase technology for regenerative braking, "head on generation" technology eliminating the need for separate diesel fuelled power cars,
 - o use of renewable energy source (133.26 MW solar and 103 MW wind installed capacity)
 - o provisioning of LED lights at all railway installations, and creation of additional carbon sink by afforestation. Figure below shows the expected CO2 emission reduction by Indian Railways through use of renewable energy.

G) PM KUSUM (INDIA HAS LAUNCHED PRADHAN MANTRI URJA SURAKSHA EVAM UTTAN MISSION)

- To provide energy and water security, de-dieselise the farm sector and generate additional income for farmers by producing solar power.
- The **scheme aims to add 30.8 GW of solar capacity with central financial support of over ` 34,000 Crore**
- The scheme has **three components**:
 - a) **Installation of 10,000 MW of decentralized grid connected power plants** each of capacity upto 2 MW
 - b) **Setting up of 20 lakh standalone solar powered agriculture pumps**
 - c) **Solarisation of 15 Lakh existing grid-connected agriculture pumps**
- RBI has included all three components under PSL.
- **Progress:** As of 31st December 2021, over 77000 stand-alone solar pumps, 25.25 MW capacity solar power plants and over 1026 pumps were solarised under individual pump solarisation variant. Implementation of feeder level solarisation variant under component C which was introduced in December 2020 has also started in several states.

H) DEVELOPMENT OF SOLAR PARKS AND ULTRA MEGA SOLAR POWER PROJECTS

- It is under implementation with a target capacity of 40 GW capacity by March 2024.
- So far, 50 solar parks have been sanctioned with a combined capacity of 33.82 GW in 14 states. Solar power projects of an aggregate capacity of around 9.2 GW have already been commissioned in these parks

I) ROOFTOP SOLAR PROGRAM PHASE-II

- For accelerated deployment of solar roof top systems, with a target of 40 GW installed capacity by December 2022, is also under implementation. The scheme provides for financial assistance for upto 4 GW of solar roof top capacity to residential sector and there is a provision to incentivise the distribution companies for incremental achievement over the previous year. So far, a cumulative 5.87 GW solar roof top projects have been set up in the country

J) A SCHEME FOR SETTING UP 20 GW GRID-CONNECTED SOLAR POWER PROJECTS BY GOVERNMENT ENTITIES (INCLUDING CPSUS)

- VGF is being provided under the scheme

K) PHASE-III OF THE OFF-GRID SOLAR PV APPLICATIONS PROGRAM FOR SOLAR STREET LIGHTS, SOLAR STUDY LAMPS AND SOLAR POWER PARKS

- Till Dec 2021, over 1.45 lakh solar street lights were installed, 9.14 lakh solar study lamps were distributed, and about 2.5 MW solar power packs were set up.

L) OFFSHORE WIND ENERGY POLICY

- To harness the potential of offshore wind energy along India's coastline.
- MNRE is developing strategy and roadmap for installation of offshore wind projects off the coast of Gujarat and Tamil Nadu.

M) SOLAR HYBRID POLICY

- The MRE has notified wind solar hybrid policy, providing a framework for promotion of large grid connected wind-solar PV hybrid projects for optimal and efficient utilization of transmission infrastructure and land, reducing the variability in renewable power generation and achieving better grid stability. As of 31st December 2021, capacity of around 4.25 GW of wind-solar hybrid have been awarded, out of which 0.2 GW is already commissioned and additional capacity of 1.2 GW wind-solar hybrid projects are at various stages of bidding

9) KEY OUTCOMES OF COP26

- **Expectation from CoP26:**
 - » **Official agenda** was to finalize **rules and procedures** for implementation of the Paris Agreement. It was left incomplete in 2018. The countries were yet to agree on some of the provisions related to creation of new carbon markets (especially the issue of **unsold Certified Emission Reductions (CERs)**).
 - » **Finding a way to scale up climate finance**
 - It has been a decade and the developed nations have failed to deliver. (Developed countries were supposed to mobilize \$100 billion in climate finance annually till 2025)
 - » **Raising global ambitions** for bolder emission reduction targets and eventually **achieve net zero**.
 - More than 50 countries have pledged to carbon-neutrality by middle of the century.
- **Outcomes:**
 - » The **Glasgow Climate Pact** is a **mixed bag of modest achievements and disappointed expectations**.
- **Positive outcomes:**
 - » **Towards better Mitigation:**
 - The Glasgow agreement has emphasized on a target of 1.5 degree C and that stronger action in the current decade is crucial for achieving this target.
 - It has asked countries to **strengthen their 2030 climate action plan or NDCs by 2022**.
 - The pact is the **first clear recognition of the need to move away from the fossil fuels**. It has called for **"phase down"** of unabated coal power and phase out of inefficient fossil fuel subsidies.
 - As many as 29 countries committed to end **international public finance** for unabated oil, gas, and coal production by the end of 2022.
 - » **Towards Better Adaptation:**
 - The Glasgow pact asks developed countries to **atleast double the money being provided for adaptation by 2025** from the 2019 levels.
 - It has also created a **two year Work Program** to define a goal on adaptation. (Please note that the Paris Agreement has a global goal on mitigation, but a similar goal on adaptation is missing).
 - » **Paris Rule Book has been finalized**
 - **'Transparency Framework'** was completed. This includes reporting rules and formats for emissions, progress on pledges and financial contributions.
 - » **Carbon Market provisions** have been **finalized** (after 6 years of negotiations). This is one of the major achievements of the COP26.
 - **Credit generated from earlier periods**, including through Clean Development Mechanism were transferred to the Paris Agreement but only since 2013. This will allow developing countries to meet its first NDC targets.
 - On the **issue of double counting**, it has been decided that a country that generates a credit will decide whether to authorize it for sale to other nations or to count towards their climate targets. The emission cuts will be **counted only once**.
 - The final deal agreed that a share of proceeds from each trade will go to developing countries for adaptation.
 - This share is 5% in case of new Centralized carbon market and voluntary in case of bilateral trades.
- **Various Positive "Parallel Outcomes"** (not part of the official COP26 negotiations)

- **India's announcement of a Panchamitra** (a mixture of five elements) of climate action. These are **more ambitious targets** including Net Zero by 2070; Reduction in emission by 1 billion tonnes by 2030; Reducing Emission intensity by 45% by 2030 etc.
- **Several other countries** have also announced enhanced climate actions.
 - For e.g.
 - Brazil advanced its net zero target to 2050 (from 2060)
 - China has promised to come up with a detailed roadmap for its commitment to let emissions peak in 2030 and also for its 2060 net zero target.
- **Plurilateral Agreement on Methane Reduction** among 100 countries is crucial. (Note: India is not a member)
- **Plurilateral Agreement to reverse deforestation** among another group of 100 countries. (Note: India didn't join the group due to concerns over a clause on possible trade measures related to forest products).
- **COP26 Transport Declaration** -> 100% transition to emission less (electric vehicles) cars by 2040.
 - This has also been signed by over 30 countries.
- **Glasgow Financial Alliance for Net Zero (Gfanz)**: 450 of the world's banks and other financial institutions have pledged to report annually on the carbon emissions linked to the projects they lend to.
 - They also plan to lend trillions of dollars in green finance - while committing to net zero emission across the board by 2050.
- **Negative:**
 - **An upward increase in climate finance goal has been missed.**
 - It has now been estimated that trillions of dollars are required every year to fund all the actions necessary to achieve the climate targets.
 - In 2009, the developed countries promised (due to their historical responsibility) to provide at least \$100 billion every year from 2020. This promise was reaffirmed in Paris Agreement which also asked developed countries to scale up this amount from 2025.
 - The 2020 deadline has passed, but the \$100 billion promise hasn't been met.
 - The Glasgow agreement expressed "deep regrets" over the failure of the developed countries to deliver on their \$100 billion promise. It has asked them to arrange this money urgently and in every year till 2025.
 - The negotiations here have also initiated discussions on setting the new target for climate finance, beyond, \$100 billion for the post-2025 period.
 - **Issue of Compensation for loss and damages** for developing countries - received at most a lip service.
 - This has become part of multilateral discourse and the US has agreed that it should be examined by the working groups. But, any meaningful flow of the fund is still far away.
 - Though the COP-26 acknowledged that the threat of climate change is real and urgent actions are needed. But, it didn't explicitly raise commitments to cut greenhouse gas emissions.
 - **Ensuring effective implementation** of the short-term 2030 target still remain difficult as very little attention has been given to it and the entire focus was on net zero target of 2050.
 - The submit also re-highlighted the **deep distrust** between the already rich and emerging world.
- **China** which is the largest emitter, hasn't been given any reduction targets and thus it will end up consuming 33% of the carbon budget for this decade

10) INDIA'S DECISION TO ADOPT NET ZERO

- At COP26, PM Modi has proposed a **five fold strategy** for India to play its part in helping the world get closer to 1.5 degrees Celsius. India's 'Panchamrita' promises include:
 - » India will get its non-fossil energy capacity to 500 GW by 2030.
 - » This is a 50 GW increase from its existing target.

- » India will meet 50% of its energy requirements till 2030 with renewable energy.
- » India will reduce its projected carbon emission by one billion tonnes by 2030.
- » India will achieve net zero by 2070.

- **India's demand from developed countries:**

In the spirit of **climate justice**, the developed countries should be providing **at least \$1 trillion** in climate finance to assist the developing countries and those most vulnerable

11) INDIA'S INITIATIVES AT THE INTERNATIONAL STAGE

A) LIFESTYLE FOR ENVIRONMENT (LIFE)

In Nov 2021, PM Modi proposed a **One-Word Movement in the context of climate: LIFE** - Lifestyle for Environment, at the COP 26 in Glasgow. This movement calls for coming together with collective participation, to take lifestyle for environment forward as a campaign and as a mass movement for environmentally conscious life style in a manner that revolutionizes many sectors and diverse areas such as fishing, agriculture, wellness, dietary choices, packaging, housing, hospitality, tourism, clothing, fashion, water management and energy.

B) INTERNATIONAL SOLAR ALLIANCE (ISA)

- In November 2021, the Hon'ble Prime Minister launched the **joint Green Grids Initiative- One Sun One World One Grid (GGI –OSOWOG)** at the World Leaders' Summit in Glasgow. It aims to create a globally inter-connected green grid, building upon existing regional grid infrastructure, which will enable solar energy generation in regions with high potential and its evacuation to demand centres. A joint GGI-OSOWOG Secretariat is being planned to be established at the ISA Secretariat to mobilize political support and render technical support for the initiative.
- ISA has attained a **Permanent Observer Status at the UN General Assembly**.
- It has signed a MoU with UNFCCC at COP 26 to support ISA membership in developing a roadmap for, and implementing, their respective NDCs under the Paris Agreement.
- ISA is mandated to facilitate mobilization of USD 1 trillion in solar investments by 2030 for massive scale-up of solar energy deployment.
- The Strategic Plan of the ISA for 2021-2026 identifies three key global issues – Energy Access, Energy Security, and Energy Transition.
 - » In this regard, ISA has **launched eight thematic programmes** to address the above issues and an overarching programme to facilitate mobilization of affordable finance for large-scale deployment of solar energy across ISA membership. ISA supports its membership across four pillars encompassing programmatic support, capacity building and ecosystem readiness, risk mitigation instruments, and analytics and advocacy

C) COALITION FOR DISASTER RESILIENT INFRASTRUCTURE

- India's call for promoting disaster resilience of infrastructure through the Coalition for Disaster Resilient Infrastructure (CDRI) has been receiving global attention. Since CDRI's launch in Sep 2019, its membership has expanded to 28 countries and seven multilateral organization with several member countries committing to provide tech assistance and financial resources.
- In March 2021, the PM of India, UK, Italy and Fiji launched the third International Conference on Disaster Resilient Infrastructure (ICDRI), which discussed key global issues around resilience of critical infrastructure sectors.

- In Nov 2021, India, UK, Australia, Fiji, Jamaica and Mauritius launched the **Infrastructure for Resilient Island States (IRIS)**. This is a dedicated initiative for Small Island Developing States (SIDS) that provides quality technical and financial services to make SIDS infrastructure resilient to climate change and disaster events. India has pledged USD 10 million, while Australia and the UK have pledged AUD 10 million GBP 7.3 million respectively for the IRIS initiative
- CDRI has launched **two other initiatives.**
 - » **CDRI's Global Flagship Report on Disaster and Climate Resilient Infrastructure** aims to engage and focus global attention on the critical and multi-faceted challenges posed to disaster and climate-resilient infrastructure.
 - » **DRI Connect** is a "network of networks" enabling stakeholder access to knowledge resources and collaborative opportunities with their peers and other actors. These initiatives are in addition to CDRI's ongoing programmes on enhancing the power sector's resilience in Odisha and the global study on disaster resilience of airports

D) LEADERSHIP GROUP FOR INDUSTRY TRANSITION (LEADIT GROUP)

- Launched by India and Sweden, with support from WEF in 2019
- It is one of the nine action tracks identified by the UN Secretary-General to boost climate ambitions and actions to implement the Paris Agreement.
- In November 2021, the Joint Ministerial Statement released at the Leadership Summit called countries and companies to come out with roadmaps for deep reductions in emissions across all heavy industries and value chains in the coming decade.