

BIODIVERSITY AND ENVIRONMENT**STATE OF INDIA'S SOLAR CAPACITY**

India added a record 10 Gigawatt (GW) of solar energy to its cumulative installed capacity in 2021.

- This has been the highest 12-month capacity addition, recording nearly a 200% year-on-year growth.
- India has now surpassed 50 GW of cumulative installed solar capacity, as on 28th February 2022.
- Of the 50 GW installed solar capacity, an overwhelming 42 GW comes from ground-mounted Solar Photovoltaic (PV) systems, and only 6.48 GW comes from Roof Top Solar (RTS); and 1.48 GW from off-grid solar PV.

What is the Significance of the Achievement?

- This is a milestone in India's journey towards generating 500 GW from renewable energy by 2030, of which 300 GW is expected to come from solar power.
- India's capacity additions rank the country fifth in solar power deployment, contributing nearly 6.5% to the global cumulative capacity of 709.68 GW.

Why is India falling short in Roof-top Solar Installations?

- **Fails to Exploit the Benefits of Decentralised Renewable Energy:**
 - ❖ The large-scale solar PV focus fails to exploit the many benefits of Decentralised Renewable Energy (DRE) options, including reduction in Transmission and Distribution (T&D) losses.
- **Limited Financing:**
 - ❖ One of the primary benefits of solar PV technology is that it can be installed at the point of consumption, significantly reducing the need for large capital-intensive transmission infrastructure.
 - ❖ This is not an either/or situation; India needs to deploy both large and smaller-scale solar PV, and particularly needs to expand RTS efforts.
 - ❖ However, there is limited financing for residential consumers and Small and Medium Enterprises (SMEs) who want to install RTS.
- **Lukewarm Responses from Electricity Distribution Companies (DISCOMS):**
 - ❖ Lukewarm responses from electricity Distribution Companies (DISCOMS) to supporting net metering, RTS continues to see low uptake across the country.

What are the Challenges to India's Solar Power Capacity Addition?

- Despite significant growth in the installed solar capacity, the contribution of solar energy to the country's power generation has not grown at the same pace.
- In 2019-20, for instance, solar power contributed only 3.6% (50 billion units) of India's total power generation of 1390 BU.
- The utility-scale solar PV sector continues to face challenges like land costs, high T&D losses and other inefficiencies, and grid integration challenges.
- There have also been conflicts with local communities and biodiversity protection norms. Also, while India has achieved record low tariffs for solar power generation in the utility-scale segment, this has not translated into cheaper power for end-consumers.
- The International Renewable Energy Agency (IRENA) estimates that the global value of recoverable materials from solar PV waste could exceed USD15 billion.
- Currently, only the European Union has taken decisive steps in managing solar PV waste.
- India could look at developing appropriate guidelines around Extended Producer Responsibility (EPR), which means holding manufacturers accountable for the entire life cycle of solar PV products and creating standards for waste recycling.
 - ❖ This could give domestic manufacturers a competitive edge and go a long way in addressing waste management and supply side constraints.

What is the state of India's Domestic Solar Module Manufacturing Capacity?

- Domestic manufacturing capacities in the solar sector do not match up to the present potential demand for solar power in the country.

- ❖ India had 3 GW capacity for solar cell production and 8 GW for solar panel production capacity. Moreover, backward integration in the solar value chain is absent as India has no capacity for manufacturing solar wafers and polysilicon.
- ❖ In 2021-22, India imported nearly USD 76.62 billion worth of solar cells and modules from China alone, accounting for 78.6% of India's total imports that year.
- ❖ Low manufacturing capacities, coupled with cheaper imports from China have rendered Indian products uncompetitive in the domestic market.
- This situation can, however, be corrected if India embraces a circular economy model for solar systems.
 - ❖ This would allow solar PV waste to be recycled and reused in the solar PV supply chain. By the end of 2030, India will likely produce nearly 34,600 metric tonnes of solar PV waste.

SCIENCE AND TECHNOLOGY

Deep Ocean Mission (DOM), Blue Economy

Recently, the Ministry of Earth Sciences has launched the Deep Ocean Mission (DOM).

- DOM is a mission mode project to support the Blue Economy Initiatives of the Government of India.
- Earlier, the Ministry of Earth Sciences had also rolled out the draft Blue Economy Policy.
- Blue Economy is the sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health.

What are the Major Components of DOM?

Development of Manned Submersible Vehicle:

- A manned submersible will be developed to carry three people to a depth of 6,000 metres in the ocean with a suite of scientific sensors and tools.
- NIOT & ISRO is jointly developing a Manned Submersible Vehicle.
- National Institute of Ocean Technology (NIOT), an autonomous institute under the Ministry of Earth Sciences.

Development of Technologies for Deep Sea Mining:

- An Integrated Mining System will be also developed for mining polymetallic nodules at those depths in the central Indian Ocean.
 - ❖ Polymetallic nodules are rocks scattered on the seabed containing iron, manganese, nickel and cobalt.
- The exploration studies of minerals will pave the way for commercial exploitation in the near future, as and when commercial exploitation code is evolved by the International Seabed Authority, a United Nations (UN) organisation.

Development of Ocean Climate Change Advisory Services:

- It entails developing a suite of observations and models to understand and provide future projections of important climate variables on seasonal to decadal time scales.

Technological Innovations for Exploration and Conservation of Deep-sea Biodiversity:

- Bio-prospecting of deep-sea flora and fauna including microbes and studies on sustainable utilisation of deep-sea bio-resources will be the main focus.

Deep Ocean Survey and Exploration:

- It will explore and identify potential sites of multi-metal Hydrothermal Sulphides mineralization along the Indian Ocean mid-oceanic ridges.

Energy and Freshwater from the Ocean:

- Studies and detailed engineering design for offshore Ocean Thermal Energy Conversion (OTEC) powered desalination plants are envisaged in this proof of concept proposal.
- OTEC is a technology that uses ocean temperature differences from the surface to depths lower than 1,000 metres, to extract energy.

Advanced Marine Station for Ocean Biology:

- It is aimed at the development of human capacity and enterprise in ocean biology and engineering.
- It will translate research into industrial application and product development through on-site business incubator facilities.

What is the Significance of DOM?

- **Leveraging Ocean Resources:** Oceans, which cover 70% of the globe, remain a key part of our life. About 95% of the Deep Ocean remains unexplored.
 - ❖ Three sides of India are surrounded by the oceans and around 30% of the country's population lives in coastal areas, the ocean is a major economic factor supporting fisheries and aquaculture, tourism, livelihoods and blue trade.
 - ❖ Considering the importance of the oceans on sustainability, the UN has declared the decade, 2021-2030 as the Decade of Ocean Science for Sustainable Development.
- **Long Coastline:** India has a unique maritime position. Its 7517 km long coastline is home to nine coastal states and 1382 islands.
 - ❖ The Government of India's Vision of New India by 2030 announced in February 2019 highlighted the Blue Economy as one of the ten core dimensions of growth.
- **Technology Expertise:** The technology and expertise needed in such missions are now available in only five countries - the US, Russia, France, Japan and China.
 - ❖ India will now be the sixth country to have it.

What are other Blue Economy Initiatives

India-Norway Task Force on Blue Economy for Sustainable Development:

- ❖ It was inaugurated jointly by both the countries in 2020 to develop and follow up joint initiatives between the two countries.

Sagarmala Project:

- ❖ The Sagarmala project is the strategic initiative for port-led development through the extensive use of IT-enabled services for the modernization of ports.

O-SMART:

- ❖ India has an umbrella scheme by the name of O-SMART which aims at regulated use of oceans, marine resources for sustainable development.

Integrated Coastal Zone Management:

- ❖ It focuses on the conservation of coastal and marine resources, improving livelihood opportunities for coastal communities etc.

National Fisheries Policy:

- ❖ India has a National Fisheries policy for promoting the 'Blue Growth Initiative' which focuses on sustainable utilisation of fisheries wealth from marine and other aquatic resources.

IMPORTANT FACTS FOR PRELIM

International Day to Combat Islamophobia

Recently, the UN General Assembly approved a resolution for setting March 15th as the International Day to Combat Islamophobia.

- The resolution was introduced by Pakistan on behalf of the Organisation of Islamic Cooperation (OIC).
- Though the resolution has been passed at UNGA, India has highlighted several concerns.

What are the Key Points of the Resolution?

- The resolution, adopted by consensus by the 193-member world body and cosponsored by 55 mainly Muslim countries.
- The resolution asks all countries, U.N. bodies, international and regional organisations, civil society, private sector and faith-based organisations “to organise and support various high-visibility events aimed at effectively increasing awareness of all levels about curbing Islamophobia.
- The resolution emphasizes the right to freedom of religion and belief and recalls a 1981 resolution calling for “the elimination of all forms of intolerance and of discrimination based on religion or belief”.

What is India’s Stand?

- India expressed concern over phobia against one religion being elevated to the level of an international day, saying there are growing contemporary forms of religiophobia, especially anti-Hindu, anti-Buddhist and anti-Sikh phobias.
- It also cited that that word ‘pluralism’ finds no mention in the resolution.

- India hopes the resolution adopted "does not set a precedent" which will lead to multiple resolutions on phobias based on selective religions and divide the United Nations into religious camps.
- The term Islamophobia does not have any agreed definition in international law, contrary to the freedom of religion or belief.

What is International Day Commemorating the Victims of Acts of Violence Based on Religion or Belief?

- Earlier in 2019, UNGA has also passed a resolution to celebrate August 22nd, International Day Commemorating the Victims of Acts of Violence Based on Religion or Belief.
- Its resolution envisages recognizing the importance of providing victims of acts of violence based on religion or belief and members of their families with appropriate support and assistance in accordance with applicable law.

DAILY ANSWER WRITING PRACTICE

Q1. Water stress causes deterioration of fresh water resources in terms of quantity as well as quality. Suggest steps to overcome water stress in the country. (250 words)Introduction

Water stress occurs when the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. When per capita availability of water is below 1700 m³/year, water availability is termed as "stressed".

BODY

Water stress causes deterioration of fresh water resources in terms of quantity as well as quality

- India has 4 % of the world's freshwater which has to cater to 17 % of the world's population.
- Approximately 600 million people or roughly around 45 % of the population in India is facing high to severe water stress.
- As per the report, 21 Indian cities will run out of their main source of water i.e. groundwater by 2020.
- Nearly 40 % of the population will have absolutely no access to drinking water by 2030 and 6 % of India's GDP will be lost by 2050 due to the water crisis.
- As per NITI Aayog report (CWMI) released in June 2019, India is facing the worst-ever water crisis in history.
- A disastrous water crisis has been creeping up on us for years. Water tables have declined precipitously, even by thousands of feet in some parts of Punjab, Haryana and Andhra Pradesh. Tanks and wells have gone dry.
- Some rivers have shrunk while other smaller ones have completely dried up.
- Water rationing is routine in many urban areas, while in many villages women are trudging longer distances to fetch water.
- A recent report mentions that over 70% of surface irrigation water is being simply wasted, nationally.
- Not only farmers are affected by the water crisis, urban dwellers in cities and towns across India are also facing a never seen before drinking water scarcity.
- In India, there are conflicts between Karnataka and Tamil Nadu over sharing of Cauvery waters, between Gujarat and Madhya Pradesh over sharing of Narmada waters, between Andhra Pradesh and Telangana over sharing of Krishna waters, etc.

Measures to overcome water stress in the country

Seeing India's looming water crisis through the locus of 'urban' and 'rural' not only allows a better grasp of the causative factors but also enables a stronger grip on the strategies to be deployed to reverse the water crisis.

- **Urban water resource management**
- Ground water management is of utmost importance in urban areas where 50% water is drawn from ground. E.g.: Encroachment of flood plains, ground water recharge are areas to work with.
- Loss of green cover in urban areas and heat island effect are reasons for depleting water sources. e.g.: Urban forests needs to be created like in Aarey, Mumbai.

- The Ministry of Water Resources must reconfigure its relationship with other Ministries and Departments (Urban Development, Local Self-Government and Environment).
- Enhanced integration and coordination are needed through effective land and water zoning regulations that protect urban water bodies, groundwater sources, wetlands and green cover while simultaneously working to enhance waste water recycling and water recharge activities targeting aquifers and wells through rainwater harvesting.

Rural water resource management

- Water and food security: At the sectoral level, the Ministries and Departments of water resources must coordinate efforts with their counterparts in agriculture, the environment and rural development for greater convergence to achieve water and food security.
- g.: Water guzzler crops like paddy and wheat in Punjab have turned the soil saline and depleted ground water.
- Whole of government approach: At the disciplinary level, governance and management should increasingly interact and draw from the expertise of fields such as hydrology (watershed sustainability), hydrogeology (aquifer mapping and recharge) and agriculture sciences (water-sensitive crop choices and soil health).
- Surface water management: Again, the importance given to groundwater conservation should not ignore surface water conservation including the many rivers and lakes which are in a critical and dying state due to encroachment, pollution, over-abstraction and obstruction of water flow by dams.

Findings

- Effective land and water zoning regulations would protect urban water bodies, groundwater sources, wetlands and green cover.
- Enhance waste water recycling and water recharge activities targeting aquifers and wells through rainwater harvesting.
- Governance and management should increasingly interact and draw from the expertise of fields such as hydrology (watershed sustainability), hydrogeology (aquifer mapping and recharge) and agriculture sciences (water-sensitive crop choices and soil health).
- The importance given to groundwater conservation should not ignore surface water conservation including the rivers and lakes which are in a critical state due to encroachment and pollution.
- The Ministry of Jal Shakti must focus on protecting and conserving water resources on the one hand and minimising and enhancing efficiency of water usage on the other.

DAILY QUIZ

Q1. With reference to the Indian Renewable Energy Development Agency Limited (IREDA), which of the following statements is/are correct? (2015)

1. It is a Public Limited Government Company.
2. It is a Non-Banking Financial Company.

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 only
- (c) **Both 1 and 2**
- (d) Neither 1 nor 2

Q2. If National Water Mission is properly and completely implemented, how will it impact the country? (2012)

1. Part of the water needs of urban areas will be met through recycling of waste-water.
2. The water requirements of coastal cities with inadequate alternative sources of water will be met by adopting appropriate technologies that allow for the use of ocean water.
3. All the rivers of Himalayan origin will be linked to the rivers of peninsular India.
4. The expenses incurred by farmers for digging bore-wells and for installing motors and pumpsets to draw ground-water will be completely reimbursed by the Government.

Select the correct answer using the codes given below:

- (a) 1 only
- (b) **1 and 2 only**

- (c) 3 and 4 only
- (d) 1, 2, 3 and 4

Q3. Consider the following statements:

1. 21st February is declared to be the International Mother Language Day by UNICEF.
2. The demand that Bangla has to be one of the national languages was raised in the Constituent Assembly of Pakistan.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only**
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Q4. Consider the following statements:

1. Oceans, which cover 70% of the globe, remain a key part of our life. About 95% of the Deep Ocean remains unexplored
2. India has 4 % of the world's freshwater which has to cater to 17 % of the world's population.

Select the correct answer code:

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2**
- (d) Neither 1 nor 2

Q5. Consider the following statements:

1. The UN General Assembly approved a resolution for setting March 15th as the International Day to Combat Islamophobia.
2. The resolution emphasizes the right to freedom of religion and belief and recalls a 1981 resolution calling for "the elimination of all forms of intolerance and of discrimination based on religion or belief".

Select the correct answer code:

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2**
- (d) Neither 1 nor 2