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BIG ISSUE

Solar Waste Management in India

Solar energy has become a leading solution to meet the increasing energy demands of the world's growing population. Solar photovoltaic technology is an efficient option to generate electricity from solar energy and mitigate climate change. Although the development and growth of solar photovoltaics (PV) has had a positive impact on energy system de-carbonization, end-of-life solar panels might become toxic waste if not properly disposed of.

■ Ranjeet Shah

Recently, the Ministry of Environment, Forest and Climate Change highlighted the importance of solar waste management in the country by adding solar PV modules panels/ cells in *Chapter V* of the new E-Waste Management Rules of 2022, which came into effect on April 1, 2023.

The new rules have narrowed down the scope of the earlier provisions of *E-Waste Management Rules of 2016*. Moreover, the new rules apply only to manufacturers, producers, refurbishers, dismantlers, and recyclers involved in the manufacture, sale, transfer, purchase, refurbishing, dismantling, recycling, and processing of e-waste or electrical and electronic equipment listed in Schedule I.

Solar is a very compelling energy source for India. Driven by strong political commitment, falling cost, operational simplicity, and high irradiation across the country, solar capacity in India has grown rapidly from just 1 GW in 2012 to 65 GW (as on February 2023). The Indian government has set an ambitious target of achieving 280 GW by March 2030.

However, the advancements have focused only on increasing the efficiency of solar photovoltaic panels without considering the impact of waste solar panels on the environment and the issue of appropriate disposal of waste panels. Effective and ecofriendly methods for recycling end-of-life waste are rarely considered. There is a need to critically investigate and sustainably manage the disposal and recycling of solar panels waste.

What is Solar Waste?

Solar waste refers to the waste generated during the lifecycle of solar photovoltaic (PV) systems, which are used to convert sunlight into electricity. While solar energy is considered a clean and renewable source of power, it is not entirely without adverse environmental impacts.

The production, installation, operation, and decommissioning of solar panels can generate various types of waste. Here are some examples:

- **Manufacturing Waste:** The production of solar panels involves the use of materials such as silicon, metals, glass, and plastics. The manufacturing process can result in the generation of waste materials, including silicon dust, offcuts, and unused or defective panels.
- **End-of-Life Waste:** Solar panels have a lifespan of around 25 to 30 years. When they reach the end of their useful life, they become electronic waste or e-waste. E-waste contains valuable and potentially hazardous materials like lead, cadmium, and other heavy metals. Proper recycling and disposal of old solar panels are essential to prevent environmental contamination.
- **Installation Waste:** During the installation of solar panels, various types of waste can be generated, such as packaging materials, pallets, wiring, and mounting system components. These materials need to be managed appropriately to minimize their impact on the environment.
- **Maintenance Waste:** While solar panels generally require minimal maintenance, occasional repairs or replacements might generate waste materials. This can include damaged or outdated panels, broken glass, wiring, or other components.

Solar Waste in India: Current and Future Scenario

In India, approximately 200,000 tonnes of solar photovoltaic waste are expected to be generated by 2030 and 1.8 million tonnes by 2050. Solar waste could grow to 60 million tonnes globally by 2050. Solar waste has recently been included in the category of waste electrical and electronic equipment to restrict the negative influence of continual development.

India has made significant strides in solar energy adoption in recent years, becoming one of the world's leading countries in solar power generation. With the rapid expansion of solar installations, the issue of solar waste management has gained attention.

Current Scenario

- **Limited Regulations:** India currently lacks specific regulations or guidelines focused on the management of solar waste. The existing regulations primarily address e-waste management, which includes solar panels but does not specifically target them.

Spotlight

India's Logistics Sector

Role of Effective Management in Boosting Economic Development

India aims to become a US$ 5 trillion economy in the near future and a developed economy by 2047. In this direction, connectivity and development of strong logistics infrastructure is of utmost importance. The logistics sector will boost the development of commercial real estate and industrial parks, along with the development of transport and warehousing facilities. This will help better integration of Indian industry with global value chains and make India a manufacturing hub. The logistics industry will play an effective role in making India a developed economy.

■ Dr. Amarjeet Bhargava

India has been ranked 38 out of 139 countries in the Global Logistics Performance Index-2023 published by the World Bank. In the year 2018, India was ranked 44th in this index; its ranking has improved by six places.

In the last few years, the government has taken several steps to improve the logistics sector. These range from providing quick last mile delivery facilities to eliminating challenges of transportation. Sustainable economic development of the country depends on the quality of roads, railways, airports, ports, waterways and better logistics infrastructure.

As a planner, the government better understands the importance of the logistics sector. For this, the central government has doubled the outlay given to the states under the 'PM Gati Shakti National Master Plan' from Rs. 5,000 crore to Rs. 10,000 crore in the Union Budget-2023. Similarly, Rs 2.4 lakh crore has been announced by the government in the budget for the Indian Railways.

The Government is prioritizing a 'Transformational Approach' to reform the logistics sector and address infrastructure challenges. The improved performance seen in India's logistics sector has been possible only because of these corrective steps.

Despite these achievements, widespread concerns have been expressed regarding the fragmented and unorganized nature of country's logistics sector. Even at present, the country's logistics cost is as high as 14%-15% of GDP, which is higher than that of developed countries like Singapore and US (7%-8%). The country suffers export loss due to high cost of logistics sector and other challenges. Therefore, it is necessary to address such issues in order to improve the country's logistics sector.

India's Logistics Sector: An Overview

- Logistics refers to the overall process of management of receiving, storing and transporting resources to their final destination. It includes all the activities of the supply chain such as transportation, warehousing, packaging, inventory management, flow of information, order processing and customer service.

Positive Points

- The Indian logistics industry is growing rapidly due to the flourishing e-commerce market and technological advancements. The contribution of the logistics sector to the GDP in India is estimated to be around 14.4%. This sector acts as the backbone for various businesses and around 22 million people are employed in this sector.
- India's logistics sector to be worth US$ 250 billion in 2021 (US$ 190 billion in 2019). The government has set a target of achieving a healthy growth rate of 10%-12% annually and taking the sector to US$ 380 billion by the year 2025.
- Similarly, the government plans to reduce logistics and supply chain costs in India from 13-14% of GDP to 10% by industry standards.
- The development of the logistics sector is also reflected in the fact that, in the 'Digital and Sustainable Trade Facilitation Global Survey-2021' of 'United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)' India got a score of 90.3%. The earlier results of this survey suggest that India has steadily improved its position. India's score was 63.4%, 67.7% and 78.5% in the years 2015, 2017 and 2019 respectively.

Need for Improvement

- The logistics sector is considered vital for the efficient movement of products and services across the country and to global markets. At present, the country's logistics business is highly fragmented and has over 1,000 active participants. Key partners include major local players as well as global entrepreneurs, the express division of the government postal service, and emerging start-ups focused on e-commerce delivery.
- According to KPMG International Limited, road (73%) accounts for the largest share of India's logistics industry, followed by railways (18%), waterways (5%) and airways (5%).
- Similarly, there is a wide variation in the share of formal (10%) and informal sector (90%) in the country's

Spotlight

Judicious Use of Mineral Resources

Ensuring Growth, Sustainability and Balanced Regional Development

The exploitation of mineral resources is irreversible, and minerals themselves are non-renewable. However, unlike natural hydrocarbons, many metals and industrial minerals can be recycled. This ability of recycling is now contributing to the growing sector of secondary raw materials and is a major evolution towards mineral sustainability. Mineral resources illustrate the difficulty of satisfying the conflicting objectives of the three pillars of sustainability: economy, environment, and social equity.

■ Sharmila Senthil Kumar

On 28th June, 2023, India officially released its first-ever Critical Minerals List, identifying 30 key critical minerals crucial to the nation's economic growth and technological development. The release of the Critical Minerals List marks a milestone in India's pursuit of self-reliance and security in the domain of mineral resources.

The list is designed to identify and prioritize minerals that are essential for various industrial sectors such as high-tech electronics, telecommunications, transport, and defence. It will serve as a guiding framework for policy formulation, strategic planning and investment decisions in the mining sector. Further, this initiative aligns with the larger vision of achieving 'Net Zero' target for India through Government's commitment for creating a robust and resilient mineral sector.

Minerals are non–renewable natural resources that are vital for a number of industries. The aim of sustainable mineral development is to ensure mineral use is kept to a minimum amount without having a negative impact on economic growth. This can be achieved by efficient use of minerals as well as recycling and the use of alternative materials.

Also, it is important that the natural environment is protected from damage that may be caused by mineral extraction. This will help maintain biodiversity and ensure that contamination is not a problem for future generations. In this context, judicious use of mineral resources assumes great significance.

Mineral Resources and their Importance

A mineral is a naturally occurring substance of definite chemical composition and recognizable physical properties. According to statistics, more than 95% of the energy used by humans, 80% of the raw materials used in industry, and 70% of the raw materials used in agricultural production come from mineral resources.

Raw Material: Minerals provide us with the raw materials used for building structures (clay, steel from iron), electronics (copper, gold, rare earth elements) or tools. Fossil fuels and uranium provide us with energy, and phosphates enhance agriculture.

- **Energy Minerals:** These are used to produce electricity, fuel for transportation, heating for homes and offices and in the manufacture of plastics. Energy minerals include coal, oil, natural gas and uranium.
- **Metals:** Minerals such as iron (as steel) are used in cars or for frames of buildings, copper is used in electrical wiring, lithium in rechargeable batteries, and aluminium in aircraft and to make drink cans. Precious metals are used in jewellery and mobile phones.
- **Construction Minerals:** Minerals including sand and gravel, brick clay and crushed rock aggregates are used to manufacture concrete, bricks and pipes and in building houses and roads.
- **Industrial Minerals:** These are used in a range of industrial applications including the manufacture of chemicals, glass, fertilisers and fillers in pharmaceuticals, plastics and paper. Industrial minerals include salt, clays, graphite, limestone, silica sand, phosphate rock, talc and mica.

Foreign Exchange: Minerals contribute towards increasing foreign exchange earnings.

Human Development: The higher levels of fiscal revenues from minerals help build infrastructure and develop human capital; this in turn has been shown to lead to the development or expansion of other non-mining related industries.

Minerals and SDGs

- The mineral resource sector has the potential to contribute significantly to the achievement of the SDGs through socio-economic benefits. An inclusive and equitable approach towards mineral resource management can help in this regard.

Importance of Judicious Use of Minerals

The increase in human population and improved standards of living are associated with the growth in the consumption of energy and raw materials. The development of new technologies has further enhanced our ability to extract the available resources to match the demand.

Issue Analysis

India's Groundwater Challenge

Imperatives for Conservation and Management for Future Water Security

India's groundwater resource plays a crucial role in sustaining the nation's water needs, but its current state calls for urgent conservation and effective management. With increasing water scarcity and the looming threat of future water security, it is imperative to address the challenges and adopt sustainable measures to protect and optimize this valuable resource.

■ Chandrakant Singh

A recent study published on 15th June, 2023, in *Geophysical Research Letters* revels that the net water lost from underground reservoirs between 1993 and 2010 has caused the geographic North Pole to shift at a speed of 4.36 centimetres per year towards the east.

The same study also reveals nearly 2,150 billion tonnes of groundwater has been pumped and drained into the oceans between 1993 and 2010, making it one of the important contributors to global sea-level rise.

Although the shift is not significant enough to have real-life consequences, the study shows that humans have extracted so much water from the ground that it has impacted the planet's axis and contributed to global sea level rise.

Moreover, the study specifically highlighted the alarming depletion of ground water particularly in mid latitude region i.e. in northwestern India and in western North America.

Thus, the above study draws attention towards unsustainable extraction of groundwater resources in India and its possible consequences.

Significance of Groundwater as a Resource

Groundwater refers to the water that is stored beneath the Earth's surface in saturated soil and rock layers, known as aquifers. It is one of the Earth's most important natural resources and plays a significant role in sustaining ecosystems, supporting human activities, and providing drinking water to millions of people worldwide.

The significance of groundwater as a resource can be summarized in the following points:

- **Drinking Water Supply**: Groundwater serves as a vital source of drinking water for many communities around the world.
- **Agriculture**: Groundwater plays a crucial role in irrigation, especially in areas with limited rainfall or unreliable surface water sources.
- **Industrial Use**: Many industries rely on groundwater for their operations. It is used for processes such as cooling, manufacturing, and as a component in various products.
- **Ecosystem Support**: Groundwater sustains numerous ecosystems, including wetlands, springs, and streams. It contributes to the flow of water in rivers and maintains base flows during dry periods.
- **Resilience during Droughts:** Groundwater can act as a natural buffer during droughts or periods of low rainfall.
- To ensure the sustainability of groundwater resources, it is essential to manage them responsibly.

Ground Water Resource in India

Ground water in India is found in three major hydrogeological settings:

i) **Aquifers of Northern Himalayan Region**: The highly rugged mountainous terrain in the Himalayan region in the northern part of the country extending from Kashmir to Arunachal Pradesh is characterized by steep slopes and high runoff.
   - Though this area offers very little scope for groundwater storage, it acts as the major source of recharge for the vast Indo-Gangetic and Brahmaputra alluvial plains.

ii) **Aquifers of Indo-Gangetic-Brahmaputra Alluvial Plains**: This region encompasses an area covering states of Punjab, Haryana, Uttar Pradesh, Bihar, Assam and West Bengal, accounting for more than one fourth of country's land area, comprises the vast plains of Ganges and Brahmaputra rivers and are underlain by thick piles of sediments of Tertiary and Quaternary age.
   - This vast and thick alluvial fill, exceeding 1000 m at places, constitutes the most potential and productive ground water reservoir in the country.

iii) **Aquifers of Peninsular Shield Area**: These are located south of Indo-Gangetic-Brahmaputra plains and consist mostly of consolidated sedimentary rocks, Deccan Trap basalts and crystalline rocks in the states of Karnataka, Maharashtra, and Tamil Nadu, Andhra Pradesh, Orissa and Kerala.
   - Occurrence and movement of ground water in these formations are restricted to weathered residuum and interconnected fractures at deeper levels and they have limited ground water potential.

Availability of Ground Water in India

The total annual ground water recharge has been assessed as 437.60 billion cubic metres (bcm). Keeping an allocation for natural discharge, the annual extractable ground water resource works out as 398.08 bcm.

inFocus

- World's Largest Grain Storage Plan in Cooperative Sector
- Global Gender Gap Report 2023
- Fostering Effective Energy Transition 2023 Report
- Bonn Climate Change Conference
- Nano Fertilizers: Revolutionizing Indian Agriculture

World's Largest Grain Storage Plan in Cooperative Sector

Recently, the Union Cabinet approved the constitution and empowerment of an Inter- Ministerial Committee (IMC) for facilitation of the world's largest grain storage plan in cooperative sector with a convergence of various schemes from different ministries.

Objectives

- The plan focuses on strengthening food security, reducing wastage, and empowering farmers by creating godowns and agricultural infrastructure at the Primary Agricultural Credit Societies (PACS) level.

Need

Insufficient Storage Facilities

- At present, India has a foodgrain storage capacity of 145 million metric tonnes (MMT) against the total food production of 311 MMT, leaving a gap of 166 MMT.
- In the absence of sufficient storage facilities, foodgrains are sometimes stored in the open, which results in damage.
- At the regional level, only a few southern states have the storage capacity of 90 per cent and above.
- In northern states like Uttar Pradesh and Bihar, it is below 50 per cent.

Ensuring Food Security

- India, the most populous country in the world, accounts for 18 per cent (1.4 billion) of the global population (7.9 billion).
- However, it accounts for only 11 per cent (160 million hectare) of the arable land (1,380 million hectare) in the world.
- Also, India runs the world's largest food programme under the National Food Security Act, 2013, that covers about 81 crore people.
- Therefore, to ensure food security of a billion plus population, a robust network of foodgrain storage facilities becomes essential.

About Grain Storage Plan

Implementation

- To ensure efficient and timely implementation of the plan, the Ministry of Cooperation will carry out a pilot project in at least 10 selected districts across different states and union territories.

Creation of Infrastructure

- The Inter-Ministerial Committee, chaired by the Minister of Cooperation will modify guidelines and implementation methodologies of the respective ministries.
- Their goal is to facilitate the creation of infrastructure, such as warehouses, at viable Primary Agricultural Credit Societies (PACS) for agricultural and allied purposes.
- Under this plan, every block will have a godown with a capacity of 2,000 tonnes.

Schemes Identified for Convergence under the Plan

Following schemes have been identified for convergence under the plan:

1. **Ministry of Agriculture and Farmers Welfare**
   - Agriculture Infrastructure Fund (AIF),
   - Agricultural Marketing Infrastructure Scheme (AMI),
   - Mission for Integrated Development of Horticulture (MIDH),
   - Sub Mission on Agricultural Mechanization (SMAM).
2. **Ministry of Food Processing Industries**
   - Pradhan Mantri Formalization of Micro Food Processing Enterprises Scheme (PMFME),
   - Pradhan Mantri Kisan Sampada Yojana (PMKSY).
3. **Ministry of Consumer Affairs, Food and Public Distribution**
   - Allocation of food grains under the National Food Security Act,
   - Procurement operations at Minimum Support Price

Polity & Governance

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- Renouncement of Indian Citizenship
- National Company Law Appellate Tribunal
- Commission of Railway Safety
- First-ever National Training Conclave

Judiciary

- Right to Change Name

Plans /Policies

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- BIS License Mandatory for 24 Footwear Products
- 17th Indian Cooperative Congress

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- National Institutional Ranking Framework

News Snippets

Polity & Governance

Governor's Power to Dismiss the Ministers

On 29th June, 2023, Tamil Nadu Governor dismissed a Minister from the cabinet, who had been arrested, but later suspended the order following a request from Union Home Ministry.

- The unprecedented, and more importantly, unilateral decision by a governor to sack a minister appointed on aid and advice of the chief minister, has raised questions on the legality of such a move by the figurative head of a state, nominated by the Union government.

Does a Governor have the Power to Remove a Minister?

- Article 164(1) says state "Ministers shall hold office during the pleasure of the Governor".
- However, as per the constitutional experts the Governor cannot remove a minister in their own capacity without obtaining the sanction of the Chief Minister or consulting with the latter.
- If a Governor removes a minister in their own capacity, that will result in 'parallel governance'.
- Only when the Chief Minister allows it, then the Governor is empowered to remove the minister.

Supreme Court on Powers and Role of Governor

State of Punjab vs. Principal Secretary to the Governor (2023)

- In this case the Supreme Court (SC) underlined the role of a governor and a Chief Minister in the functioning of a parliamentary democracy.
- Political differences in a democratic polity have to be worked upon and sorted out with a sense of sobriety and maturity.
- The dialogue between constitutional functionaries cannot degenerate into a race to the bottom.

AG Perarivalan vs. State, Through Superintendent of Police CBI/SIT/MMDA, Chennai, Tamil Nadu and Anr (2022)

- Here the SC maintained that the Governor is the constitutional or formal head of the state.
- He exercised all his powers and functions conferred on him by or under the Constitution on the aid and advice of his council of ministers except in spheres where the Governor is required by or under the Constitution to exercise his functions at his discretion.
- The Court cited promulgation of ordinance, suspension of a member of a public service commission and proclamation of emergency as some of the examples where governor needs to act in his discretion or to the satisfaction of the President.

Nabam Rebia and Etc. vs. Deputy Speaker and Ors (2016)

- The Supreme Court cited the observations of B R Ambedkar –"The Governor under the Constitution has no function which he can discharge by himself; no functions at all. While he has no functions, he has certain duties to perform, and I think the House will do well to bear in mind this distinction."
- The Supreme Court ruled that Article 163 of the Constitution does not give the Governor a general discretionary power to act against or without the advice of his Council of Ministers.

Recommendations of various Commissions on Governor's Office

Punchhi Commission (2010)

- It suggested that the phrase "during the pleasure of the President" should be deleted from the Constitution, because a Governor should not be removed at the will of the central government; instead he or she should be removed only by a resolution of the state legislature.
- It proposed that a committee comprising the Prime Minister, Home Minister, Vice President, Speaker, and the concerned Chief Minister should choose the Governor.

Venkatachaliah Commission (2002)

- Governors should be allowed to complete their five year term.

Social Justice
- UNDP and DAY-NULM for Women Entrepreneurs
- Meira Paibis

Social Issues
- Horizontal Reservation for Transgender Community

Plans/Policies
- Special Scheme to Support Minor Rape Victims
- National Sickle Cell Anaemia Elimination Mission
- Pradhan Mantri Matru Vandana Yojana
- Skill Impact Bond

Report/Survey
- WHO Report on 'Har Ghar Jal' Program

Summit /Seminar
- Women 20 Summit 2023

News Snippets

Social Justice

UNDP and DAY-NULM for Women Entrepreneurs

On 21st June, 2023, the United Nations Development Programme (UNDP) and the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM) entered into a collaborative partnership aimed at empowering women to make well-informed career choices in the field of entrepreneurship.

Major Highlights of Partnership

- **Empowering Women in Entrepreneurship:** The partnership aims to empower women by providing support for starting or expanding their own enterprises.
- **Inclusive Entrepreneurship Ecosystem:** The partnership aims to create an inclusive entrepreneurship ecosystem that enables women to make well-informed career choices in the field of entrepreneurship. It seeks to address gender disparities in entrepreneurship and promote economic growth.
- **National-Level Capacity Building:** UNDP, with its experience in linking over 200,000 women to better employment opportunities, will provide national-level capacity building support to DAY-NULM.This support includes knowledge generation and management, compiling best practices related to urban poverty, and enhancing the implementation of national-level schemes.
- **Innovative Solutions in the Care Economy:** The partnership will collaborate on piloting innovative solutions, with a particular focus on the care economy domain.
- **On-Ground Mobilization Activities:** The partnership will engage in on-ground mobilization activities to identify areas of urban poverty and potential women entrepreneurs.
- **Biz-Sakhis:** UNDP will contribute by developing community business mentors called Biz-Sakhis in selected project locations.

Expected Impact

- **Empowering Women**: The partnership holds great promise for empowering women in entrepreneurship, unleashing their potential for economic growth, and creating a more inclusive and prosperous society.
- **Sustainable Change**: By offering comprehensive support, fostering innovation, and promoting knowledge sharing, this collaboration will help to drive sustainable change and uplift urban women toward a brighter future.

Important Facts

Deendayal Antyodaya Yojana-National Rural Livelihood Mission (DAY-NRLM)

- DAY-NRLM is a flagship poverty alleviation program implemented by the Ministry of Rural Development, Government of India.
- It aims to reduce poverty by enabling the poor household to access gainful self-employment and skilled wage employment opportunities resulting in sustainable and diversified livelihood options for the poor.
- This is one of the world's largest initiatives to improve the livelihoods of the poor.
- The Mission seeks to achieve its objective through investing in four core components viz., (a) social mobilization and promotion and strengthening of self-managed and financially sustainable community institutions of the rural poor women; (b) financial inclusion; (c) sustainable livelihoods; and (d) social inclusion, social development and access to entitlements through convergence.

Meira Paibis

On 24th June, 2023, the Indian Army's Spear Corps accused women activist Meira Paibis in Manipur of obstructing routes and interfering in security operations amid ongoing rioting and unrest in the state.

History

- Ten Principal Upanishads

Art & Culture

- GI Tag to Products in Uttar Pradesh
- Bagh Print
- Kharchi Puja
- Raja Parba
- Palkhi Festival
- Yakshagana
- Nehru Memorial Museum and Library

Personality

- Rani Durgavati

Miscellaneous

- Natural Arch

News Snippets

History

Ten Principal Upanishads

Indian prime minister gifted US president the first edition print of the book "The Ten Principal Upanishads" (1937) during his visit to the White House.

About Ten Principal Upanishads

- The Ten Principal Upanishads, translated from Sanskrit by Shri Purohit Swami, a scholar of Hindu scripture, and Irish poet WB Yeats, is considered to be one of the best translations of the Upanishads, some of the most important Hindu religious texts.
- Written in the mid-1930s, the book was a product of Yeats' desire to create a translation which is true to the original text while still being accessible for the layperson.

Categories of Hindu Scriptures

- There are broadly two categories of Hindu sacred texts: shruti (loosely translated as "the revealed") and smriti ("the remembered").
- The first category is considered to be the most authoritative and consists of the four Vedas (Rig, Yajur, Sama and Atharva) and accompanying texts.
- These include Brahmanas (ritual texts), Aranyakas ("forest" or "wilderness" texts), and Upanishads (philosophical texts).
- The second category of Hindu scriptures is less authoritative – in many ways they are considered to be derived from the first. These include the great epics of Ramayana and Mahabharata, Dharmashastras, Puranas and all other post-Vedic scriptures.

About Upanishads

- The Upanishads, also known as the Vedanta – as they signal the end of the total Veda – speculate about the ontological connection between humanity and the cosmos.
- They serve as foundational texts in many traditions of Hindu theology and have hence attracted far more attention than the Vedas themselves.
- Dated to roughly 800-500 BC, the Upanishads discuss concepts such as transmigration, which have today become central to Hindu tradition.
- The Upanishads were given particular importance in Hindu theology by eighth century scholar Adi Shankara, whose interpretations synthesised the Advaita Vedanta tradition.
- Much of the Upanishads are concerned with the relationship between the atman, or the distinct, unchanging self of an individual, and the brahman, the ultimate reality in the universe.
- **Ten Principal Upanishads:** Esha, Kena, Katha, Prashna, Mundaka, Manduky , Taittiriya, Aitareya, Chandogy, Brihadaranyaka.

Significance of Upanishads

- Upanishads present a vision of an interconnected universe with a single, unifying principle behind the apparent diversity in the cosmos, any articulation of which is called brahman.

Important Facts

The Vedas

- The Vedas are known as 'Shruti' meaning 'through hearing', as they were handed down through generations orally with the help of elaborate mnemonic techniques.
- **There are four Vedas:** Rigveda, Yajurveda, Samaveda, Atharvaveda

Each Veda has Four Subdivisions:

(i) The Samhitas (mantras and benedictions)
(ii) The Aranyakas (text on rituals, ceremonies, sacrifices, and symbolic sacrifices)
(iii) The Brahmanas (commentaries on rituals, ceremonies, and sacrifices)
(iv) The Upanishads (texts discussing meditation, philosophy, and spiritual knowledge).

Agriculture
- Open Market Sale Scheme
- Government imposes Ceiling on Wheat Stocks

Plans/Policies
- PM-PRANAM Scheme
- Exploration of Coal and Lignite Scheme

Banking & Finance
- Multi-cap Mutual Fund
- Public Issue of Shares
- Credit Information Companies (Regulation) Act, 2005
- First Loss Default Guarantee
- Compromise Settlement
- Trade Receivables Discounting System
- Sovereign Gold Bond Scheme 2023-24 (Series I)

Infrastructure
- Gas-based Economy
- SAGAR SAMRIDDHI

Industry
- India: 2nd Largest Producer of Crude Steel in the World

Agriculture

Open Market Sale Scheme

On 13th June, 2023, the Centre discontinued the sale of rice and wheat from the central pool under the Open Market Sale Scheme (OMSS) to state governments.

- However, the sale of rice under the OMSS will be continued for northeastern states, hilly states and states facing law and order situations, natural calamities at an existing rate of Rs 3,400 per quintal.

Reasons for Discontinuation

- ✓ To control price inflation
- ✓ To ensure price stability
- ✓ To balance stock levels
- ✓ To streamline distribution channels
- ✓ To promote market competition

About Open Market Sale Scheme (OMSS)

- Under OMSS, the Food Corporation of India (FCI) sells surplus stocks of wheat and rice at pre-determined prices through e-auction in the open market.
- **Objective:** To enhance the supply of food grains, especially wheat, during the lean season and thereby moderate the open market prices, specially in the deficit regions.
- The FCI conducts a weekly auction to conduct this scheme in the open market using the platform of commodity exchange National Commodity and Derivatives Exchange Limited (NCDEX).
- The State Governments/ Union Territory Administrations are also allowed to participate in the e-auction, if they require wheat and rice outside the Targeted Public Distribution Scheme (TPDS) and Other Welfare Schemes (OWS).
- The reserve price is fixed by the government. In the tenders floated by the FCI, the bidders cannot quote less than the reserve price.

Components

- Sale of wheat to bulk consumers/private traders through e-auction.
- Sale of wheat to bulk consumers/private traders through e-auction by dedicated movement.
- Sale of Raw Rice Grade 'A' to bulk consumers/private traders through e-auction.

Important Facts

Targeted Public Distribution System

- In June, 1997, the Central Government launched the Targeted Public Distribution System (TPDS) with a focus on the poor.
- Under TPDS, beneficiaries were divided into two categories: Households below the poverty line BPL; and Households above the poverty line (APL).
- The bifurcation of BPL and APL quotas of foodgrains into rice and wheat has been left to the States.

Government imposes Ceiling on Wheat Stocks

On 12th June, 2023, the Union Government imposed limits on stock of wheat that can be held by traders, wholesalers, retailers, big chain retailers, and processors.

- The order stood effective with immediate effect until the end of March next year.

Objective

- To stabilise the price of the essential commodity.
- To manage the overall food security and to prevent hoarding and unscrupulous speculation.

Current Permissible Stock Limits

- The permissible stock that traders/wholesalers can hold is 3,000 metric tonnes.

Space Science

- New Study on Pulsars
- Solar Ultraviolet Imaging Telescope

New Technology & Innovations

- Electrolyzing Seawater for Hydrogen Generation
- New Technology for Textile Wastewater Treatment
- AI-Driven Discovery of Abaucin
- High Frequency Radio Communications
- X-ray of a Single Atom

Government Policies/Initiatives

- Mission on Advanced and High-Impact Research
- Unnat Takniki Pradarshan Kendra

News Snippets

Space Science

New Study on Pulsars

Recently, an international team of astronomers, including researchers from India, Japan, and Europe, conducted a groundbreaking study utilizing the Pune-based upgraded Giant Metrewave Radio Telescope (uGMRT) and five other large telescopes.

- The study focused on pulsar observations and their implications for gravitational waves, providing key findings that advance the understanding of these cosmic phenomena.

Key Points

- **Importance of uGMRT and Indian Telescope Data:** The data from India's largest telescope, the Pune-based uGMRT, marked the first time that an Indian telescope's data was used for hunting gravitational waves.
- **Confirmation of Gravitational Waves:** The study provided compelling evidence confirming the existence of gravitational waves through the observation of pulsars.
- Gravitational waves, which are ripples in the fabric of space-time, were detected and their influence on pulsar signals was observed.
- **Time Aberrations in Pulsar Signals**: The researchers observed time aberrations in the signals emitted by pulsars. These time aberrations were caused by the gravitational waves affecting the arrival times of the pulsar signals.
- The precise timing of these signals allowed for the detection of these minute changes.
- **Presence of Nano-Hertz Signals:** The study detected nano-hertz signals, referred to as the "humming" of the Universe, caused by the interaction between gravitational waves and the irregularities in pulsar signals.
- These signals arrived either slightly early or with a slight delay, on the order of less than a millionth of a second.

Significance

- **Opening a New Window in Gravitational Wave Astronomy**: The findings represent a significant milestone in gravitational wave astronomy, as they provide a new perspective and understanding of these phenomena.
- This research opens up exciting avenues for further exploration and study of the astrophysical aspects related to gravitational waves.

Solar Ultraviolet Imaging Telescope

Recently, the Solar Ultraviolet Imaging Telescope (SUIT), developed by Pune's Inter-University Centre for Astronomy and Astrophysics (IUCAA), has been delivered to the Indian Space Research Organisation (ISRO) for integration with the Aditya-L1 Mission.

SUIT: Key Points

- **Aim:** One of the seven payloads of Aditya-L1 Mission, SUIT aims to study the Sun's ultraviolet (UV) emissions and capture high-resolution images of the Sun's atmosphere, known as the corona, in various UV wavelengths.
- **Mapping:** SUIT will map the photosphere and the chromosphere of the Sun using 11 filters sensitive to different wavelengths and covering different heights in the solar atmosphere and help understand the processes involved in the transfer of mass and energy from one layer to the other.
- **Measuring Solar Spectral Irradiance**: SUIT will allow measuring and monitoring spatially resolved solar spectral irradiance that governs the chemistry of oxygen and ozone in the stratosphere.

Important Facts

Aditya-L1 Mission

- **About:** Aditya-L1 shall be the first space based Indian mission to study the Sun. The mission will fly approximately 1.5 million kilometers from Earth to the Lagrange point 1 (L1), one of the five favorable spots for observing the Sun.

Climate Change

- Melting of Glaciers in Hindu Kush Himalayas

Biodiversity

- UN High Seas Treaty
- National Working Plan Code-2023

Government Policies/Initiatives

- Draft Green Credit Programme Implementation Rules 2023
- National Energy Data: Survey and Analysis 2021-22 Report

Sustainable Development

- GoI-UN Sustainable Development Cooperation Framework
- New Global Financing Pact Summit

News Snippets

Climate Change

Melting of Glaciers in Hindu Kush Himalayas

Recently, the Kathmandu-based International Centre for Integrated Mountain Development (ICIMOD) released a report highlighting the alarming loss of glacier mass in the Hindu Kush Himalaya (HKH) region.

Key Findings

- **Loss of Glaciers:** The glaciers lost a mass of 0.28 metres of water equivalent per year (m w.e.) between 2010 and 2019 compared to 0.17 (m w.e.) per year between 2000 and 2009.
- **Freshwater Availability:** The rivers originating from the Hindu Kush Himalayas supply water to nearly 2 billion people living downstream. The melting of glaciers and reduced snow cover due to global warming will lead to a decrease in freshwater availability for these communities.
- This will affect agriculture, which relies on these rivers for irrigation and sediment deposition to fertilize soils in valleys and floodplains.
- **Increased Risks:** The report highlights that the Himalayan region will experience an increased likelihood of flash floods and avalanches in the coming years.
- The melting glaciers can also create natural dams that, when breached, can result in destructive floods downstream.
- The predicted increase in extreme rainfall events further exacerbates the risks faced by communities in the region.
- **Glacial Lake Outburst Floods:** The Hindu Kush Himalaya region has around 200 glacier lakes that are considered dangerous.
- These lakes pose a risk of glacial lake outburst floods, which can have cascading effects on agriculture, food security, freshwater availability, energy sources, and biodiversity. It also puts certain plant and animal species at the risk of extinction.
- **Unprecedented and Irreversible Changes:** The report emphasizes that the changes occurring in the glaciers, snow, and permafrost of the Hindu Kush Himalaya region due to global warming are unprecedented and largely irreversible. This means that the impact of climate change on the region's ecosystems and communities is severe and long-lasting.

Significance

- **Vulnerability:** The report emphasizes the vulnerability of mountain communities who bear the brunt of climate change impacts despite having minimal contributions to global warming.
- **Need for Immediate Action**: Immediate action and greater support are crucial to address the challenges faced by these communities and to develop effective adaptation strategies.
- The report underscores the urgent need to prioritize the preservation of the HKH region's glaciers and the sustainable management of its water resources.
- **Collaborative Mitigation Efforts:** The report highlights the importance of collaborative mitigation efforts to mitigate the devastating consequences and protect the livelihoods of millions of people who rely on these mountain ecosystems.

Important Facts

International Centre for Integrated Mountain Development (ICIMOD)

- ICIMOD is an intergovernmental knowledge and learning centre working on behalf of the people of the Hindu Kush Himalaya (HKH).
- It is based in Kathmandu, Nepal, and works in and for its eight regional member countries – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.

International Relations

- First Round Table Joint Meeting between India and New Zealand
- 5th India-Philippines Joint Commission on Bilateral Cooperation
- 2nd Meeting of India-Tanzania Joint Defence Cooperation Committee
- India-U.S. Defence Acceleration Ecosystem
- India-US Deals
- Strategic Partnership Agreement between India and Egypt
- 23rd Shanghai Cooperation Organisation Summit
- WTO Trade Disputes between India and US

Report

- India-Africa Partnership: Achievements, Challenges and Roadmap 2030

International Relations

First Round Table Joint Meeting between India and New Zealand

On 8th June, 2023, the first Round Table Joint Meeting between India and New Zealand was held in New Delhi.

Major Highlights

- **Bilateral Trade Potential:** Both sides acknowledged the significant potential in the partnership between India and New Zealand and expressed the need to enhance economic relations in areas of mutual interest.
- **Synergy and Cooperation**: The meeting emphasized the importance of bringing synergy between the two countries beyond a free trade agreement.
- Exploring areas where India and New Zealand can complement each other was considered crucial for enhanced economic cooperation.
- **Joint Trade Committee (JTC):** The participants focused on advancing the objectives of the Joint Trade Committee formed under the Bilateral Trade Agreement of 1986. Strengthening the existing institutional mechanism and creating a structure for cooperation and collaboration issues were emphasized.
- **Areas of Cooperation**: Various areas of cooperation were explored during the meeting, including the promotion of the Unified Payment Interface (UPI) system, carbon credit cooperation, economic collaboration through sectoral arrangements, and addressing specific issues like the comprehensive proposal.
- **Air Connectivity:** The need to increase air connectivity links between India and New Zealand was highlighted as a means to facilitate trade and enhance economic cooperation.
- **Government-to-Industry Dialogues**: Both sides agreed on the necessity of more government-to-industry dialogues to achieve concrete mutual benefits. Engaging with industry representatives and addressing bilateral trade issues were seen as crucial steps in this process.
- **Industry Interventions**: Representatives from various sectors such as IT/ITeS, logistics, banking, food processing, pharmaceuticals, automobile, construction, and power made valuable interventions during the meeting, highlighting the potential and opportunities for cooperation between the two economies.
- **Structured Dialogue:** The industry and industry associations from New Zealand emphasized the need to speed up activities and continue the dialogue in a more structured manner to further enhance the economic relationship between the two countries.

Significance

- The meeting acknowledged the vast potential in the partnership between India and New Zealand and emphasized the need to bring synergy to enhance economic relations.
- By identifying areas of mutual interest and exploring avenues beyond a free trade agreement, both countries aim to strengthen their economic ties.

5th India-Philippines Joint Commission on Bilateral Cooperation

On 29th June, 2023, External Affairs Minister of India and Secretary for Foreign Affairs of the Philippines co-chaired the 5th meeting of the Joint Commission on Bilateral Cooperation (JCBC).

Key Highlights

- **Recognition of the 2016 Arbitral Award:** The leaders referenced the 2016 Arbitral Award on the South China Sea, which ruled in favor of the Philippines and rejected China's claims and actions in the region.
- They reiterated the importance of respecting the award and recognizing its validity as a basis for resolving disputes.
- **Peaceful Settlement of Disputes**: The leaders emphasized the importance of resolving disputes in the South China Sea through peaceful means.
- They highlighted the need to avoid conflicts and promote dialogue for a peaceful resolution.

General Studies Paper I-IV

100 Mains Topics with Questions & Answers

A careful analysis of previous three years Civil Services Main Examination General Studies question papers reveals that the questions are issue-based, open-ended, multidisciplinary and interdisciplinary in nature. The questions demand analytical and critical answers.

Accordingly, in this special section, we have come up with curated content on a select list of 100 topics for the upcoming Mains examination along with questions & answers.

- *The topics included herein have been prepared keeping in mind those aspects from which questions are expected in the Mains examination.*
- *The topics comprise those issues which have multiple facets to them and many types of questions could be asked from them.*
- *The issues covered under questions and answers are those from which direct questions could be asked.*
- *The answers to the questions represent the ideal answer writing technique.*

Based on this theme, we will continue to publish Mains exclusive content on all expected topics in the forthcoming issues.

We hope you find this material helpful in your preparation for the Civil Services Main Examination. We encourage you to send us your feedback at cscenglish@chronicleindia.in

Happy reading!

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Indian History & Culture

Traditional Medicine

Significance

- **Less Capital Intensive:** Traditional and complementary remedies require only a small amount of technical input. As a result, they are affordable to the poor, and they have the potential to help many developing countries like India to improve their health-care systems.
- **Improving access to Public Health Facilities:** Despite the fact that 71 per cent of the population is rural, only 34 per cent of allopathic doctor practise in rural areas. The proportion of Ayush doctors in some of the country's poorest areas is significant. As a result, health facilities in remote places may be more accessible.
- **Improved Illness Management:** The most important step in disease management is prevention. It lessens the pressure on public secondary and tertiary health-care facilities. AYUSH medicines play vital role in preventive care. Also, AYUSH doctors could be roped in for providing services that does not need specialization in allopathy.
- **Improving Doctor to Patient Ratio:** In India, the ratio of the doctor-patient is 1:1456 - if we consider only allopathic doctors; the ratio will come to 1:800 if the AYUSH practitioners are added. This is much better than the WHO recommendation of 1:1000. Thus, leveraging AYUSH doctors is vital for achieving universal health care services.
- **Effective in managing Chronic Diseases:** Scientific studies of several Traditional Medicine (TM) and Complementary and Alternative Medicine (CAM) therapies show that their use is effective, e.g., for HIV/AIDS and cancer patients.

Concerns

- **Marginalization of Traditional and Complementary Medicines:** The National Health Policy (NHP) of 1983 stated that deliberate efforts should be made to integrate practitioners' functions and services across various medical systems in the overall health-care delivery system. Until recently, however, the AYUSH and allopathy health care systems remained as separate watertight compartments, with allopathy receiving disproportionately more weight.
- **Inequitable Funding:** The Ministry of Health and Family Welfare (MoHFW) received 86,200.65 crore in Budget 2020-21, whereas the Ministry of AYUSH received only Rs. 3,050 crore. In terms of research, education, and training, such unbalanced funding will inevitably create a divide between AYUSH and Allopathy.
- **Low acceptance of AYUSH:** National Sample Survey in 2014 indicated that only 6.9% of patients seeking outpatient care opted for AYUSH. In the case of hospitalised care, the proportion is less than 1%.
- **State Subject:** Health being a state subject adds an extra layer of complexity to any national level initiative. There are states like Maharashtra that have adopted a realistic approach where AYUSH doctors are allowed to practice Allopathy and prescribe drugs, after completing a one-year course. However, such vital steps are missing in other states.

Traditional Indian Textiles

Significance

- **Best in the World:** India produces finest traditional textiles in the world with respect to dyeing, weaving and surface embellishment.
- **Historical Significance:** The richness of India's traditional textile crafts is evident in the excavated findings of Harappa and Mohenjo-Daro in the Indus Valley, which dates back to 5000 years.
- **Hand Woven:** Indian traditional textile is hand woven and thus, each garment is enriched by nuances of native weavers and offers wide range of design.

Challenges

- **Shortage in Supply of Raw Material:** The closing of several factories in China and Europe over environmental concerns has caused an unprecedented increase in the cost of fundamental raw materials on global markets.
- **Rise in Raw Material Prices:** After numerous Chinese facilities were shut down for violating pollution standards, prices have gone up. The cost of dyes has gone up due to the increase in the price of imported raw materials.
- **Need to adhere to strict Social and Environmental Standards:** Environmental compliance isn't always the primary priority for importers of textiles and apparel. As demand grows for the apparel industry to strengthen environmental compliance efforts, failure to comply with environmental rules might jeopardise the supply chain.
- **Infrastructure Bottlenecks:** India's poor infrastructure continues to be inferior to that of several other Asian nations.
- **Inequality in Regional Development:** The textile industry of the nation is concentrated in a few isolated areas in Tamil Nadu and Karnataka in the south and Gujarat and Maharashtra in the west. These units hire a sizable amount of their workforce from West Bengal, Bihar, and Uttar Pradesh.