



TATHASTU ICS



SEPTEMBER 8, 2023

S.No	TOPICS
1.	BATTERY ENERGY STORAGE SYSTEM
2.	CDSO ISSUES ALERT AFTER PHARMA COMPANIES RECALL ANTACID SYRUP
3.	LORD OF DANCE: HISTORY AND SYMBOLISM OF SHIV'S NATARAJA FORM

BATTERY ENERGY STORAGE SYSTEM

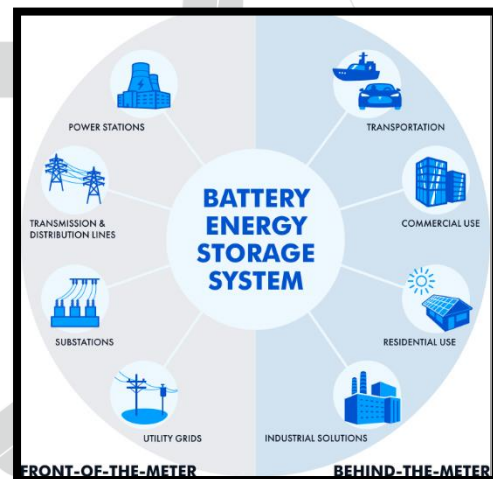
SOURCE: [THE HINDU](#)

WHY IN NEWS?

- The establishment of a **4,000 MWh battery energy storage system (BESS)** in India has received approval from the Indian government for **viability gap funding (VGF)**, which will cover up to 40% of the total capital cost.
- This program is in line with **India's ambitions for renewable energy** since the nation has experienced a tremendous increase in **solar and wind energy capacity** and now sources 25% of its energy needs from renewable sources, including big hydroelectric projects.

ABOUT BATTERY ENERGY STORAGE SYSTEMS:

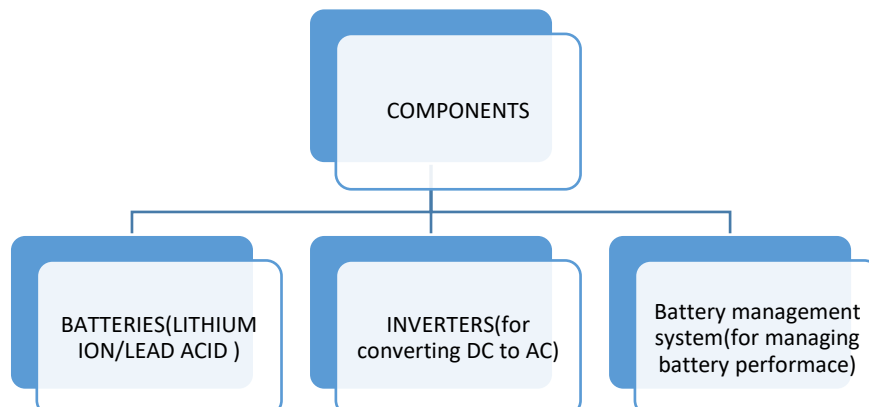
- A technique known as a **Battery Energy Storage System (BESS)** is in use to **store electric charge** using specially designed batteries.
- The basic concept is that such **stored energy may be used in the future.**
- The concept of a battery energy storage system has become a **commercial reality** because of the enormous amount of research that has produced battery advancements.
- **Energy Storage Systems (ESSs)** are a group



that includes Battery Energy Storage Systems (BESSs).

Figure 1 APPLICATIONS OF BATTERY ENERGY STORAGE SYSTEMS

COMPONENTS OF BATTERY ENERGY STORAGE SYSTEM:



BENEFITS OF BATTERY ENERGY STORAGE SYSTEM:

INDUSTRIAL APPLICATIONS

- UNINTERRUPTED ENERGY FOR MANUFACTURING
- MICRO GRID INTEGRATION
- GRID SERVICES AND REVENUE GENERATION

RESIDENTIAL USE

- EV CHARGING INFRASTRUCTURE
- OFF GRID LIVING (ENERGY INDEPENDENCE)
- CHEAPER ENERGY

GOVERNMENT TARGETS

- RENEWABLE ENERGY TARGETS
- CLIMATE CHANGE MITIGATIONS

CHALLENGES ASSOCIATED WITH BATTERY ENERGY STORAGE SYSTEMS:

- **RAW MATERIAL PROCUREMENT:** It can be **expensive to use battery technology**, especially cutting-edge lithium-ion batteries.
 - For residential, commercial, and industrial users, the initial expense of buying and installing a BESS might be a major obstacle.
- **GRID INTEGRATION:** **Voltage fluctuations and frequent blackouts** are among the reliability problems the Indian power infrastructure faces.
- **SAFETY CONCERNS:** The most popular battery type used in BESS, **lithium-ion**, can provide safety issues if not created, manufactured, and maintained correctly.
 - Batteries that have been damaged or put through extreme conditions run the risk of experiencing problems including **thermal runaways, fires, and explosions**.
- **LIMITED ENERGY DENSITY:** Compared to other energy storage methods, such as the use of fossil fuels, batteries have a **lower energy density**.
 - This indicates that they might **not be able to provide long-term energy storage** or backup power without regular recharging or replacement.
- **TECHNICAL CHALLENGES:** BESS needs **highly developed battery management systems** to watch over and manage operations.
 - It may be technically difficult to integrate BESS into current energy systems, such as grids or renewable energy installations, due to **issues with interoperability, grid synchronization, and control algorithms**.

GOVERNMENT INITIATIVES FOR BATTERY ENERGY STORAGE SYSTEM

INITIATIVE	OBJECTIVE
1. NATIONAL ENERGY STORAGE MISSION	Focuses on the technology development of energy storage systems.

2. FASTER ADOPTION AND MANUFACTURING OF ELECTRIC VEHICLES(FAME)	Development of charging infrastructure.
3. GREEN ENERGY CORRIDOR	Development of the grid infrastructure
4. PRODUCTION-LINKED INCENTIVE FOR MANUFACTURING ADVANCED CHEMISTRY CELL BATTERY	For battery manufacturing in India.
5. VIABILITY GAP FUNDING	To ensure adequate funding for the development of battery energy storage systems.

WAY FORWARD:

- **ADVANCED BATTERY TECHNOLOGIES:** Invest in R&D to create cutting-edge battery technologies that are affordable, efficient, and appropriate for Indian conditions.
- **CERTIFICATION:** To guarantee safety, quality, and interoperability for BESS, develop and apply industry standards and certification procedures.
- **ANCILLARY SERVICES:** Recognise the importance of BESS in delivering ancillary services including grid stability, frequency regulation, and voltage support.
- **POLICY SUPPORT:** Create and implement regulations and policies that will aid in the implementation of BESS. This covers specific requirements for grid codes, compensation mechanisms, and interconnection.
- **FINANCING:** Establish mechanisms, such as low-interest loans, green bonds, and public-private partnerships, to make it easier to finance BESS projects.

PRELIMS SPECIFIC:

VIABILITY GAP FUNDING:

- ❖ A grant for initiatives that are economically viable but not financially viable is known as viability gap funding.
- ❖ The program is envisioned as a planning scheme to be managed by the Ministry of Finance, and budgetary allocations are made on an annual basis.
- ❖ A grant of this kind under the VGF is given as a capital subsidy to entice private sector participants to take part in PPP projects that would not otherwise be commercially feasible.

RENEWABLE ENERGY TARGETS OF INDIA

India's Goals for Renewable Energy:

- ❖ A capacity of 175 GW for renewable energy by 2022
 - ❖ Solar energy target: 100 GW.
 - ❖ Wind power: 60 GW.
 - ❖ 10 GW of bioenergy capacity.
 - ❖ Small Hydro Power at 5 GW.
 - ❖ 500 GW of non-fossil fuel-based energy by 2030: Prime Minister Narendra Modi made this announcement at the COP26 summit.
 - ❖ India pledged in its Nationally Determined Contributions (NDCs) under the Paris Agreement to generate 50% of its electricity from non-fossil fuel sources by 2030.
- India's Place in the World:**
- ❖ the world's fourth-largest installed solar and wind power capacity.
 - ❖ the world's fourth-most alluring market for renewable energy.



CDSO ISSUES ALERT AFTER PHARMA COMPANIES RECALL ANTACID SYRUP

SOURCE: [THE HINDU](#)

WHY IN NEWS?

- Healthcare professionals, customers, patients, wholesalers, distributors, and regulatory agencies have been informed about the voluntary recall of Abbott India's well-known antacid syrup Digene Gel, produced at its Goa facility, by the Central Drugs Standard Control Organisation (CDSCO).

REASONS FOR INADEQUATE SAFETY STANDARDS OF DRUGS IN INDIA:

- **Outdated laws:** Drugs and Cosmetic Rules 1945, and the Drugs and Cosmetic Act 1940 are not updated according to the changing needs.
- **Weak regulatory framework:** Regulatory bodies haven't had the tools, power, or capability to manage the pharmaceutical industry as a whole.
- **Limited capacity:** In India, regulatory agencies frequently lack the resources and manpower needed to carry out extensive inspections and enforce adherence to safety regulations.
- **Pharmaceutical industry:** Despite being advantageous to the economy, the pharmaceutical industry's fast expansion in India has made regulatory control more difficult. It has been challenging to keep up with the industry's growth.
 - One of the biggest pharmaceutical firms in India, Ranbaxy Laboratories, had significant regulatory problems in the US. The business agreed to pay a sizable fine after entering a guilty plea to criminal charges for contaminated pharmaceuticals in 2013.
- **Unethical practices:** India has struggled with the production and distribution of subpar and counterfeit medicines, which pose significant safety risks. Regulating bodies have had difficulty identifying and solving these issues.
 - In India, there have been numerous instances of fake medications being sold. For instance, in 2008, fake anti-malarial medications were found in a number of states, including West Bengal and Gujarat.

CONSEQUENCES OF INADEQUATE REGULATIONS:

- **Adverse health effects:** Drugs that are subpar or fake could be let onto the market, endangering patients.
 - These medications might not meet the necessary requirements for quality, effectiveness, and safety, which could result in treatment failures, disease progression, and negative health impacts.
- **Spread of anti-microbial drug resistance:** Due to insufficient regulation, improper use of antibiotics and other antimicrobial medications might contribute to the emergence of bacteria that are resistant to antimicrobials.
- **Health expenses:** The entire cost of healthcare for patients and healthcare providers might rise as a result of poor quality or ineffective medications because they can lead to prolonged diseases and higher medical costs.
- **Unethical practices:** Clinical trials can be poorly regulated, which can result in unethical behaviour and jeopardize the validity of trial findings. This may impede the creation and endorsement of novel medications and treatments.
- **Effect on exports:** India's reputation as a leading pharmaceutical manufacturer may suffer due to quality and safety concerns with its products, which could have an impact on export markets.

LAWS AND REGULATIONS FOR DRUG CONTROL IN INDIA

Name of Law/Regulation	Objectives
Drugs and Cosmetics Act, 1940	<ol style="list-style-type: none"> 1. Regulate the import, manufacture, sale, and distribution of drugs and cosmetics. 2. Ensure the safety, quality, and efficacy of pharmaceutical products. 3. Prevent the sale and distribution of spurious, adulterated, and misbranded drugs.
Drugs and Cosmetics Rules, 1945	<ol style="list-style-type: none"> 1. Provide detailed guidelines and procedures for the implementation of the Drugs and Cosmetics Act. 2. Regulate licensing, inspections, quality control, clinical trials, and import/export of drugs.
New Drugs and Clinical Trials Rules, 2019	<ol style="list-style-type: none"> 1. Govern the conduct of clinical trials and the approval process for new drugs and investigational products. 2. Specify the responsibilities of investigators, ethics committees, and sponsors in clinical trials.
Pharmacy Act, 1948	<ol style="list-style-type: none"> 1. Regulate the education and practice of pharmacy in India. 2. Establish the Pharmacy Council of India (PCI).
Pharmacy Practice Regulations, 2015	<ol style="list-style-type: none"> 1. Set standards and guidelines for the practice of pharmacy in India. 2. Define the role of pharmacists in patient care and prescription handling.
National Pharmaceutical Pricing Authority (NPPA)	<ol style="list-style-type: none"> 1. Regulate the prices of essential medicines and bulk drugs. 2. Ensure the availability of essential medicines at affordable prices.
Patents Act, 1970	<ol style="list-style-type: none"> 1. Regulate patents and intellectual property rights in India, including those related to pharmaceuticals. 2. Balance innovation with access to medicines.
Ministry of Ayush	Promotion of traditional medicine

WAY FORWARD:

- **Effective regulation:** Make sure that all regulatory procedures, such as drug approval, inspection, and monitoring, are transparent. Publicize details about clinical trials, licenced medications, and inspections.

- **Quality control:** Provide regulatory organizations like the Central Drugs Standard Control Organisation (CDSCO) additional resources, manpower, and power so they can manage the pharmaceutical business more efficiently.
- **Improve drug testing facilities:** To assure a precise and rapid evaluation of drug quality, invest in sophisticated laboratories with cutting-edge testing apparatus.
- **Strict penalties:** Impose severe fines and legal repercussions on producers and sellers of subpar, fake, or illegal medications.

PRELIMS SPECIFIC:

HISTORY OF INDIAN MEDICINE:

- ❖ **RIGVEDIC PERIOD:** The ancient Vedic scriptures, especially the Atharvaveda, contain the earliest known medical expertise in India. These texts include rituals and songs that deal with herbs, plants, and healing.
- ❖ **AYURVEDA:** India is where Ayurveda, frequently regarded as the world's oldest medical system, emerged. It places a strong emphasis on natural remedies, food, yoga, and herbal treatments and is founded on the concepts of the equilibrium between the three doshas (Vata, Pitta, and Kapha).
The Charaka Samhita and Sushruta Samhita, two traditional Ayurvedic classics, offer thorough advice on health and medicine.
- ❖ **SIDDHA MEDICINE:** An old form of medicine called siddha medicine has its roots in South India. It combines herbal treatments, minerals, and yoga to promote healing and is founded on the idea of the five elements and the three humours (Vata, Pitta, and Kapha).
- ❖ **YOGA:** Yoga has medicinal uses in Indian medicine, while being largely a spiritual and intellectual practise.
- ❖ **UNANI MEDICINE:** Persian and Arab scholars brought unani medicine, also known as yunani or greco-arabic medicine, to India. It is based on Hippocrates' and Galen's ideas and includes aspects of Ayurveda.



LORD OF DANCE: HISTORY AND SYMBOLISM OF SHIV'S NATARAJA FORM

SOURCE: [THE INDIAN EXPRESS](#)

WHY IN NEWS?

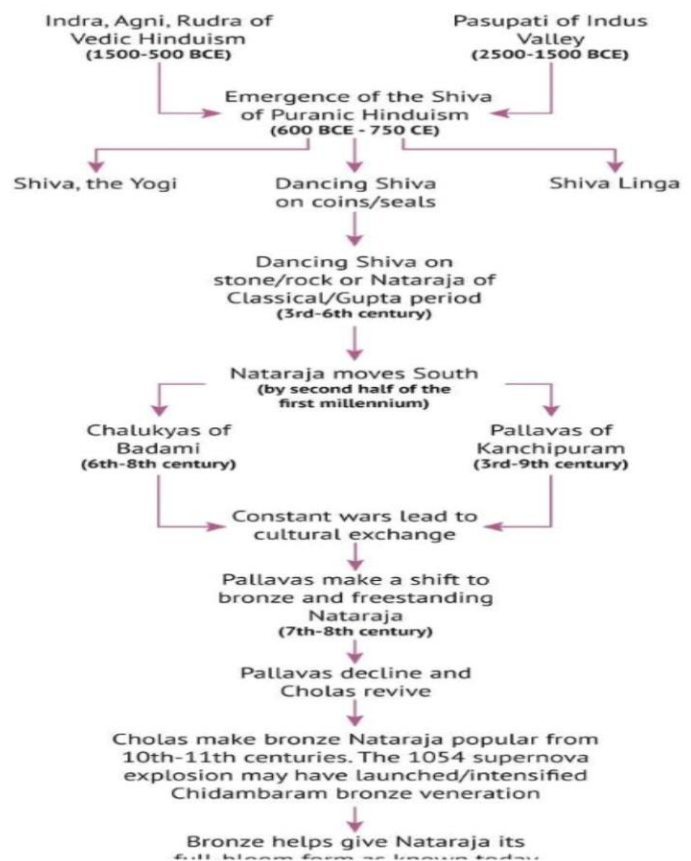
- This weekend, a majestic 27-foot Nataraja, the tallest statue of Lord Shiva's dancing form in the world, will welcome G20 leaders in front of Bharat Mandapam in New Delhi's Pragati Maidan.
- The statue was created by sculptors from Swamimalai in the Thanjavur region of Tamil Nadu as an ashtadhatu (eight-metal alloy) work of art. It was transported across the nation on a 36-wheel trailer and weighed around 18 tonnes.
- **Design Inspiration:** The sculpture draws inspiration from three revered Nataraja idols at the Thillai Nataraja Temple in Chidambaram, the Uma Maheswarar Temple in Konerirajapuram, and the Brihadeeswara Temple in Thanjavur.



HISTORY OF NATARAJA

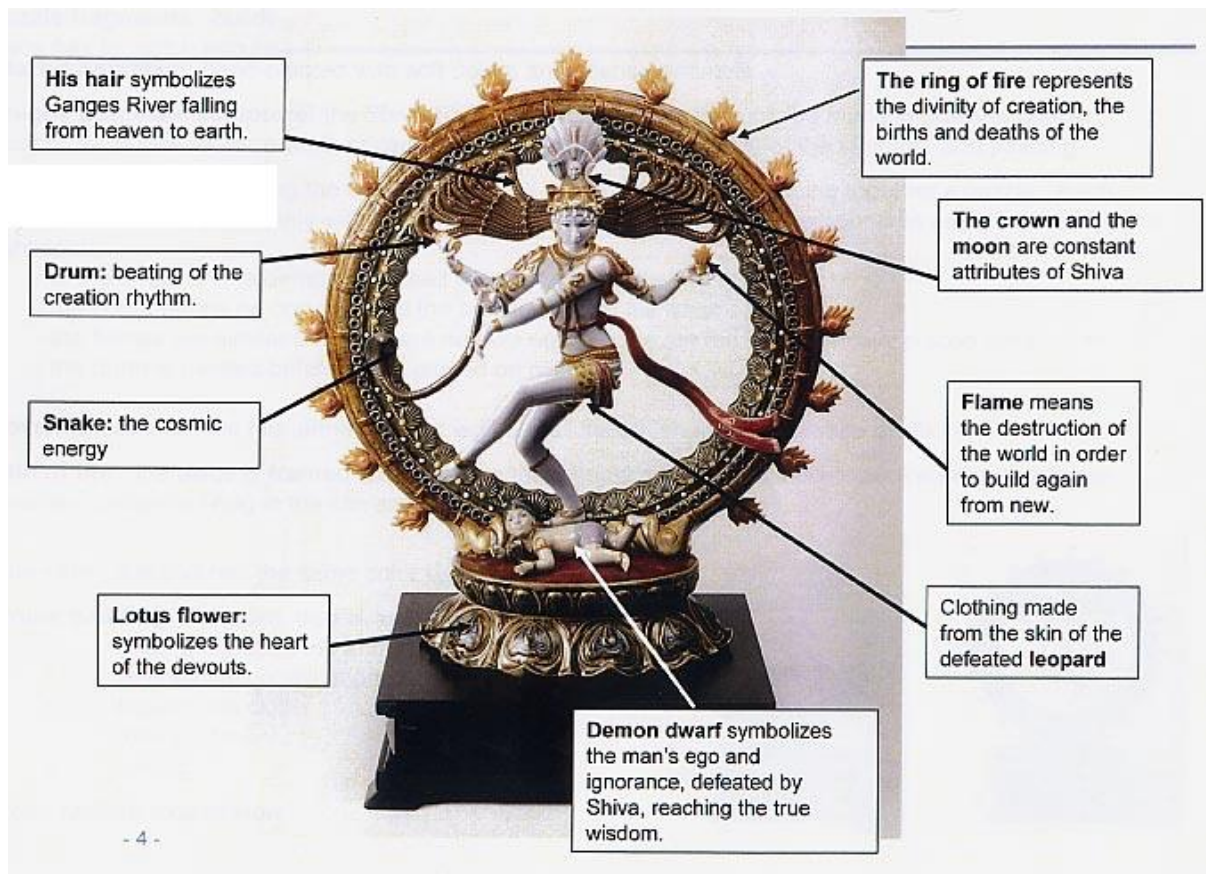
- One of the most recognisable and revered images of Lord Shiva in Hinduism is the Nataraja idol, which represents his function as the Lord of Dance.
- A stunning example of Indian sculpture and workmanship is the Nataraja idol from the Chola period.
- A strong and prominent dynasty that ruled across South India, the Chola dynasty reached its height during the ninth and thirteenth centuries CE.
- The Chola emperors were generous supporters of religion, culture, and the arts.
- **The Nataraja idol was probably made during the rule of Rajaraja I (985–1014 CE) or Rajendra Chola (1014–1044 CE), who was Rajaraja I's son.**
- The **lost wax (cire perdue) casting** method was used to create the majority of the bronze Nataraja statues from the Chola era.

The Evolution of Nataraja



SYMBOLISM OF THE NATARAJA IDOL

- **TANDAVA DANCE:** It reflects the dynamic and rhythmic cycles of creation, preservation, and destruction in the cosmos as represented by Shiva's cosmic dance, known as the Tandava.
- **APASMARA:** Apasmara, a demon that represents ignorance, is generally crushed under Shiva's foot while he stands on one leg, representing the victory of knowledge over ignorance.
- **FOUR ARMS:** Shiva's four arms are holding a variety of symbolic items, such as a drum, fire, which represents destruction, and a raised hand that is blessing his followers.



SOURCE- A GLIMPSE OF HISTORY

PANCHAKRITYA - THE FIVE KEY ACTS OF THE NATARAJA:

1. **Srishti (Creation):** The Nataraja's rear left arm wields the damaru drum, symbolizing the vibrations that create the universe, often paralleled with the Big Bang theory.
2. **Samhara (Destruction):** The raised rear right hand holds the fire of transformation, not destruction, signifying constant change and echoing the idea of "There's no being, only becoming."
3. **Sthithi (Maintenance/Protection):** The open palm of the forehead assures that cosmic changes are normal, and Nataraja is here to protect, maintaining the balance of the universe.

4. **Tirobhava (Concealment):** The hidden lower-left palm points downwards, signifying Nataraja's role as the creator of illusion or maya, the veil of ignorance.
5. **Anugraha (Blessing/Liberation):** The raised left foot and closed hand offer seekers the choice of moksha, liberation from ignorance, and freedom from the cycle of birth and death.

