



News Analysis (06 Mar, 2020)

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## Fuel Cell Technology for Disaster Management

### Why in News

The **International Advanced Research for Powder Metallurgy & New Materials (ARCI), Hyderabad** has developed **Polymer Electrolyte Membrane Fuel Cells (PEMFC)**.

ARCI is an **autonomous Research and Development (R&D) Centre** of the Department of Science and Technology (DST).

### Polymer Electrolyte Membrane Fuel Cells

- PEMFC convert the **chemical energy stored in hydrogen fuel directly and efficiently to electrical energy** with **water as the only byproduct** without the need for grid power as required by conventional battery backup systems.
- **Potential:** To reduce energy use, pollutant emissions and dependence on fossil fuels and providing sustainable electricity.
- **Advantage:** Operational capability at low-temperatures with applications in decentralised power generation systems.

### Key Points

- The ARCI has developed in-house PEMFC systems in the **power range of 1 to 20 kiloWatt (kW)** at its **Centre for Fuel Cell Technology, Chennai**.
- ARCI is planning to set up a PEMFC system at **Tamil Nadu State Emergency Operation Centre (TN SEOC)** as a disaster management measure.

Tamil Nadu is generally affected by five to six cyclones every year, of which two to three are severe.

- In general, **Emergency Operation Centres (EOC)** backed with a **10 kW system** along with **fuel cell stack**, air moving subsystems, power control devices and control and monitoring system is being planned as a natural disaster management measure.
  - EOCs have been set up in the states as per the **National disaster Management Guidelines**.
  - An EOC is the hub to coordinate various activities during emergencies. The basic functions of the EOC includes collection and dissemination of early warnings on disaster, ensuring administrative and community preparedness and coordinating with all emergency support functions.
  - Fuel cell systems in EOCs offer a potential benefit in terms of providing sustainable electricity.
- **India is vulnerable to a large number of disasters.**
  - Disaster risks in India are further compounded by increasing vulnerabilities related to changing demographics and socio-economic conditions, unplanned urbanization, development within high-risk zones, environmental degradation, climate change, geological hazards, epidemics and pandemics.
  - There has been a **paradigm shift in the focus of Disaster Management**, from response-centric (rescue, relief, rehabilitation, and reconstruction) to laying greater emphasis on the other elements of disaster management cycle (prevention, mitigation, and preparedness) as a means to avert the impact of future emergencies.

**Source: PIB**

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## New Test with Quantum Coins & Computers for Quantum Sensing

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### Why in News

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Researchers from the **Raman Research Institute (RRI)** (autonomous institution under the Department of Science & Technology) have devised a new test for fairness of **quantum coin or qubit using entanglement theory**.

### Key Points

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- The test uses **entanglement** to test the fairness of the quantum coin. Their strategy enables **better discrimination between quantum states**. Such an advantage is valuable in quantum sensors
- This is a significant contribution to quantum state discrimination and an essential aspect of quantum information science which is expected to influence quantum sensing.

## Quantum Information and Quantum Computing Technology

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- The domain of Quantum Information and Quantum Computing Technology is a growing area of research which is expected to influence **Data Processing**, which in turn, plays a central role in our lives in this Information Age.
- For instance, bank transactions, online shopping and so on crucially depend on the efficiency of information transfer.
- Thus the work on quantum state discrimination is expected to be valuable in people's lives in the current era.

### Qubit

- A quantum bit, or qubit, is the **basic unit of information for a quantum computer**, analogous to a bit in ordinary machines.
- But unlike a bit, which can have the value 0 or 1, a qubit can take on an infinite number of values.

### Quantum computer

- A quantum computer is any device for computation that makes direct use of distinctively **quantum mechanical phenomena**, such as superposition and entanglement, to perform operations on data.
- **Superposition** means that each qubit can **represent both a '1' and a '0' at the same time**
- **Quantum entanglement** occurs when **two particles become inextricably linked**, and whatever happens to one immediately affects the other, regardless of how far apart they are.

Entanglement is a special type of correlation that exists in the quantum world with **no classical counterpart**.

### Source: PIB

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## Gender Parity Index: UNESCO

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- **Gender Parity Index** in primary, secondary and tertiary education is the ratio of the number of female students enrolled at primary, secondary and tertiary levels of education to the number of male students in each level.
- In short, GPI at various levels **reflect equitable participation of girls** in the School system.
- GPI is **released by the United Nations Educational, Scientific and Cultural Organization (UNESCO)** as a part of its **Global Education Monitoring Report**.

- A **GPI of 1 indicates parity** between the sexes; a GPI that varies between 0 and 1 typically means a disparity in favour of males; whereas a GPI greater than 1 indicates a disparity in favour of females.
- **India's GPI for the year 2018-19** at different levels of School Education is as under:
  - Primary Education: 1.03
  - Upper Primary Education: 1.12
  - Secondary Education: 1.04
  - Higher Secondary Education: 1.04
- India's GPI indicates that the **number of girls is more than the number of boys** at all levels of school Education.
- In 2018-19, the Ministry of Human Resource Development launched the '**Samagra Shiksha**' scheme. It is a **Centrally Sponsored Scheme**.
  - It is an overarching programme for the school education sector extending from pre-school to class XII and aims to ensure inclusive and equitable quality education at all levels of school education.
  - One of its objectives is to bridge social and gender gaps in school education.
  - To provide quality education to girls from disadvantaged groups, **Kasturba Gandhi BalikaVidyalayas (KGBVs)** have been sanctioned in Educationally Backward Blocks (EBBs) under SamagraShiksha.
  - KGBVs are residential schools from class VI to XII for girls belonging to disadvantaged groups such as SC, ST, OBC, Minority and Below Poverty Line (BPL).

**Note: Educationally Backward Blocks** are drawn on the basis of **twin criteria** of Female Literacy Rate and Gender Gap in Literacy. However, some blocks have been identified only on the basis of Female Literacy Rate also.

**Source: PIB**

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## Initiatives Launched during India Smart Utility Week 2020

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### Why in News

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Recently, the **India-European Union Flagship Call on Integrated Local Energy Systems** was announced at **India Smart Utility Week 2020**.

Additionally, **Sweden and India** have also announced the **India-Sweden Collaborative Industrial Research & Development Programme** during the event.

### India Smart Utility Week 2020

- India Smart Grid Forum (ISFG) has been organising its flagship **annual** event, India Smart Grid Week (ISGW) **since 2015**. It has been renamed as **India Smart Utility Week (ISUW) in 2019**.
- It is considered as **one of the top five international events on Smart Grids and Smart Cities**.
- ISUW 2020 will be organised as an International Conference and Exhibition on Smart Energy and Water for Smarter Cities.
- It will bring together the world's leading smart energy experts and researchers to discuss trends, share best practices and showcase next-generation technologies and products in smart energy and smart cities domains.

## India-European Union Flagship Call on Integrated Local Energy Systems

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- The partnership between Indian and **European Union** will help to **strengthen cooperation in energy research and innovation**, mainly in **renewable energy** and its integration in the energy system.
- It will also help to find solutions encompassing local integration across various energy vectors and increase the share of renewables in the energy mix and high energy efficiency.
- The programme is in line with both the European Union's and India's involvement in **Mission Innovation (MI)**.

### Mission Innovation

- Mission Innovation (MI) is a **global initiative of 24 countries and the European Commission** (on behalf of the European Union) working to reinvigorate and accelerate **global clean energy innovation** with the objective to **make clean energy widely affordable**.
- MI was announced at **COP21** on November 30, 2015, as world leaders came together in **Paris to commit to ambitious efforts to combat climate change**.



## 1 GOAL

To **accelerate** the pace of clean energy innovation to achieve performance breakthroughs and cost reductions to provide widely **affordable** and **reliable** clean energy solutions.

## 25 MEMBERS

Launched in 2015 at COP21 in **PARIS**

MI Members represent about 80% of global government investment in clean energy RD&D

## 4 OBJECTIVES



Substantial boost in public sector investment



Increased private sector engagement and investment



Increasing international collaboration



Raising awareness of the transformational potential of energy innovation



## India-Sweden Collaborative Industrial Research & Development Programme

- India-Sweden Collaborative Industrial Research & Development Programme is a **collaborative programme on Smart Grids** at a collective investment of **5 Million US \$** which will help to transform the clean energy sector into a secure, adaptive, sustainable and digitally-enabled ecosystem and provide reliable and quality energy for all.
- It is a **joint Programme**, co-funded by the Indian Department of Science & Technology (DST) and the Swedish Energy Agency.
- It aims to bring together world-class expertise of Sweden and India to **address challenges in the area of Smart Grids**.  
A smart grid is an electrical grid which includes a variety of operation and energy measures including smart meters, smart appliances, renewable energy resources, and energy-efficient resources.
- The project also aims **to develop technologies that can be commercialized after two years** through cooperation between India and Sweden.

**Source: PIB**

# Freedom in the World 2020 Report

## Why in News

The **Freedom in the World 2020 report** has ranked **India at the 83<sup>rd</sup> position** along with **Timor-Leste** and **Senegal**.

- The report is released by **Freedom House, a U.S.-based watchdog**, which has been **tracking global political and civil liberties** for almost half a century.
- The report derives its methodology from the **Universal Declaration of Human Rights**, adopted by the **United Nations General Assembly (UNGA)** in **1948**.
- It covers 195 countries, awarding **scores based on-**
  - **Political rights indicators** such as the electoral process, political pluralism and participation and government functioning.
  - **Civil liberties** indicators related to freedom of expression and belief, associational and organisational rights, the rule of law and personal autonomy and individual rights.

**Deterring democracy**

The Freedom House report said that India showed a deteriorating trend when it came to personal autonomy

Year	Political rights	Civil Liberties	Total Score
2017	35/40	42/60	77/100
2018	35/40	42/60	77/100
2019	35/40	40/60	75/100
2020	34/40	37/60	71/100

**Top five countries in the free category:**  
Finland, Norway, Sweden, Netherlands, Luxembourg

**Bottom five countries in the free category:**  
Botswana, Peru, India, Timor-Leste, Tunisia

Leaders – including the chief executives of the United States and India, the world's two largest democracies – are increasingly willing to break down institutional safeguards – SARAH REPUCCI, SENIOR DIRECTOR OF GLOBAL PUBLICATIONS, FREEDOM HOUSE

## Key Highlights of the Report

- India's **score fell by four points to 71**, the worst decline among the world's 25 largest democracies.
  - India scored **34 out of 40 points** in the **political rights category**, but only **37 out of 60** in the **civil liberties category**, for a total score of 71, **a drop from last year's score of 75**.
  - India is near the bottom of the pile among the countries categorised as **"Free"**, with only Tunisia receiving a lower score.
- The **scrapping of Article 370**, the **National Register of Citizens (NRC)** and the **Citizenship (Amendment) Act, 2019 (CAA)**, as well as the **crackdown on mass protests** have been listed as the main signs of declining freedom.
  - The report criticised the internet blackout in Kashmir, terming it the longest shutdown ever imposed by a democracy.
  - It highlighted that **freedom of expression (Article 19)** is under threat in India, with journalists, academics and others facing harassment and intimidation when addressing politically sensitive topics.
- The report noted that India has long been seen as a **democratic counterweight to China** and hence a **strategic partner for the United States** in the region. However, that view is changing, with India attracting criticism similar to that levied against China.

**Source: TH**

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## Solar Charkha Mission

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### Why In News

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Recently, the **Minister for Micro, Small & Medium Enterprises** gave information about the **Solar Charkha Mission** in **Lok Sabha**.

### Key Points

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- The **Solar Charkha Mission** is an enterprise driven scheme and envisages setting up of **'Solar Charkha Clusters'** which will have **200 to 2042 beneficiaries** (Spinners, Weavers, Stitches and other skilled artisans).
- One cluster would involve a maximum **subsidy of Rs. 9.60 crore** provided in form of **Capital subsidy for individual** and **Special Purpose Vehicle (SPV)**, **interest subvention for working capital** and **capacity building**.
- These solar charkhas are to be operated **using solar power which is a renewable energy source**. It will help in the development of **Green Economy** as it is an **environment friendly programme**. It will also **generate sustainable employment for the artisans**.

## Background

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- The Solar Charkha Mission is a **Ministry of Micro Small & Medium Enterprises (MSME) initiative launched during June 2018.**
- A pilot project on Solar Charkha was implemented at **Khanwa village, Nawada District of Bihar in 2016.** Based on the success of the pilot project, the Government of India had accorded approval to set up 50 such clusters with a budget of **Rs. 550 Crore for 2018-19 and 2019-20.**
- The scheme is envisaged to generate direct employment nearly to **one lakh persons in the approved clusters.**

## Scheme Objectives

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- To ensure inclusive **growth by generation of employment, especially for women and youth, and sustainable development** through solar charkha clusters in **rural areas.**
- To **boost rural economy** and help in arresting **migration from rural to urban areas.**
- To leverage **low-cost, innovative technologies and processes for sustenance.**

**Source: PIB**

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## Bharatnatyam

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### Origin

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- **Bharatanatyam** is one of the **oldest (considered to be over 2000 years old) and most popular forms** of classical dance that originated in **Tanjore district in Tamil Nadu, India.**
- **Bharatnatyam is one among the eight classical dances of India.**
- The origin of this dance can be traced to the sage **Bharata Muni's Natyashastra.**
- The **Abhinaya Darpana** by **Nandikesvara** is one of the main sources of textual material, for the study of the technique and grammar of body movement in Bharatnatyam Dance.
- The style was kept alive by the **devadasis**, the young girls '**gifted**' by their parents to **the temples and married to the gods.**

### Features

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- Bharatnatyam dance is known to be **ekaharya**, where **one dancer takes on many roles in a single performance.**

- The dance involves transitional movements of the **leg, hip and arm**. **Expressive eye movements** and **hand gestures** are used to **convey emotions**. It encompasses **Bhav, Rag, Ras and Taal**.
- This form of dance is **slow and moving**, but at times **fast and fluid** and hence is also called **Fire Dance**.
- The accompanying orchestra consists of a **vocalist, a mridangam player, violinist or veena player, a flautist** and a **cymbal player**. The person who conducts the dance recitation is the **Nattuvanar**.




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## Scheme for Pension and Medical Aid to Artistes

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- The Scheme for Pension and Medical Aid to Artistes is being implemented by the **Ministry of Culture**.
- Objective: To improve the financial and socio-economic status of the old artists and scholars (**not less than 60 years of age**) who have contributed significantly in their specialized fields of arts, letters etc. in their active age or are still contributing.
- **Monthly pension:** An amount of maximum **Rs. 4000/- per month** is being given to each beneficiary, **out of which minimum Rs. 500/- financial assistance from State/UT Govt.** is included.
- **Medical aid:**The Scheme provides for medical aid facilities to an artist and his/her spouse by covering them under a convenient and affordable Health Insurance Scheme of the Government.

## ICONSAT 2020

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### Why in News

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The **International Conference on NanoScience and NanoTechnology (ICONSAT) 2020** is being organized during 5<sup>th</sup>-7<sup>th</sup> March at **Kolkata (West Bengal)**.

ICONSAT is the series of **biennial** international conferences held in India **under the aegis of Nano Mission, Department of Science and Technology (DST)**.

### Key Points

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- The conference intends to bring out **cutting-edge developments** in the domain of physical, chemical, materials as well as biological sciences with the help of nanotechnology.
- The event emphasised on **5Ms – Mechanical, Material, Machines, Manufacturing and Manpower**, and integration of these 5 Ms with nano-science and technology.
- It also aimed to **integrate nanotechnology with sustainable development and new technology** (machine learning, artificial intelligence and so on).
- It emphasized the need to **create a network of experts in nano-science and to collaborate the knowledge across sectors** like energy, agriculture, transport, health and so on.
- It also aims to provide a **potential platform** for **young researchers and students** from **within the country and abroad** to keep pace with the latest development in the emerging areas of Nano Science and Technology.

### Nano Mission

- The Government of India launched the Nano Mission in **2007** as an "**umbrella capacity-building programme**".
- It is being implemented by **the Department of Science and Technology (DST)** under the Ministry of Science and Technology.
- The objectives of the mission are:
  - Basic research promotion
  - Infrastructure development
  - Nano applications and technology development
  - Human Resource development
  - International collaborations

- As a result of the efforts led by the Nano Mission, today, India is amongst the **top five nations in the world** in terms of **scientific publications in nanoscience and technology** (moving from 4<sup>th</sup> to the 3<sup>rd</sup> position).
- The Nano Mission has established national dialogues to promote R&D in the development of standards for nanotechnology and for laying down a **National Regulatory Framework Road-Map for Nanotechnology (NRFR-Nanotech)**.

**Source: PIB**

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## Jeevan Kaushal Curriculum

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### Why in News

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Recently, the Minister of Human Resource Development informed about the implementation of **Jeevan Kaushal (life skills) curriculum** in a written reply in the Lok Sabha.

### Key Points about Curriculum

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- The **University Grants Commission (UGC)** has developed life skills (Jeevan Kaushal) curriculum for **undergraduate students at Universities and Colleges**.
- It covers the courses on communication skills, professional skills, leadership & management skills and universal human values.
- The implementation of curriculum is **suggestive**.
- The **objectives** of the curriculum are:
  - Enhancement of self awareness
  - Creation of emotional competency and emotional intelligence
  - Learning through practical experiences
  - Development of interpersonal skills
  - Time and Stress management
  - Achievement of excellence with ethics.

**Source: PIB**

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