31 Aug 2020: PIB Summary & Analysis

1. World's Largest Solar Tree

Context:

CSIR-CMERI develops the world's largest solar tree.

Details:

- CSIR-Central Mechanical Engineering Research Institute, located in Durgapur, West Bengal, has developed the world's largest solar tree.
- It is installed at CSIR-CMERI Residential Colony, Durgapur.
- Its installed capacity is above 11.5 kWp (kilowatts peak). It has the annual capacity to generate 12,000-14,000 units of clean and green power.
- Features of the solar tree:
    - The Solar Tree has been designed in a manner to ensure maximum exposure of each Solar PV Panel to sunlight and also the creation of the least amount of shadow area beneath.
    - There are a total of 35 Solar PV Panels in each tree with a capacity of 330 wp each.
    - The inclination of the arms holding the Solar PV Panels are flexible and can be adjusted as per requirement, a feature not available in Roof-Mounted Solar facilities.
    - The energy generation data can be monitored either in real-time or on a daily basis.
    - The solar tree has the capability to incorporate IOT based features, i.e. round-the-clock CCTV surveillance in agricultural fields, real-time humidity, wind speed, rainfall prediction and soil analytics sensors.
- These Solar Trees can be aligned with agriculture for substituting price-volatile fossil fuels.
- Each Solar Tree has the potential to save 10-12 tons of CO_2 emissions being released into the atmosphere as Greenhouse Gases when compared with fossil fuel-fired energy generation.
- Besides, the surplus generated power can be fed into an Energy Grid.
- CSIR-CMERI had also developed solar-powered e-Suvidha Kiosks which can also be connected to the solar trees for real-time access to the vast majority of the agricultural database as well as to the eNAM.

What is a Solar Tree?

A solar tree is a structure incorporating solar energy technology on a single pillar, like a tree trunk. It may be a solar artwork or a functional power generator. Basically, they are solar panels mounted atop a long pole. The pole can support multiple panels in different spots, much like branches on a tree.

2. Centre signs Rs 2,580 cr contract for supply of six Pinaka Regiments to Indian Army

Context:

A contract was signed between the Ministry of Defence (MoD) and Indian companies.

Details:

- The Indian companies involved are BHEL, Tata Power Company Ltd., and Larsen & Toubro.

- The contract is for supplying six Pinaka Regiments to the Regiment of Artillery of the Indian Army at an approximate cost of Rs 2,580 crores.
- These Six Pinaka Regiments will be operationalised along the Northern and Eastern Borders of our country further enhancing the operational preparedness of our Armed Forces.
- The induction of Six Pinaka Regiments is planned to be completed by 2024.
- The six Pinaka Regiments comprise:
    - 114 Launchers with Automated Gun Aiming & Positioning System (AGAPS)
    - 45 Command Posts
    - 330 Vehicles
- This project is under Buy (Indian) categorisation, with 70% indigenous content. It is expected to give a huge boost to the 'Make in India'
- The Pinaka Multiple Launch Rocket System (MLRS) has been indigenously designed and developed by DRDO.

3. New way for quantum state estimation

Context:

RRI Scientists find a new way for quantum state estimation that can make crucial quantum operations simpler.

Details:

- Scientists from the Raman Research Institute (RRI) have found a novel way to estimate and characterise quantum states.
    - RRI is an autonomous institute under the Department of Science and Technology, GOI located in Bengaluru.
- Scientists experiment with new ways to manipulate quantum states so that they can be harnessed for computing, communication, and metrology.
- This new method called **Quantum State Interferography**, can help make such manipulations simpler so that several crucial operations in quantum technologies become less cumbersome.
- In this new method, the scientists have found a new way of inferring the state of a system (both two-dimensional qubits, the simplest quantum system as well as higher-dimensional "qubits") from an interference pattern.

Problem with the current method of estimation:

- The determination of an unknown quantum state is usually done by a method known as Quantum State Tomography (QST).
- This involves measuring the projection of the quantum state on various directions in state space and reconstructing the quantum state from the information obtained.
- However, in particular, scenarios where the dimensions are large, the operations needed to perform tomography increase quadratically.
- The experimental settings often need to be changed many times, thus making the process very cumbersome.

'Black Box' Approach:

- The RRI team showed that without changing any settings in the experimental setup, it is possible to infer the unknown quantum state of a higher dimensional system.

- The setup requires only two interferometers from which many interferograms can be obtained to reconstruct the state.
- This provides a 'black box' approach to quantum state estimation - between the incidence of the photon and extraction of state information, conditions within the set-up are not changed, thus providing a true single-shot estimation of the quantum state.

4. Landslide susceptibility mapping of Mussoorie

Context:

Study shows that 15 percent of the region (of Mussoorie and its surrounding areas in Uttarakhand Himalaya) is highly susceptible to landslides.

Background:

- Like most hill townships, Mussoorie, a popular hill station in Uttarakhand, has witnessed several landslides, probably resulting from an increased spate of developmental activities.
- The increased disaster hazard has led scientists to map the landslide susceptibility of Mussoorie and surrounding areas, showing that 15 percent of the region is highly susceptible to landslides.

Details of the Study:

- Scientists from Wadia Institute of Himalayan Geology (WIHG), an autonomous institute under the Department of Science and Technology, Govt. of India, carried out the study in Mussoorie township and its surroundings covering 84 square km in the Lesser Himalaya.
- They found that a dominant part of the area falls under very high and high landslide susceptible zone lies in the settlement area - Bhataghat, George Everest, Kempty fall, Khattapani, Library road, Galogidhar, and Hathipaon.
- The area is also covered by highly fractured Krol limestone exhibiting a slope of more than 60 degrees.
- As per the study, the various causative factors of landslides in the area are lithology, land use-landcover (LULC), slope, aspect, curvature, elevation, road-cut drainage, and lineament.

Read more on landslides in PIB dated Aug 7, 2020.

5. Official Development Assistance loan from Japan

Context:

Japan commits Rs 3,500 crore (approx.) as Official Development Assistance for the health sector to fight the COVID-19 crisis in India.

Details:

- The Govt. of Japan has committed an Official Development Assistance loan of an amount of JPY50 billion (approx. Rs. 3,500 crore) for the COVID-19 Crisis Emergency Response Support.

- This programme loan aims to support India's efforts in fighting COVID-19 and to prepare the health system to manage future epidemics and also to improve the resilience of India's health systems against infectious diseases.
- This Grant-in-aid from the Government of Japan is for providing medical equipment to strengthen the public health and medical system in India. This will strengthen the health care facilities for managing critical and serious patients suffering from COVID-19 infection.