



DATE: 16 AUGUST 2026

1

Green India Mission (Source: The Hindu)

Also called the National Mission for a Green India, is one of the eight missions under India's National Action Plan on Climate Change (NAPCC).

- Launched in 2014
- **It is a centrally sponsored scheme**
- Implemented by the Ministry of Environment, Forest and Climate Change (MoEF&CC).

Aim

- It seeks to protect, restore and enhance India's forest and tree cover while helping the country respond to climate change through adaptation and mitigation measures

Objectives

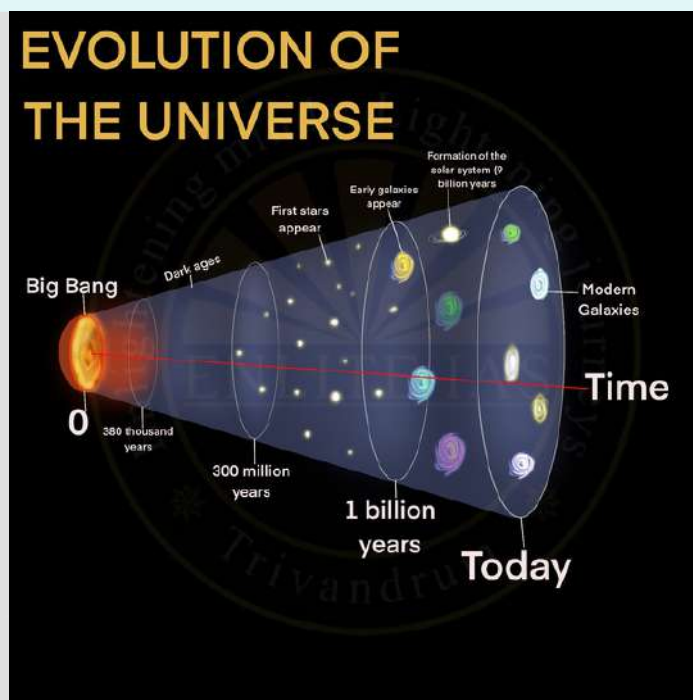
- Increase forest/tree cover on 5 million hectares (mha) of forest and non-forest lands.
- Improve quality of forest cover on another 5 mha (total 10 mha treated).
- Enhance ecosystem services: biodiversity, hydrological services, soil conservation, and carbon sequestration.
- Raise forest-based livelihood income for about 3 million households living in and around forests.
- Boost annual CO₂ sequestration by 50–60 million tonnes (initial 2020 target; later revised with larger 2030 goals).

Ecological Focus

- Forest and tree cover expansion on degraded and non-forest lands.
- Ecological restoration of degraded forests, grasslands, wetlands, mangroves, shifting cultivation areas, scrublands, ravines, cold deserts, and abandoned mining areas.
- Special attention to ecologically critical regions like the Aravallis and Western Ghats.

2 Big Bang Theory (Source: The Hindu)

- It is also called the expanding universe hypothesis.
- Edwin Hubble, in 1920, provided evidence that the universe is expanding.
- Took place 13.7 billion years ago.
- Galaxies move further and further apart. Similarly, the distance between the galaxies is also found to be increasing, and thereby, the universe is considered to be expanding.
- Scientists believe that though the space between the galaxies is increasing, observations do not support the expansion of galaxies.
- **Stages of Development**
 - In the beginning, all matter forming the universe existed in one place in the form of a “tiny ball” (singular atom) with an unimaginably small volume, infinite temperature, and infinite density.
 - At the Big Bang the “tiny ball” exploded violently leading to a huge expansion.
 - The expansion continues even to the present day.
 - As it grew, some energy was converted into matter.
 - There was particularly rapid expansion within fractions of a second after the bang.
 - Thereafter, the expansion has slowed down. Within the first three minutes of the Big Bang event, the first atom began to form.
 - Within 300,000 years from the Big Bang, the temperature dropped to 4,500K (Kelvin) and gave rise to atomic matter.
 - The universe became transparent.



3 Small Modular Reactors (Source: The Indian Express)

SMALL MODULAR REACTORS (SMRs)

Compact Nuclear Power for a Sustainable Future

WHAT ARE SMRs?

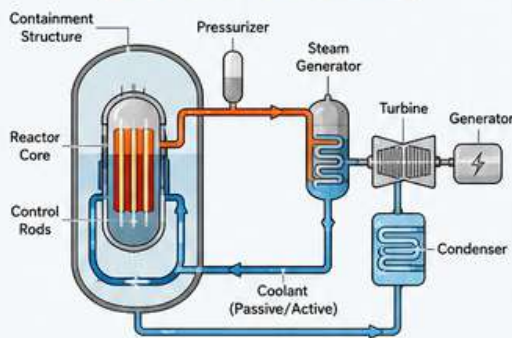
Small Modular Reactors (SMRs) are advanced nuclear reactors with a power capacity of up to 300 MWe per unit.

They are designed to be smaller in size, fabricated in factories, transported to site and installed in modules.

SMRs can generate reliable, low-carbon electricity for a wide range of applications.



HOW DOES AN SMR WORK?



Nuclear fission in the reactor core produces heat that converts water to steam. The steam drives a turbine connected to a generator to produce electricity.

KEY ADVANTAGES



Low-Carbon Energy

Produces large amounts of electricity with very low greenhouse gas emissions.



Modular & Scalable

Factory fabrication enables consistent quality, faster construction and scalability to meet demand.



Cost-Effective

Lower upfront costs and shorter construction time compared to large reactors.



Flexible Deployment

Suitable for remote areas, replacing retiring coal plants and supporting industrial hubs.



Enhanced Safety

Advanced passive safety features reduce risk and enhance reliability.



High Efficiency

Can also be used for desalination, hydrogen production and district heating.

TYPES OF SMRs



Light Water SMRs

Use ordinary water as coolant (e.g., NuScale, BWRX-300).



Advanced Water Reactors

Improved efficiency and safety features.



Gas-Cooled Reactors

Use gas as coolant (e.g., HTGR, Pebble Bed).



Fast Spectrum Reactors

Use fast neutrons for higher fuel efficiency.



Molten Salt Reactors

Use molten salt as coolant and/or fuel.

APPLICATIONS



Electricity generation for grid and off-grid areas



Industrial process heat



Desalination of seawater



Hydrogen production (clean fuel)



District heating and cooling



Mining, data centers and remote communities

BUILT-IN SAFETY FEATURES



Passive Safety Systems

Natural circulation, gravity-fed water and passive cooling reduce reliance on external power.



Smaller Core Size

Less fuel inventory reduces potential radiological consequences.



Robust Containment

Designed to withstand extreme events including natural disasters.



Longer Refueling Intervals

Reduced operational complexity and enhanced safety.

CHALLENGES



Regulatory approval and licensing frameworks are still evolving.



High initial R&D and first-of-a-kind costs.



Need for strong supply chains and skilled workforce.



Public perception and acceptance of nuclear energy.



SMRs represent a new generation of nuclear technology – safer, scalable and sustainable – powering a cleaner tomorrow.

