About the Telescope and its applications

- The Thirty Meter Telescope (TMT) is a new class of extremely large telescopes that will allow us to see deeper into space and observe cosmic objects with unprecedented sensitivity.
- With its 30 m prime mirror diameter, TMT will be three times as wide, with nine times more area, than the largest currently existing visible-light telescope in the world. This will provide unparalleled resolution with TMT images more than 12 times sharper than those from the Hubble Space Telescope.
- When operational, TMT will provide new observational opportunities in essentially every field of astronomy and astrophysics.
- The TMT will enable scientists to study fainter objects far away from us in the universe, which gives information about early stages of evolution of the universe. Also, it will give us finer details of not-so-far-away objects like undiscovered planets and other objects in the Solar System and planets around other stars.

Countries involved in its construction:

The $2 billion project is a joint venture (JV) involving five countries:

1. **USA** (California Institute of Technology)
2. **Japan** (National Institutes of Natural Sciences of Japan),
3. **China** (National Astronomical Observatories of the Chinese Academy of Sciences)
4. **India** (the Department of Science and Technology)
5. **Canada** (National Research Council)
Why does India want the project side to be shifted to an alternate site?

- The project has been marred by protests for over a decade. The proposed site is considered sacred to indigenous Hawaiians, and also has too many observatories for one more such massive establishment to come up.

- The difficulty is that even if construction in Mauna Kea were to go ahead, there could be future agitations.

- Protests at the site last year saw scientists unable to access other telescope facilities in Mauna Kea. The project has been delayed by nearly five years and should have begun operations by 2025.

- India has committed $200 million, which is about a tenth of the proposed cost. The telescope needs 492 precisely polished mirrors and India is to contribute 83 of them. The project delay has meant that these manufacturing contracts have also been delayed.

- The level of contribution determines the amount of viewing time, or slots, that the member-countries' scientists get on the machine. Thus India, in a given year, stands to get 10% of the available slots; any downtime could potentially eat into those.

Where is the proposed alternate site?

- The next best site to locate the telescope is the Observatorio del Roque de los Muchachos (ORM) on La Palma in the Canary Islands, Spain.

- Hanle, in Ladakh, was also in the running to host the TMT, but lost out to Mauna Kea, which is considered a superior site due to the imaging possibilities it offers, its stable weather, and also because it has the necessary infrastructure to manage telescopes, already being host to several telescopes.

Roadblocks in its construction
The TMT has been a litigious site since 2014. In 2018, the Supreme Court of Hawaii gave permission for construction to proceed but the project’s proponents have not made progress because they were obstructed twice, in 2015 and 2019, respectively, from construction.

Representatives from member countries are expected to convene in Los Angeles in February to decide on project modalities.

India too has its problems with hosting ambitious science projects. The Indian Neutrino Observatory, proposed to come up in Theni, Tamil Nadu, has also been stalled due to protests against the project in the State.