GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA

UNSTARRED QUESTION NO:1513
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THIRTY METER TELESCOPE
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Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether India has been participating in the Thirty Meter Telescope (TMT) Project;

(b) if so, the details in this regard along with the salient features of the TMT Project;

(c) the name of the other countries participating in the said project and the nature of activities proposed to be undertaken by India in TMT project;

(d) the details of the departments of the country which are likely to undertake assignments in the said project; and

(e) the extent to which Indian science sector is likely to benefit from the said project?

Answer

MINISTER OF SCIENCE AND TECHNOLOGY AND MINISTER OF EARTH SCIENCES (DR. HARSH VARDHAN)

(a) Yes, Madam.

(b) The Thirty Metre Telescope (TMT) will be an optical and infrared telescope with 30-metre diameter primary mirror. The primary mirror will consist of 492 segments of 1.44-metre diameter each. TMT will also employ integrated Adaptive Optics (AO). AO corrects for atmospheric turbu- lence, thereby making the telescope function as if it is situated outside earth's atmosphere. With its size and AO technology, TMT is expected to be 10 times better in spatial resolution, and more than 20,000 times better in sensitivity compared to the famous Hubble Space Telescope. The TMT project has entered its Construction Phase and the cost of India's participation at 10% level in the Construction Phase will be Rs. 1299.8 crores. This will be shared between Depa- rtment of Science & Technology (DST) and the Department of Atomic Energy (DAE). DST's share will be Rs. 675.25 crores and DAE's share will be Rs. 624.55 crores. The Construction Phase of the project will be completed in 2022-23.

(c) The other countries participating in the project are USA, Canada, China and Japan. India will contribute towards the Construction Phase both in cash and in kind. The items to be cont- ributed by India in kind include Primary Mirror Segments, Primary Mirror Segment Support Assembly, Primary Mirror Coating Chambers, Secondary/Ter- tiary Mirror Coating Chambers, Primary Mirror Actuators, Primary Mirror Edge Sensors, Primary Mirror Segment Control, Telescope Control System, Infrared Multi Object Spectrograph Subsystems and Observatory Software. These items will be manufactured by laboratories and industries in India as per international standards and then supplied to the TMT project as India's in-kind contribution. Besides this, Indian researchers will also contribute towards the project by carrying out various scientific studies.

(d) In India, TMT project-related activities will be led by the Indian Institute of Astrophysics (IIA), Bengaluru in collaboration with the Arya- bhatta Research Institute of Observational Sciences (ARIES), Nainital and the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune. This is a national project and the best of expertise, wherever available, among country's research and educational institutions and industry, will be leveraged for carrying out project-related acti- vities. Among the Government Departments, DST and DAE will be jointly funding and overseeing the implementation of this project.

(e) The Indian science sector will benefit both scientifically and technologically from partici- pation in this project. On the technology front, design, prototyping, testing, validation and manu- facturing of various in-kind items mentioned in part (c) above will bring in know-how for new and cutting-edge technologies. These will have long- term spin-off advantages for the country, for example in setting-up a large 8-10 metre class segmented mirror telescope in the country in future. On the scientific front, after commi- ssioning of TMT in 2022-23, India will get 25-30 assured observational nights on the TMT. This will enable Indian astronomers to study front-ranking scientific problems such as formation and evolution of stars, planets and galaxies, the chemical evo- lution and composition of the Universe, stellar explosion physics, the early Universe, origin and nature of dark energy, etc.