The importance of states in space missions

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August 27, 2023

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Premium

The success of governments in landing spacecrafts on the moon indicates that states can be powerful and competent actors

August 28, 2023 01:05 am | Updated 11:48 am IST

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Chandrayaan-3’s Pragyan rover roams around the ‘Shiv Shakti Point’, which is the Vikram’ lander’s touchdown spot, on the moon. | Photo Credit: PTI

On August 23, with Chandrayaan-3’s lander module making a soft landing on the moon, India became only the fourth country after the erstwhile Soviet Union, the U.S., and China to accomplish this achievement. It is a testament to the remarkable ingenuity of Indian scientists that this feat was carried out at a relatively low cost.

Three of these four countries have been late industrialisers; with only one “developed” nation, the U.S., among them. This throws up interesting questions: what factors allow for resource-constrained economies to pull off ambitious programmes? What lessons do they hold for our ability to combat challenges? Do such programmes represent a diversion of resources and attention from the pressing needs of development?

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Important factors

By some estimates, the USSR was 50%-60% the size of the U.S. economy in the 1960s, when it landed the first spacecraft, Luna 9, on the moon. According to World Bank data, when measured in purchasing power parity terms, China's per capita income was around 22% that of the U.S. in 2013 at the time of its moon landing. In contrast, India's per capita income in 2022 was only 10.9% that of the U.S. Clearly, a relative shortfall in resources does not always pose a constraint in achieving ambitious scientific outcomes.

One clue could perhaps lie in human resources. China, India, and the U.S. are the world's most populous nations, and have been since the 1970s; Russia ranked in the top four in the 1970s. China, Russia, and India laid a lot of importance on science and technology in their post-war/post-colonial development trajectory. Their current successes are the results of those initial investments. China, for instance, filed the most patents in the world in 2019. The large numbers of potential scientists and engineers in these countries provide a clue to the successes of these nations in space exploration despite not being as rich as the developed world.

However, the successes of the UAE's space programme downplay the importance of population. The UAE is richer in per capita terms than the U.S., but with a population of roughly nine million in 2023. In 2020, with the help of Japan, the UAE launched the Hope probe that entered Martian orbit in 2021, making it the fifth country after Russia, the U.S., China, and India to achieve this feat. This is a remarkable achievement considering that the UAE Space Agency was only inaugurated in 2014.

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Perhaps the most important factor is the role of the state. In 2022, the head of the Emirates Mars Mission, Omran Sharif, stressed the importance of the “triple helix model”, where the government, the private sector, and academics worked together, and not in silos, to achieve objectives. An active and capable state, as opposed to an intrusive and domineering one, can help establish frameworks and procedures that overcome financial constraints and enable the harnessing of important resources like skilled workers. Though the private space industry is growing, it is still only governments that have enabled spacecrafts to land on the moon.

A question often raised is whether developing economies, with problems such as poverty, can afford the diversion of valuable resources to such ambitious programmes. One problem with such objections is that it is only directed at developing economies, as though developed nations have no internal problems to speak of. In the documentary *Summer of Soul,* African-American participants at a music festival in 1969, held at Harlem, New York, expressed their opposition to Neil Armstrong’s historic moon landing. They cited civic infrastructure and racism as issues requiring urgent action, and said that the space programme diverted resources and attention. Yet the Apollo missions are considered triumphs on the part of humanity.

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The question of whether resources directed to space programmes are a diversion from pressing development needs, however, is a valid one. As an answer, one can uphold the importance of these programmes in material and scientific terms. The knowledge gleaned from these missions will contribute to human progress, and ISRO's demonstration of its ability to launch satellites at relatively low costs can attract business and revenue from private players.

A true partnership

More importantly, it forces us to re-evaluate the role of the state. The multiple crises besetting the world indicate the inability of the private sector to tackle them unaided. The dichotomy between state and markets, where the state is simply a referee, is no longer valid. What is required is a true partnership between the two, with active intervention of the state in order to provide the space for ingenuity to flourish. The success of governments in landing spacecrafts on the moon indicates that states can be powerful and competent actors. In her book *Mission Economy*, the economist Mariana Mazzucatto studies the role of the U.S. government and NASA in coordinating the activities of different actors and organisations, private and public, in order to achieve the Apollo moon landings. Much of her work examines how the state can foster innovation and success in modern-day economies.

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No doubt, social problems such as climate change and hunger are very different when compared to well-defined objectives such as landing on the moon. But our successes in space show us the road map for navigating concerns on earth. An inclusive and secular state, committed to building the capacity required to ensure genuine human development, is the need of the hour.

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