Challenges in Manned Mission to Space

What is the issue?

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- Indian Space Research Organisation (ISRO) has recently announced the definitive timeline for Gaganyaan mission. Click here to know more
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- The mission has few fundamental challenges and some of the key technology elements are already in place.
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What is India’s plan on manned mission to space?

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- ISRO has announced its first manned mission which is set to be a reality by 2022, and it has started working on various modules of this project.
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- The GSLV Mk-III or LVM-3 launch vehicle is capable of propelling a crewed module into orbit.
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- The budget for launches was also cleared.
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- Future launches will be used to fine-tune the cryogenic engines.
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- Re-entry, a delicate operation, that ISRO has limited experience in since its payloads typically remain in space, was also tested in a GSLV Mk-III flight.
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- Institute of Aerospace Medicine provides inputs which is required for acclimatising astronauts, testing their fitness for space at the time of launch, and for the design of their quarters and life support systems.
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What are the challenges?

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- For a manned mission, the key distinguishing capabilities that ISRO has had to develop include the ability
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i. to bring the spacecraft back to Earth after flight
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ii. to build a spacecraft in which astronauts can live in Earth-like conditions in space
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- The problem of weight is the fundamental challenge.
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- As, a crewed module weighs two or three times more than the communication satellites and remote sensing payloads that ISRO usually launches.
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- The only hardware which remains untested is the crew capsule, suitable for keeping two or three astronauts in good health for over a week.
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- Elements include systems to maintain the environment, provide food and process waste, and deal with emergencies, these are still on the drawing board.
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- An astronaut training centre was scheduled to be set up by 2012 in Bengaluru, but it appears that the first batch of astronauts will have to be trained overseas.
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- It would take years to accustom them to life in zero gravity, which has impacts on a myriad behaviours, from moving around to even eating and drinking.
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What is the way forward?

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- It is true that human space flight no longer signals national prestige, as it did during the Cold War.

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- But the project would bump up the entire space industry, forcing it to meet challenges beyond the low-cost launch of payloads, a sector in which it has already excelled.
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- Besides, certain missions are better performed by humans than by robots.
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- These remain far in the future, but the development of human capabilities in space would prime the industry well in advance.
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- The technical knowledge generated in the process would be of use much later, in ways that may not be obvious today.
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Source: Indian Express

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