



One-Way Ticket to Mars: The Hoax and its Redress

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Going by Hindu philosophy Mars is the God of war: wild, brash and adventurous. Little wonder that it draws people of like nature onto its fold. A television project called Mars One of Holland sought volunteers for its reality show on a trip to Mars. Regardless of the fact that it has neither the credence, experience nor expertise of national space agencies like NASA, ROSCOSMOS, ISRO etc, it landed up with over 200,000 volunteers from over 140 countries. The trip is a one-way trip and up to 62 Indians are reportedly selected. Apart from expertise, the company has neither the equipment nor funds inherent to such an endeavour. NASA, which boasts of an annual budget of over \$ 17-18 Billion, finds itself short of funds, whereas Mars One with much less than a billion believes it can carry people to Mars. As of the previous month, Mars one by 'crowd funding' has been able to garner nothing more than \$ 314, 000¹. Quite intriguingly, the earliest date NASA sets for a Mars landing is 2030 whereas commercial firms declare landing dates from 2018 onwards. Most alluringly, Mars One also doesn't demand the exacting physiological and psychological standards common to astronauts across the world. So then, quite a few adventurers rush in for a Mars adventure, little aware of what awaits them.

The fear of the unknown and unexplored fires their imagination and unlike an average tourist who seeks a large amount of fun and a small measure of adventure, they seek the opposite and rush headlong regardless of danger and damage. Quite apparently, a one-way ticket to an unknown, unearthly and unchartered destination like Mars seeks to fulfil the urges of adventurers rather than the average tourist seeking nothing more than a break from the mundane. This is especially so when one considers that neither has

technology nor legislation matured to support such an endeavour. The possibility of their return (at least in one piece) is remote. They are perhaps also driven by the popular image of intrepid explorers discovering new lands (*Mundus Novus*) and making enormous fortunes. Speculation based on assumption, myth, movies and popular literature is rife. Little wonder, then that at trip costs of nothing more than five to seventy Dollars² and very basic requirements of being emotionally and physically fit a huge mass of humanity rushes in to make the Mars trip with TV companies rather than their national space agencies. However, divested of the associated romance and assumptions, a more prosaic picture is evident when one looks at the inhibiting factors like the interplanetary distances, the physiological and psychological issues related to the Martian atmosphere, the radiation, surface temperatures, the gravity effects etc.

To begin with, at present levels of rocket technology, the interplanetary trip to Mars takes around 270-300 days, far more than any conceivable road, rail or air trip on earth. A suitable 'launch window' opens every two years for a chemical rocket trip of the above duration. After three to four months, a return launch window opens that takes as much time to return. Cruising interplanetary distances appears formidable; landing and habitation are equally so in many more ways than one. Mars unlike earth has a very thin atmosphere and spacecraft's enter the Martian atmosphere at a screaming 24,000 kph. Even after slowing down with a parachute or inflatable, it would be traveling well above the speed of sound. Pretty obviously, one of the main issues with landing humans on Mars is figuring out how to slow down so as to not smash into pieces. A lightweight robotic crawler like the rover may crash or survive. But can a human being be subjected to such risk?

The prevailing dismal rate of successes in Mars missions also inspires little confidence in the endeavour. The statistics are revealing; of the 45 Mars attempts since 1958 more than half failed. More than two-thirds of the Mars missions have been lost due to launch failures, component malfunctions, communication losses and other errors that sent them crashing onto Mars or missing the planet altogether. Going by the statistics, no country has made it to Mars in the first try. Even if a super human survives the sojourn and lands, the next shock awaiting would be the cold, barren surface of Mars that is too

inhospitable to harbour life as understood on earth. It has temperatures ranging from 20 degrees Celsius to minus 150 degrees. More importantly, because of the low atmospheric pressure, within minutes the skin and organs would rupture, outgas and produce a quick painful death. Protective suits for guarding against such issues are being designed and await comprehensive test and certification. Apart from temperatures and low pressure are the ultra-tiny dust storms flying around the planet for billions of years. These are not quite like anything on Earth. The particles are known to be toxic, carcinogenic, and full of perchlorates that cause problems in the thyroid gland. One would also have to contend with the lack of oxygen (0.1% as opposed to earth's 20%). And last but not the least, the usual colours, sights, sounds, birds and tress, etc of earth's biosphere are absent on the lifeless planet of Mars.

However, the spirit of adventure is hardy and may override earthly comforts and prudence. One may get lucky and be amongst the few to make the trip. Returning from the trip would be a greater exercise since the human body evolved over thousands of years to earth's gravity. It is yet to evolve or adapt to the zero gravity of space flight or one third gravity of Mars. Depending on the duration of space flight, a variety of debilitating changes occur in the human body ranging from loss of muscle mass and strength up to 50%, bone demineralisation, cardiac arrhythmias, kidney stones, cancer, loss of immunity etc. Perhaps it was all of these issues that caused a NASA study: "Exploring the Moon and mars: Choices for the Nation" to conclude that a human space programme for Mars was too premature and risky. The Congressional Budget Office of the US in year 2014 reinforced the conclusion by recommending complete elimination of the Mars human space programme.

Everything for a Mars mission ranging from payments to trying, testing of equipment etc is undertaken on earth. The enterprise is nascent at best, technologies are immature and the sceptre of failure has a looming presence. Hence, state agencies like NASA, ROSCOSMOS, CNES, ISRO are cautious in making statements on placing humans on the Martian soil. The possibility of commercial players with no space exploration experience and with much lesser resources being able to provide space settlements within time frames far lower than established national space agencies appears incredulous and extraordinary. The easier recourse would be to dismiss them on grounds of gullibility.

However, the fact that the general public turns to commercial providers rather than their national space agencies indicates to an obvious disconnect between state endeavours and aspirations of private parties. The disconnect is further evidenced in the fact that the largest number of Mars applicants are from the world's leading space faring nation – the US, followed by citizens from other prime space players like Russia, China, Europe, India etc.

Thus, there exists a requirement to take cognisance of aspirations and balance them with the inherent complications, to temper fantasy with reality and streamline efforts to attain aspirations. There exists an apparent groundswell of human will, resolve and aspiration. It makes better sense to harness these energies and resources rather than quell them with complexities and challenges. Dismissing the aspirations on grounds of gullibility would be the easier, though not prudent recourse. Amongst the plethora of fantasies and imagination would lie that one odd extraordinary thought of a “Clarke’s Orbit”³ that makes geostationary satellite communications a reality. Harnessing the disparate thoughts from across the world is an eminently better option than dismissing them and hence it makes sense to provide an institutional mechanism for including and developing them. The existing situation calls for increased state intervention, involvement and intermingling of the state, organisations involved and individuals interested. Such actions need not be confined to states and their respective citizens but could gradually expand to combine existing multinational disparate endeavours into a single cooperative effort.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

¹ Ref statistics on crowd funding site IndieGOGO available at <https://www.indiegogo.com/projects/mars-one-first-private-mars-mission-in-2018>.

² Ref Alan Boyle, “More than 2,700 pay up for a chance to take a one-way trip to Mars”, *NBC News*, 10 Sep 2013.

³ For details on Sir Arthur C Clarke’s proposal on the geostationary satellite communications see Arthur C Clarke, “V2 for Ionospheric Research”, *Wireless World*, Feb 1945 available at <http://lakdiva.org/clarke/1945ww/>