

A Strategic Technological, Ethical and Socio-Legal Frame Work for a Sustainable Lunar Colonization

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ABSTRACT

Sooner or later, with vast technological prowess at our behest, our natural future course of action will be to expand Space Exploration and colonization. The first step towards realizing this dream would be establishing a Surface Base on Moon. Any further step towards this would involve number of strategic technical, ethical, socio-legal issues.

The technological challenges involve,

- 1) Crew safety, crew survivability, adequate provision to overcome contingencies, and in-situ resource utilization.
- 2) Extra-vehicular activity, Life Support, Dust mitigation and control, Human-Robotic Interactions, Power management and Habitat Design.
- 3) Space Traffic Management System for the Moon.
- 4) From debris creation to debris reduction.
- 5) Pursue technologies to remove or recycle debris.
- 6) Designing a robust, retrievable archive with storage in both Moon and Earth,
- 7) Defining archive contents essential for both immediate survival and longer-term recovery.

The ethical challenges involve,

- 1) Whether the in-situ resource exploitation will be only for carrying out further missions to other planets from Moon or for utilization on Earth.

- 2) Will the long term impact of pollution on Moon due to technologies employed for power generation and other logistics on Surfaces justifiable?

The socio-legal frame involves,

- 1) Given the choice of potential landing sites, where does one “drop” a spaceport that is accessible to all parties?
- 2) How is control of the spaceport handled: by joint declaration, straw votes, or what?
- 3) Human settlements in space, in particular the first few to be established, require advance political systems since they have to be internally politically administered
- 4). Focus on the criteria for the safe use of a nuclear reactor on the Moon.
- 5) Form an international body to seek out and implement debris reduction strategy – It must be non-political and non-military.
- 6) International legal regime.
- 7) Re-Engineer the Moon Treaty.

Much of this is not new and none of it would be easy. This paper elaborates the views of the authors on the above topics.