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STUDY OF THE TECHNICAL AND ECONOMIC FEASIBILITY OF ESTABLISHING
SELF-SUFFICIENT HUMAN HABITATS ON MARS

Abstract

The eventual colonization of Mars represents a historic milestone in space exploration and poses unprecedented technical, economic, and logistical challenges. This study focuses on assessing the feasibility of establishing self-sufficient human habitats on Mars, with the goal of ensuring the long-term survival and prosperity of colonists.

First, the technologies required for the construction and operation of habitats in the Martian environment, including enclosed life support systems, food production, and power generation, are analyzed. The unique challenges associated with cosmic radiation, reduced gravity, and limited availability of local resources are also considered.

In addition, a detailed study is made of the costs involved in establishing and maintaining a human presence on Mars, considering factors such as transportation of materials from Earth, construction of infrastructure, and provision of basic supplies. Possible funding models and international collaboration to meet the enormous costs associated with this undertaking are also explored.

Preliminary results indicate that while the creation of self-sufficient human habitats on Mars presents significant challenges, it also offers unique opportunities for the expansion of human civilization beyond our home planet. An interdisciplinary and collaborative approach is required to address these challenges and make the vision of Martian colonization an achievable reality in the near future.