

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

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LUNAR AGRICULTURE FARMING FOR THE FUTURE

Abstract

As NASA prepares to return to the Moon with the upcoming Artemis program as a stepping stone to Mars, humans will be required to survive in outer space for longer periods of time and in harsher environments. As humanity gets closer to living off world, we need to consider the complexities that will make this possible and the steps towards reaching this goal. Recommendations are made for the early stages of a lunar farm. These recommendations include the use of semi-subsurface or subsurface structures for a lunar farm to mitigate the impact of harmful radiation, micrometeorites and severe temperature variations; and the construction of a settlement at a polar location, to increase insolation and access to water ice. Food sources, including plants, cell cultures, and insects, have been selected for their nutritional value and ability to create diverse meals that suit the physiological and psychological requirements of humans. The construction and management of the lunar farm must align with international treaties, including the Outer Space Treaty, and therefore an international authority model is likely to be the most appropriate management structure for the farm. Although further scientific research is required before the realization of the lunar farm, it is expected that by implementing these recommendations, the farm would be a viable option for sustaining humans on the Moon.