**AN EXPERIMENTAL STUDY OF LUNAR RECONNAISSANCE BASE WITH THE ROBOTIC EMPLACEMENTS.** Jayashree Sridhar, High school student,C-3 Icl Jubilee Apartments, No 16 Second Main Road, GandhiNagar, Adyar, Chennai-600020, Tamil Nadu, India.+91-24424969,+91-42115269, jayashree92@yahoo.co.in.

**Introduction:** The capabilities for humans to explore the moon have suffered from high projected costs of space-flight hardware development and production. An avenue for reducing these costs is proposed. Establishing a Permanent Moon Base with a robotic regolith harvesting system offers a safe, efficient approach to performing menial tasks required during exploration missions, such as site preparation and regolith collection. To evaluate the effectiveness of this strategy, cost assessments were performed and compared to estimates based on a more conventional lunar exploration scheme. The results indicate that an architecture emphasizing early production and utilization of lunar propellant has lower hardware development costs, lower cost uncertainties, and a reduction in human transportation costs of approximately fifty percent. Robotic systems launched ahead of manned missions can prepare the site and assure working on-site systems prior to crew arrival.

**Reduction of Cost:** Robotic infrastructure can be Economical in 3 ways:

1) They do not require life support systems, allowing greater payloads with lower development costs;

2) With smaller margins of safety, unmanned missions can use less expensive supplies;

3) It can deliver equipment from which following human explorers can use local resources.

**Reduction of Risk:**

1) Robotic precursor missions can test transportation vehicles before regular manned use, and help to develop the long-term missions to other planets.

2) Established in-situ supplies lower the risk that an accident leading to critical supply loss during transportation (e.g. Apollo 13) could strand astronauts.

3) Robotic systems reduces the risk to the health of astronauts at the moon base, by reducing the number of tasks that the astronauts must make to set up the base, by burying the base under regolith, to reduce radiation exposure to the astronauts.

**Conclusions:**

Maintenance of the lunar base will require constant support of the robotic system to minimize risks to astronauts while simultaneously harvesting in situ resources. The proposed modular, semi-autonomous approach lowers cost, increases power and mass efficiency, increases versatility, reduces radiation and dust exposure to humans.

**Table shows the facilities that can be employed on the moon**

| LUNAR FACILITY | SOURCE OF INPUT | EXPECTED OUTPUT |
|---|---|---|
| Research Lab | Lunar soil | Research Products |
| Mining | Lunar soil | Slag, residuals, rocks, free iron natural gas, |
| Chemical Processing | Beneficiated soil, solid chemicals. | Organic wastes |
| Mechanical Processing | Organic waste, lunar oxygen, hydrogen, mixed lunar gases. | Material for lunar facility, repairs, replacements. |
| Biological Processing | Oxy gas, carbon-di-oxide and water | Food water and air residual. |
| Fuel Station | Ice ,Helium -3 , Hydrogen | LOX/LOH |
| Electricity | Solar Power | Highly Efficient and reduces the cost of the operation |

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**References:**

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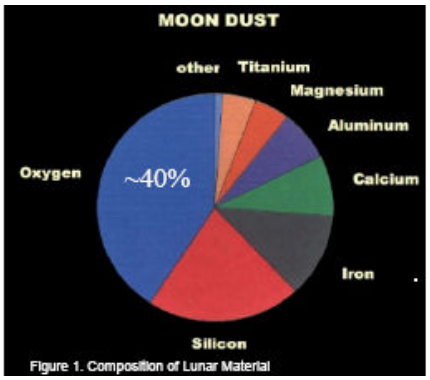

Figure 1. Composition of Lunar Material