

In-Situ Resource Utilization for further exploration of the Moon.

B. Thakore, S. Podhajsky

International Space University, Strasbourg, France (Bijal.Thakore@masters.isunet.edu / Fax: +33 388-655447 / Phone: +33 388-655430)

In-Situ Resource Utilization (ISRU) is the concept of “living off the land”. Initially proposed in the mid 20th Century, many experts have suggested that ISRU is an important enabler for the expansion of humanity beyond the confines of limited resources on Earth. However, even today, ISRU remains a relatively underdeveloped and under-demonstrated in current exploration roadmaps.

This paper summarizes the proposals of an interdisciplinary study carried out by 27 students from 17 different countries at the International Space University. The study reviewed the past and present ISRU techniques and related robotic technologies in the context of complementing the Moon and Mars exploration scenarios of the major space faring countries. The economic viability and benefits of ISRU are examined, together with the regulatory, ethical and cultural aspects of space resource utilisation.

The renewed opportunities for moon exploration have rekindled interest in ISRU as an enabling technology. It is important to assess both the tangible and intangible benefits of this technology in order to evaluate the technical and economic feasibility of adopting it in support of human exploration of the Moon, Mars and beyond.