

Off-Earth mining in the context of sustainable development

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ABSTRACT

As Earth's population continues to grow, there are questions about whether Earth can sustain everyone's needs. Sustainable development is becoming increasingly difficult as certain resources begin to diminish on Earth, while the population continues to rapidly increase. It is natural that we might look to space to supply Earth with resources that are necessary for our continued development. The Moon, Mars and asteroids all contain useful indigenous resources, which has led to interest in off-Earth mining from several national space agencies and private space enterprises. With innovations continuing to reduce the cost of space travel, it is likely that resource extraction in space, in some form, will become a reality within the next decade. However, like Antarctica and the deep sea, space is considered a global common, a resource belonging to all of mankind. With no clear international space law regarding ownership of space resources, an issue arises regarding who, if anyone, should profit from the exploitation of these resources. While returning resources from other celestial bodies back to Earth has the potential to provide considerable benefits to civilisation, there is also the possibility that if a "first in, first served" approach to claiming space resources is taken we may reinforce inequalities that exist on Earth rather than reduce them. Low- and middle-income countries may find it difficult to compete with space mining organisations from high income countries, resulting in unequal access to space resources. This approach may also result in permanent extra-terrestrial environmental impacts that could prohibit certain space activities for future generations, inhibiting sustainable development. This study considers off-Earth mining in the context of sustainable development, investigating potential issues and possible solutions.

Keywords: sustainable development, ethics, off-Earth mining