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Assuring a Safe, Secure, and Sustainable Space Environment for Space Activities (4)

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DEVELOPING CRITERIA FOR SUSTAINABILITY IN THE ORBITAL ENVIRONMENT

Abstract

Space debris continues to be a growing problem. Although several solutions have been proposed, progress on the policy front remains slow. Understanding the interests of the myriad stakeholders affected by the problem and developing criteria to evaluate plausibility are crucial first steps that need to be taken before any proposed solution can be implemented.

The debris issue has been characterized as a “tragedy of the commons,” a concept first popularized by ecologist Garrett Hardin in 1968 to describe common-pool resource (CPR) problems. Later work by economist Elinor Ostrom critiqued Hardin’s theory that privatization or government takeover were the only possible solutions, finding several real-world examples of resource appropriators, local officials and other stakeholders successfully working together to manage CPRs. However, more recent scholarship has argued that Ostrom’s framework may not translate directly to every CPR management issue, particularly when looking at global commons such as the oceans, the atmosphere and outer space, due to issues of size and scale. Still, as the Secure World Foundation’s Brian Weeden and others have noted, Ostrom’s framework seems to provide a solid foundation for addressing orbital debris and wider questions of space governance, although it is in need of modification. Likewise, work by Paul Stern concludes that Ostrom’s framework can be useful for governing both the global commons and emerging technologies with the addition of further principles.

Building on the aforementioned research, this paper expands on the efforts to adapt Ostrom’s framework and principles to the issues of space debris and space governance. It surveys the approaches used in the management of comparable global commons—including the atmosphere, the Antarctic, the oceans, the emerging commons of the Internet, and existing efforts regarding the orbital environment—and summarizes the lessons they can provide for the debris issue. It also seeks to fully elucidate the interests of each stakeholder group, from established space powers to developing countries, businesses and the global public in order to develop a set of evaluative criteria that any solution must meet in order to have a chance at both policy effectiveness and political adoption. Finally, these criteria will be applied to a sample set of proposed solutions to the orbital debris problem in order to illustrate their practical utility.