

論文要旨説明書

報告論文のタイトル : Collective funding for the protection of the global commons under asymmetric benefits

報告者・共著者 (大学院生は所属機関の後に (院生) と記入してください。)

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論文要旨 (800 字から 1200 字、英文の場合は 300 から 450 語)

The challenges associated with managing shared resources have frequently been highlighted in economic scholarship. Owing to the pursuit of self-interest by individual members of society, shared resources tend to be overexploited, leading to suboptimal consequences for society as a whole, a situation often referred to as the “tragedy of the commons”

This paper examines a particular form of cooperative mechanism aimed at encouraging the investment of greater effort in the preservation of the global commons in the context of space debris mitigation, namely, a collective fund dedicated to the promotion of mitigation efforts. Space debris comprises disused human-made objects in space, including abandoned satellites and launch vehicle parts. Pieces of space debris may collide with and disable functioning spacecraft, thereby posing a significant threat to space activities.

This paper employs a game theoretic model to analyze the behavior of potential benefactors of such a fund under the existence of asymmetry in benefits received by the benefactors, which reflects the real world situation where the exploitation of outer space is subject to significant technological constraints and differences in technological capabilities result in differences in the benefits derived from outer space utilization. With a simple two-player game reflecting the nature of a collective fund where the players can choose its level of contribution from a continuous range of value, and the same level of contributions from different players have the same mitigation effect, this paper demonstrates not only that such a fund would not attract optimal funding levels but also that the players’ only sensible response would be that, irrespective of the degree of asymmetry in benefits, all contributions should come from the player who receives the relatively larger benefit from the global commons while the other player should contribute no funding at all. This implies that such a fund would struggle to attract contributions from actors who derive relatively fewer benefits from the global commons.