

# The Lockean Proviso and Orbital Sustainability

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Over the last decades, human have witnessed the gradual commercialization of the Earth orbit. The exponential development of private space activities makes this distant natural field, with the overcoming of technological difficulties, more and more hospitable to free initiative and entrepreneurship. However, the orbital space is considered global commons. Through the imaginary case method, researchers intend to ponder on possible ways to legally regulate the exploitation of the orbital space, namely the application of Pigouvian taxes, on the sustainability of the orbital environment, through ethical considerations originating from the application of the Lockean proviso.

orbital environment

pollution

sustainability

Pigouvian taxes

conservation of resources

Lockean proviso

## 1. Introduction

Moral positioning regarding environmental issues is becoming increasingly relevant in public discourse. As an argument, moral reasoning has always had an impact on political decisions, helping to legitimize medium and long-term strategies. The awareness of a shared vulnerability faced with global environmental hazards can become a strong motivating factor in promoting the pro-environmental behavior, as well as in favoring and implementing environmental policies <sup>[1]</sup>.

Given the actual magnitude of the pollution generated by technological activities in natural environments, not taking into account the ethical aspects in the political decision-making process can jeopardize the legitimate interests of future generations on a global scale. Therefore, focusing on the impact of moral sensitivity on environmental policies is a topic of current interest. In this respect, the adoption of international laws needs a common moral ground, in order to enforce rules and regulations for the long-term protection of the global environment. However, an eventual synchronization of national policies seems to remain a long-term intergenerational goal <sup>[2]</sup>.

Human exploration, as well as commercial and military activity outside the Earth's atmosphere are growing in scale and intensity with each passing decade. Drawn by convention and constantly overtaken, the famous Kármán line appears less and less to human as an immutable frontier. That hostile and anonymous natural wilderness beyond it receives identity and value as it is humanized through knowledge and action. Kanon argues that exploring and exploiting its resources may become necessary in order to ensure the long-term sustainability of humanity's vital

resources [3]. Given that the sustainability of the terrestrial environment is now threatened by global pollution, it is possible that the survival of humanity will depend on the exploitation of extra-terrestrial resources.

Rosenberg points out that human have been witnessing, for several decades now what might be called a de facto colonization of Earth's orbit. Any colonization has long-term effects on the environment, as has happened whenever mankind has spread to new continents [4]. Over the last decades, human have witnessed the gradual commercialization of Earth's orbit. The exponential development of private space activities makes this distant natural field, with the overcoming of technological difficulties, more and more hospitable to free initiative and entrepreneurship [5]. In the context of the current trend of re-launching the space industry, in addition to civilian space systems and military equipment already present in the Earth orbit for many decades, human are witnessing an unprecedented intensification of commercial activity, especially in Low-Earth Orbit. New business opportunities are emerging in the field of global internet services. Further developments such as the future creation of in-situ orbital conveniences would be extremely profitable for low-latency data providers [6].

Ongoing projects such as telecommunications satellite networks, which aim to provide global connectivity services and for which ongoing in-orbit maintenance becomes a condition of feasibility, pose increasingly serious problems related to the long-term sustainability of the orbital environment. Access to outer space can bring huge economic benefits. From this point of view, the immediately relevant aspect of human activity in space is the commercial exploitation of Earth's orbit. As private initiative in Earth's orbit cannot currently be legally controlled strictly enough, the orbital environment can become a completely unrestricted area of freedom of action.

## **| 2. Sustainability of the Orbital Environment**

Although still in an early phase, the concern about the exploitation of extraterrestrial natural resources is increasingly emphasized upon when it comes to environmental sustainability. There are contributions from proactive, anticipatory authors coming from the applied ethics area or from case law, even if, given the relative novelty of the debate, they are not very thorough. These contributions remain valuable because they are critically positioned in a constructive way in relation to current and future environmental policies. Researchers will present briefly some bibliographical landmarks, in order to familiarize the non-specialized reader with the topic of researchers' debate.

Given that global sustainability is increasingly threatened by pollution and that the coordination of national policies in a timely manner remains difficult, Kanon's position is of particular relevance. It claims that, due to technological advances, the prospecting and exploitation of resources outside the Earth should be taken into account in order to safeguard the common interest: the sustainability of the vital resources of a humanity that consumes more and more of the surrounding terrestrial nature. It claims that human survival is likely to depend, in the not too distant future, on the intensive exploitation of alien resources, as a solution to protect the terrestrial environment [3].

Regarding the issue of ensuring the sustainability of the, increasingly exploited, orbital environment and starting from the finding that private entities do not invest on their own initiative in environmental risk management, Oz,

Bullock and Johanson propose proactive solutions based on legal analogies. Oz states that the legal regime for the exploitation of riparian basins, a common local resource, currently regulated in such a way that it does not jeopardize the interest of future generations, be adapted and applied to the orbital environment—a common global resource [7]. Alternatively, Bullock and Johanson advocate for the management of environmental risks assumed by the trade exploitation of the orbit through the financial stimulation of private operators to invest in sustainability [8].

From the perspective of environmental ethics, the issue of the sustainability of the orbital environment falls under a pro-environmentalist discourse that has constantly pressed environmental policies since the middle of the 20th century. The problem of intergenerational justice remains as current in the new historical conjuncture. Attfield, for example, insists that the conservation of natural resources on a global scale is a moral imperative because current generations must leave behind a world whose capacity of ensuring vital needs is not reduced in any way [9].

Given the constant interest, growing exponentially, of the private entrepreneur for the exploitation of the orbital environment, authors such as Rosenberg and Pilchman anticipate that, given the alert rhythm of the advancement of space technologies, asteroid mining or helium mining from the Moon are quite plausible scenarios to be considered. This draws attention to risks of an ethical nature. Rosenberg states that human are witnessing a de facto colonization of the orbit with long-term consequences on the global environment. He argues that Locke's eighteenth-century reflections are of surprising relevance [4]. Indeed, the Lockean concept of original appropriation allows for consideration of any newly discovered, virgin part of nature through the perspective of a relevant opposition for sustainability issues, that between civilization and wildness. Nature exploitation is not only permitted but even desirable, while economic behavior must always reflect moral sensitivity to the environment. In order to not damage future acts of individual appropriation of a part of extraterrestrial nature, one should observe three ethical requirements synthesized in what is known as the Lockean proviso. Pilchman argues that the logic of the original appropriation allows for the formulation of moral objections against the possibility of a legally unrestricted exploitation of the extraterrestrial environment [10].

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