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## **Beneficiaries of the New space Age: Governance by Following the Benefits to all Humankind**

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### **Abstract**

Of the three most fundamental principles of outer space law is the endeavour for space to be for the benefit of all. The economic implications of this principle are often either unaccounted for or misrepresented within the discussion on this “benefit of all” principle. Exploring the economic consequences of space activities allows an interpretation of the benefit for all principle which may enable decision makers in space governance to consider, and facilitate, the net social value of space activities. This research considers the traditional approaches to interpreting the principle and offer the economic approach as a novel interpretation. The discussion also distinguishes on the nature of end-beneficiaries of traditional space activities compared to NewSpace activities. Ultimately, this paper asks whether a re-calibration should be considered on the approach to the benefit to all principle to better assist international organisations in ensuring space activities actually bring the most potential benefit they can to humankind.

**Keywords:** economics, NewSpace, law, benefit.

### **Acronyms/Abbreviations**

BOA      Benefit of All (Principle)

## **1. Introduction**

### *1.1 Overview*

All space activities, whether under the management of individuals, companies, states or international organisations, are ultimately governed by international space law. This field of law is comprised of soft law acting, as guidance, and actual law, which forms the enforceable rules. Both types of law are first and foremost established through the instruments produced under the framework of the United Nations.

Soft law instruments often come about by way of resolutions adopted by the General Assembly. Actual law is established through treaty regimes whereupon states party to the United Nations Convention deliberate and ratify black letter law accepting (symbolically, at least) that law will be binding upon them.

Under both soft and actual international space law exists a principle that the uses of outer space must be for the benefit beyond those who are engaging in any particular use. Often labelled “benefit-sharing”, this paper considers the benefit for all principle more widely so as to not restrict discussion to the midframe of sharing.

The benefit of all principle is the subject of much discussion and is yet to meet any consensus as to its

interpretation or application. This paper discusses this particular principle and offers an interpretation which is likely to bring it greater social impact, a point from which decision makers can actually employ that principle as a method to facilitate improvement in society.

### *1.2 Significance*

The soft law and actual law contexts of the benefit of all principle came about prior to any real privatisation of space activities and without NewSpace being at all considered. Outer space was the domain of states. Consequentially, the benefit of all principle is not designed to facilitate the opportunities and risks of commercial or other non-government space enterprises.

While academic literature and discussion at the United Nations addresses the benefit of all principle, there is a lack of definitiveness on how to reasonably and appropriately implement that principle, and how to do so in a way which does not deter NewSpace activities (particularly in-space resource activities, as to which see part 3.2 below). Much of the deliberation on the benefit of all principle. This paper suggests the absence of consensus is due to the international space law community not having adequately considered the economic realities of space activities, namely by the value those activities give to individuals and to groups in societies, despite nationality or degree of technological capability.

Looking at the benefit of all principle from an economic perspective allows a consistent interpretation and application of the principle in the interests of international cooperation and the peaceful use of outer space. It is this economic perspective through the lens of basic economic principles, rather than financial, fiscal or scientific agendas, which serves as a novel aspect in the greater discussion on this principle.

In considering the economic implications of space activities, decision makers (namely states and international organisations) may follow the rational outlined in the present paper. Doing so offers a real likelihood that more people will benefit from space technologies than is the case presently under the “benefit-sharing” approach.

### 1.3 Methodology

In arguing for the benefit of all principle to be seen from the point of the value space activities afford to society generally, this paper first outlines how the principle came into being and how it is formally interpreted. Recent proposals on how to deal with the BOA Principle in the context of space resources is considered as an example of how the principle may be applied.

Part 4 of this paper uses economic principles to contextualise the value space activities bring to society despite no “benefit sharing” obligations or framework. Part 5 breaks down certain nuances of the BOA Principle, particular in relation to the meaning of “benefit” and considering who is intended to be the recipient of any benefit. Part 6 concludes the discussion with a proposal for moving forward.

## 2. The Benefit of All Principle

### 2.1. Declaration and Treaty

Following the peak of the Cold War, states undertook efforts through the auspices of the United Nations in an attempt to ameliorate domination and the weaponization of outer space by any one power. The initial manifestation of this intention was resolution 1721 (XVI) adopted by the General Assembly in 1961 emphasising the importance for international cooperation and the peaceful uses of outer space.<sup>[1]</sup>

The following year saw the adoption of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (**Declaration of Legal Principles**).<sup>[2]</sup> After several years of discussion thereafter, in 1967 the Outer Space Treaty<sup>[3]</sup> became open for signature, acting as the primary legal authority in international space law and, by virtue of its Article VI, domestic space law. Both the Outer Space Treaty, and the Declaration of Legal

Principles from which it is based, establish an ambitious and rather vague ideal for space activities to generally be carried out for “the benefit of all”.

Without needing to even consider application or practicality, two immediate questions arise under the drafting of this ideal:

- a) what is the meaning of “benefit” and
- b) who is captured under the term “all”?

The international space community until today remains uncertain on what these definitions are.

### 2.2 . . . for the Benefit of All

Paragraph 1 of the Declaration of Legal Principles reads the “exploration and use of outer space shall be carried on for the benefits and in the interests of all mankind”. The Outer Space Treaty’s Preamble encompasses this by stating (emphasis original) “[b]elieving that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development”. This benefit of all principle is from here referred to in this paper as **BOA Principle**.

The legal implications of BOA Principle, however, go further than the Preamble of the Outer Space Treaty and make it into the actual provisions of the treaty. Article I of the Outer Space Treaty posits that the “exploration and use of outer space . . . shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind”.

Then there is the Moon Agreement,<sup>[4]</sup> the Preamble of which reads (emphasis original) “[b]earing in mind the benefits which may be derived from the exploitation of the natural resources of the Moon and other celestial bodies”. Albeit with a low ratification number, the Moon Agreement further requires an international regime be established, one of the purposes of which is for an “equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon, shall be given special consideration”.

In 1996 the United Nations General Assembly passed adopted the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (**Space Benefits Declaration**)<sup>[5]</sup> which came about largely due to states with low standards of living seeking to give further attention to the BOA Principle. The Space Benefits Declaration is discussed in part 3.1 below.

### 2.3 Context of the BOA Principle

The origin of the BOA Principle came about due to from the founding principles of the United Nations on the Committee of the Peaceful Uses of Outer Space through GA Resolution 1348 (XIII). Among these principles is the desire to “promote energetically the fullest exploration and exploitation of outer space for the benefit of mankind”<sup>[6]</sup>. During development of the Legal Principles Declaration, the matter of exploitation was raised, with select states in the South American continent seeking to draw from this that “exploitation” meant all states are entitled to benefit from the uses of outer space.

When it came time to agree on the Outer Space Treaty, the Soviet Union’s proposal (in response to that of the United States’) suggested the purpose of such a treaty would be to explore space for the benefit of all mankind.<sup>[7]</sup> This aspect was ultimately discussed in some detail as to whether the principle should be exclusively to the treaty’s Preamble or be included as a provision.

There was an imbalance, with the desire of developing nations to place a barrier to monopolisation of outer space by the developed nations on the one hand against those developed nations, mainly those in the west, arguing the vagueness would pose challenges for implementation. The resolution to this conflict was to, as Lai puts it, reach a compromise between the states by placing the BOA Principle in the treaty as a provision, yes, but doing so within the first article to serve as an “introduction”, bringing outside of merely an aspiration in the Preamble but not seen as a monitored or strictly-structured duty.<sup>[8]</sup>

The final wording under Article I, however, lists the use and exploration of outer space be for the benefit of not humankind, but for “all countries”. Humankind under the Outer Space Treaty in this context is tied to the “province” of outer space. Another note on the final drafting, pointed out by Mason-Zwaan and Hoffman,<sup>[9]</sup> is that while Article I may apply to the “exploration and use of outer space” it does not necessarily apply to the Moon and other celestial bodies. If this interpretation is accepted, this draws a distinction between space activities generally as compared to activities concerning space-derived resources (see part 3.2 below).

## 3. Approaches to the Benefit of All Principle

### 3.1 Interpretations

On the aspirational level, it is widely taken that the BOA Principle intends to facilitate the benefit of space activities extending beyond the state engaging in those activities.<sup>[10]</sup> However, when it comes to the strict

application and scope of how the provision is read, there exist two primary approaches – the globalist and the restrictive.

The **globalist interpretation** sees the principle being fulfilled where profits obtained through non-government actors in outer space are distributed to states, whether or not those states were involved in the arrangements which yielded those profits <sup>[11]</sup>.

The **restrictive interpretation** also focuses on distribution beyond the actors engaging in space activities but suggests the BOA Principle does not apply to financial gains of using outer space but, rather, to the scientific information about outer space.<sup>[12]</sup>

The interpretation taken by the Space Benefits Declaration is more restrictive rather than globalist. Instead of explicitly stating profit-sharing between states (or between non-governments and states), paragraph 3 of the declaration reads:

*[a]ll States, particularly those with relevant space capabilities and with programmes for the exploration and use of outer space, should contribute to promoting and fostering international cooperation on an equitable and mutually acceptable basis. In this context, particular attention should be given to the benefit for and the interests of developing countries and countries with incipient space programmes stemming from such international cooperation conducted with countries with more advanced space capabilities.*

This approach has established a legal (albeit soft law) pathway for implementing the BOA Principle, a noteworthy example being in the context of space resources.

### 3.2 Implementation: Space Resources

The advent of space resource activities, including mining and in-situ utilisation, has garnered increasing interest in the last ten or so years. This raises several questions in international space law. The BOA Principle is no exception, whereby stakeholders have been considering how to practically give effect to this idea of “benefit sharing”.

In 2019 the Hague International Space Resources Governance Working Group published the *Building Blocks for the Development of an International Framework on Space Resource Activities (Hague Building Blocks)*. The BOA Principle is considered in the first paragraph of the Hague Building Blocks, which suggests that an international framework should “create an enabling environment for space resource activities that takes into account all interests and benefits all countries and humankind”.<sup>[13]</sup>

When it comes to implementation of the BOA Principle, paragraph 13 of the Hague Building Blocks mostly follows the restrictive interpretation, insofar as “States and international organizations responsible for

space resource activities shall provide for benefit-sharing through the promotion of the participation in space resource activities by all countries, in particular developing countries”.

More specifically, paragraph 13 gives examples of what “benefit sharing” may look like, including:

- a) developing space science and technology and of its applications
- b) developing relevant capabilities and cooperation in education and training for interested states and
- c) access to and exchange of information.

Following these examples, paragraph 13 makes it clear that any international framework dealing with space resources “should not require compulsory monetary benefit sharing”.

The rationale for the restrictive interpretation taken by the Hague Building Blocks is to recognize “the interests of pioneer operators, assuming the early risks and burden of a novel and complex space activity”.[<sup>14</sup>] Indeed, this remains the primary conflict in the BOA Principle discussion, where a balance is sought between rewarding the actors who make efforts and take risks on the one hand and preventing those same actors from dominating the space environment or space-derived capabilities at the expense of non-space fairing states on the other.

This lack of clarity surrounding the BOA Principle risks any real growth in confidence amongst the non-government sector, as well as limiting the development of the NewSpace itself [<sup>15</sup>].

## 4. End-Beneficiaries and Value

### 4.1 Consumers and end-beneficiaries

Economic terms (including the term “economics” itself) are seldom used in accordance with their proper, that is technical, meanings. Defining certain terms associated with economics allows decision makers, or others applying the BOA Principle, to consider new, and fortunately helpful, approaches to its interpretation. Such new approaches may alleviate the need to deal with the competing interests of commercial entities and governments as well as between states themselves and society generally, and encourage a collaborative discussion rather than argumentation on whether globalist or restrictive is the better way forward.

In the context of the BOA Principles, an important distinction exists between the economic term “consumer” and “end-beneficiary”. The former is typically used to refer to a customer purchasing a good or service, an example being a wheat farmer who purchases a satellite-derived Internet of Things system to increase efficiency of his or her operations. An end-beneficiary, however, is

often further removed from that space capability (and the market transaction concerning that space capability) but is nevertheless benefited by the farmer using the IoT system. This benefit comes about through having access to more, to cheaper or to an increased quality of wheat products, such as flour, bread or biscuits.

Under this context an end-beneficiary of the IoT satellites may be a mother or father purchasing bread at a bakery. Although, we can move back further still and recognise the end beneficiary need not even make the purchase of the bread, as is the case with the children of that parent when they eat that bread. In this vein end-beneficiaries would also exist by way of recipients of that farmer’s bread provided by food banks and aid organisations to communities without food security.

Such stakeholders have no involvement in, or contribution to, the mission supporting the satellite which provides the wheat farmer’s IoT system. Yet, their lives are improved because of the actors who did contribute to making those satellites operational. This reality is perhaps more evident when looking at satellite providing services which support emergency management or environmental protection. Those satellite-derived services offer society a greater value than was available prior to the satellites being developed, launched and operated.

### 4.2 What is value?

There is minimal literature and discussion considering the BOA Principle in the context of value. Most of the deliberation on the principle looks at the concept from a distribution obligation placed upon space actors rather than considering how end-beneficiaries are better off because of those space actors’ activities.

An economic description of value places the BOA Principle in a more practical framework, allowing it to be applied more concretely, and in the (even if indirect) interests of society. In its economic context, people experience value when they achieve something they desire which is scarce. This (economic) value is expressed by choosing to act upon that particular scarcity instead of acting in any other way. In the case of the recipients of bread delivered by an aid organisation, value is experienced by those receiving the bread as well as the those who have provided the bread. In both cases, humans have acted upon a decision based on their value. The recipients valued the bread and the providers valued the objective being achieved.

Expressed in this way, the economic, or value, perspective generally is not novel or profound but its application to the BOA Principle seems to have yet been seriously considered. Yet the positive implications of value in this meaning, if followed by decisions makers,

such as states and international organizations, are immense.

## 5. Sharing Money or Offering Value

### 5.1 What is “benefit”?

Both the globalist and restrictive interpretations of the BOA Principle (discussed in part 3 above) assume that space activities benefit only those who engage in them. This part 5 demonstrates why this is a reductionist approach which dismisses the reality of the economic principle discussed in part 4 above.

While the restrictive approach does not consider benefit in the context of money, it nevertheless is based on a false notion that those engaged in space activities are not compliant with the BOA Principle unless they engage proactively with other “less technologically developed” states.

Considering the benefit of space-derived activities in this economic context means the BOA Principle is best able to benefit society when an open playing field exists for NewSpace actors to engage in space activities. The reason is evident when we think about who actually experiences value from those activities.

### 5.2 Who benefits from NewSpace activities?

For a comprehensive discussion on space’s benefits to humanity generally, Olla’s 2009 collection *Space Technologies for the Benefits of Human Society and Earth* can be consulted.<sup>16</sup> While international organisations do not dismiss the benefits to humanity which naturally derive from space activities,<sup>17 18</sup> somewhat ironically, this perspective seems less appreciated (or, certainly less prevalent) when it comes to governments, international organizations and academics actually deliberating on the BOA Principle itself. This part 5.2 seeks to address this gap in the discussion.

Rather than only looking to the immediate outputs of a space mission (i.e. the mission’s objectives and any revenue or political capital which comes as a result), the economics/value perspective allows greater consideration for areas of society most in need space-derived product and services, whether or not governments, international organisation or non-state actors are aware of those groups..

It is accepted that social good comes from many satellite services, such as disaster management and environmental protection. However, when it comes to space-based resources, this social good is less apparent in discussions. Like any mining operation, the end-beneficiaries of in-space resources are not the customers of iron ore or lithium, but the people whose lives are

benefited by the goods and services those minerals produce and provide.

The lack of discussion on this point may step from one of the distinctions between the principle as it appeared in the Declaration and then in the Outer Space Treaty. The former, as soft law, encourages the “exploration and use” of outer space be pursued for the “benefits and in the interests of all mankind”. The substantive test of the Outer Space Treaty seems to have clarified what “mankind” means in this context. Article I of the Outer Space Treaty retains the “exploration and use” element but does not seek the “benefit to and in the interests of all” element be to mankind. Rather, article I reads “. . . for the benefit and in the interests of all countries”. A not uncommon phenomenon in law, where only the change of one word can have significant consequences.

A “state” and a “society” are not the same thing and can each hold vastly different desires and needs. This leads to differing values and priorities. That is not to say the state and society are always misaligned in their desires, but the opposite is neither true. A state is an institution with special authority not afforded to any other individual or group of individuals. By contrast a society is a collection of individuals and groups who are answerable to the authority of one state or another, and includes nationals or nationally-registered organisations. The interests of a family or small community living in an area affected by a natural disaster, for instance, are not immediately the same as the state under whose authority that family or community lives. In such situations interests and incentives are usually greatly different. And this is the case even without considering special interest groups or lobbyists. A pertinent question, then, is whether uses of space, and by extension the BOA Principle, is intended to benefit states or the individuals and societies within those states.

### 5.3 International law and end-beneficiaries

By seeking the BOA Principle be in the interests of countries rather than mankind, the Outer Space Treaty refined the scope of this principle to favour states in preference over the societies under a state’s authority. A reading of the Space Benefits Declaration (see part 3.1 above), which came nearly three decades after the Outer Space Treaty, supports this approach, the title of which even makes clear “. . . for the benefit and in the interest of all states”.

It seems international space law does not prioritise end-beneficiaries in its frameworks. We can, then, look to comparatives to consider where other areas of international law focus on society rather than the state foremost. Perhaps the most obvious example is international human rights law.

The Universal Declaration of Human Rights was adopted by the General Assembly in 1947 following World War II in attempt to recognise equal and inalienable rights of every human.<sup>[19]</sup> Interestingly, Article 27 speaks explicitly about benefits, whereby “[e]veryone has the right to freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits”. Here, international law has given an express right to individuals to benefit from scientific advancement. Moreover, article 27 does not restrict itself to finances or science, but to art and culture but, importantly in contrast to the international space law, the benefits of science (as opposed to benefit-sharing). This is in line with the value-perspective in economics when considering end-beneficiaries. In other words, the Human Right Declaration is more in line with economic reality than the Outer Space Treaty and many interpretations of the BOA Principle which came thereafter.

While the Human Right Declaration is not actual law, but an instrument of soft law, there are of course treaty frameworks which are legally binding in respect of being in the interests of society before the state. Examples include the European Convention on Human Rights, (which stems from the Human rights Declaration), the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. Such rights-oriented frameworks establish obligations on the state to protect members of society. This is less replicated in international space law, and even reversed where, in the case of the BOA Principle under Article I of the Outer Space Treaty and within the Space Benefits Declaration seems to place an obligation on non-state actors to benefit the state.

## 6. Conclusion

### 6.1 Moving forward

Frohlich suggest the international space law generally is inadequate to deal with the challenges of market (i.e. non-government) actors becoming increasingly greater drivers of space projects. The solution proposed by Frohlich to this challenge is to enable greater ground-up law-making on the international scene <sup>[20]</sup>. However, the discussion in the present paper suggests the first step before embarking on any such journey is for both non-government and state actors to achieve greater alignment on the meaning of “benefit” and of “all”.

Simpson proposes several avenues for reaching a workable definition of “benefit”, among them include:<sup>[21]</sup>

- a) a multilateral accord which would supplement the Outer Space Treaty or a new bi- or plurilateral agreement
- b) state-to-state benefit and collaborative sharing agreements and
- c) direct funds sharing or training services.

However such analyses do not consider who is “all”? Are we talking about states or (hu)mankind? This paper suggests the first step to satisfying the BOA Principle is to consider these two key terms with their economics definitions:

- a) “benefit” means the value derived from space activities, however closely or remotely related
- b) “all” means any individual or group and does not discriminate by nationality or state and non-state.

### 6.2 Closing remarks

The BOA Principle is an apt representation of why Article I of the Outer Space Treaty is one of the most disputed provision in that instrument. Looking at the principle under the guide of economic implications of how space activities unlock value to society allows the following three simultaneous achievements:

- a) greater standards of living
- b) increased international cooperation and
- c) incentivises the uses of space to be only for peaceful purposes.

Accordingly, not only does a value-focused perspective of the BOA Principle better facilitate benefit to all humankind, but it also better secures the remaining objectives set out in Article I of the Outer Space Treaty. This is despite any active or forced benefits sharing by the actors engaged in space activities. Applying the economic approach to the BOA Principle allows the era of NewSpace to continue growing and for decision makers to facilitate the outcomes of that growth to become value to society. Fortunately, an important first step has already been taken – the economic approach is adopted by UNOOSA.<sup>22</sup>

## References

<sup>1</sup> UN Resolution 1721 (XVI) International Co-operation in the Peaceful Uses of Outer Space, 1961.

<sup>2</sup> UN GA Res 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space.

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- <sup>3</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1967.
- <sup>4</sup> Agreement Governing the Activities of States on the Moon and Other Celestial Bodies 1979.
- <sup>5</sup> GA Res 51/122, Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.
- <sup>6</sup> GA Resolution 1348 (XIII).
- <sup>7</sup> UN Doc A/6341 (31 May 1966) Letter of 30 May 1966 to the UN SG.
- <sup>8</sup> Lai, Albert K, *The Cold War, the Space Race and the Law of Outer space* (Routledge, 2021), 121-122.
- <sup>9</sup> Masson-Zwaan, Tanja and Hoffman, Mahulena, *Introduction to Space Law* (4<sup>th</sup> ed) (Wolters Kluwer, 2019), 17.
- <sup>10</sup> See, e.g., Hobe, Schmidt-Tedd and Schrogl (eds.) *Cologne Commentary on Space Law: Outer Space Treaty* (Wolters Kluwer, 2009), 163-164.
- <sup>11</sup> See e.g., Marcoff, Marco G, “Implementing the Contractual Obligation of Art I, Para I of the Outer Space Treaty 1967” *Proceedings of the Seventeenth Colloquium on the Law of Outer Space* 136 (1974), 137.
- <sup>12</sup> See, e.g., Gorove, S, *Interpretations of International Space Law for Private Enterprise* (ADAS, 1982).
- <sup>13</sup> The Hague International Space Resources Governance Working Group, *Building Blocks for the Development of an International Framework on Space Resource Activities* (2019), para 1.1.
- <sup>14</sup> de O Bittencourt Neto, Olavo et al. (eds), *Building Blocks of an International Framework for the Governance of Space Resource Activities: A Commentary* (Eleven, 2020), 33.
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- <sup>17</sup> See, e.g., .
- <sup>18</sup> See, UNOOSA, *Benefits of Space for Humankind* (2003) < <https://www.unoosa.org/oosa/en/benefits-of-space/benefits.html> >.
- <sup>19</sup> UN GA Res 217 A (III), Universal Declaration of Human Rights, 10 December 1948.
- <sup>20</sup> Froehlich, Annette (ed.), *A Fresh View on the Outer Space Treaty* (Springer 2018), 125.
- <sup>21</sup> Simpson, M, “Benefit in Space Law: Principle and Pathway” *Air & Space Law* 45(2) (2020).
- <sup>22</sup> UNOOSA, *Benefits of Space for Humankind* (2003) < <https://www.unoosa.org/oosa/en/benefits-of-space/benefits.html> >.