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## INCLUSIVE SPACE LAW: THE CONCEPT OF BENEFIT SHARING IN THE OUTER SPACE TREATY

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**Abstract** This article examines the legal principles governing the sharing of benefits deriving from the exploration and use of outer space. It shows that, over time, three strands of State practice have developed different understandings of the content of the obligation contained in Article I, paragraph 1 of the Outer Space Treaty. While drawing parallels with other areas of international law, the article examines the role of equity in the structure of the obligation and evaluates the possibility of replacing considerations of equivalence with a proportionality test to facilitate the fulfilment of the benefit sharing obligation under the Outer Space Treaty.

**Keywords:** public international law, benefit sharing, due diligence, equity, proportionality, obligation of conduct, obligation of result, obligation of means, space resources.

### I. INTRODUCTION

Recent technological developments have increased the prospects of the commercial use of outer space beyond satellite applications, such as space mining and manufacturing in space. Known as the NewSpace economy, the array of potential opportunities increasingly available to the space industry is expected to create a multi-billion market which is already attracting significant public and private investments.<sup>1</sup> At the same time, the possibility of new market forces establishing themselves on a first-come, first-served basis runs the risk of widening the economic gap between the countries possessing financial and technological capabilities to perform space activities and those without. This begs the question of whether international law is equipped to regulate the distribution of the benefits stemming from commercial activities in outer space.

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<sup>1</sup> RC Jacobson, *Space Is Open for Business: The Industry That Can Transform Humanity* (Robert Jacobson 2020); J Gregg, *The Cosmos Economy: The Industrialization of Space* (Springer 2021).

The Outer Space Treaty (1967) is the foundational document regulating the permitted uses of outer space.<sup>2</sup> Ratified by 113 States,<sup>3</sup> it is widely acknowledged to be the constitution for outer space.<sup>4</sup> Article I, paragraph 1 states that '[t]he 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'. Drafted at the height of the Cold War, the Outer Space Treaty establishes guiding principles for the peaceful uses of outer space without concerning itself with specific types of space activities, whether scientific or commercial in nature. In this respect, it has a comprehensive scope.

However, the provisions of Article I, paragraph 1 lack an implementing mechanism. As a result, States and scholars alike hold different views about the content and scope of the obligation to share benefits deriving from the exploration and use of outer space. In practice, States have largely overlooked the obligation of benefit sharing, leading scholars to conclude it is only a moral, as opposed to a legal, obligation.<sup>5</sup> In the absence of an implementing mechanism, can the requirement of benefit sharing as set out in the Outer Space Treaty be implemented by the actors (public or private) engaging in commercial space activities and subsequently enforced by a court of law?

Scholarly positions on the extent to which the benefit sharing obligation applies to commercial space activities can be grouped into three streams. The first requires States to perform space activities that are not detrimental to other States without necessarily sharing the benefits deriving from their space activities (a negative conception of benefit sharing).<sup>6</sup> Effectively, it embeds the logic underpinning the claim to exclusive rights under the freedoms of the high seas prior to the adoption of the Declaration of Principles Governing the Seabed

<sup>2</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (signed 27 January 1967, entered into force 10 October 1967) 610 UNTS 205 (Outer Space Treaty).

<sup>3</sup> Committee on the Peaceful Uses of Outer Space (COPUOS), Legal Subcommittee, 'Status of International Agreements relating to activities in outer space as at 1 January 2023' (20 March 2023) UN Doc A/AC.105/C.2/2023/CRP.3 (listing 112 ratifications as of 1 January 2023); Croatia acceded on 10 March 2023—see US Department of State Depository Notification, Notification Reference No. 2023-004.

<sup>4</sup> See, among many, H Qizhi, 'The Outer Space Treaty in Perspective' (1997) 25(2) *JSpaceL* 93 (describing the Outer Space Treaty as the Magna Carta of international space law embodying several rules of customary international law).

<sup>5</sup> N Jasentuliyana, 'Article I of the Outer Space Treaty Revisited' (1989) 17(2) *JSpaceL* 129, 130 (arguing that the benefit sharing obligation under Article I of the Outer Space Treaty cannot be enforced, as it constitutes 'more a moral and philosophical obligation than a legal requirement'); S Gorove, 'Implications of International Space Law for Private Enterprise' (1982) 7 *Ann Air & Space L* 319.

<sup>6</sup> SE Doyle, 'Using Extraterrestrial Resources under the Moon Agreement of 1979' (1998) 26 (2) *JSpaceL* 111, 114 (stating that Article I, paragraph 1 of the Outer Space Treaty does not require a spacefaring State to 'share all benefits of its use [of outer space] with all other states').

in 1970.<sup>7</sup> The second requires States to perform space activities that benefit all States simultaneously, irrespective of the degree of actual benefit generated for individual States (a positive conception of benefit sharing).<sup>8</sup> It posits that, as an area beyond State jurisdiction like the oceans, outer space possesses the status of common property.<sup>9</sup> The third requires States to perform space activities that substantively, and not merely formally or nominally, benefit all States (a distributive conception of sharing).<sup>10</sup> This takes into consideration the capability of the recipient State to benefit effectively from the space activity performed. In other words, it entails equitable sharing considerations.

These streams of thought tend to provide rigid interpretations of the content and scope of the benefit sharing obligation through selective comparisons with the law regulating other global commons, in particular the law of the sea.<sup>11</sup> As a result, they present benefit sharing as a unitary concept which applies indiscriminately across various fields of international law. This article takes a different methodological approach to the problem of implementation (and possible enforcement) of the benefit sharing obligation in the context of commercial space activities. First, it reconstructs the web of provisions under international space law referring to the concept of benefit sharing in order to identify the extent to which they supplement or depart from the text of the Outer Space Treaty. In doing so, it identifies underlying legal concepts informing the obligation of benefit sharing, such as the legal status of outer space and its resources.

Secondly, the article examines how subsequent State practice has imparted different shades of meaning to Article I, paragraph 1 of the Outer Space Treaty with a view to conceptualizing the structure of the obligation and identifying the ultimate goals that States seek to achieve through benefit sharing, such as ensuring equitable access to outer space for all States. In doing so, it provides an empirically grounded analysis based on extensive

<sup>7</sup> For a detailed overview, see ED Brown, 'Freedom of the High Seas Versus the Common Heritage of Mankind: Fundamental Principles in Conflict' (1983) 20(3) *SanDiegoLRev* 521.

<sup>8</sup> Jasentuliyana (n 5) 139 (arguing that the benefits of space activities 'shall accrue to all countries'); AA Cocca, 'Solidarity and Humanism in the Outer Space Treaty' (1997) 40 *ProcColloqLOuterSpace* 68, 69 (arguing that all activities conducted in outer space 'must achieve the benefit for all [hu]mankind').

<sup>9</sup> AA Cocca, 'Property Rights on the Moon and Celestial Bodies' (1996) 39 *ProcColloqLOuterSpace* 9, 17 ('Humankind is the owner of the whole of the Moon and celestial bodies and outer space').

<sup>10</sup> V Vereshchetin and E Kamenetskaya, 'On the Way to a World Space Organization' (1987) 12 *AnnAir&SpaceL* 337, 340 (calling for space exploration 'which is accessible to all, provides tangible benefits to all people and is practiced without any discrimination'); T Aganaba-Jeanty, 'Common Benefit from a Perspective of "Non-Traditional Partners": A Proposed Agenda to Address the Status Quo in Global Space Governance' (2015) 117 *Acta Astronaut* 172 (arguing that benefit sharing entails reciprocal obligations).

<sup>11</sup> See eg F Xu and J Su, 'Towards a Legal Regime of Benefits Sharing for Space Mining: with Some Experience from the Area' (2022) 76 *ResourcesPol* 1, 7–9 (arguing that the conceptualization of benefit sharing in context of space mining activities could benefit from consideration of the parallel regime for deep seabed mining under UNCLOS).

archival research. The documents consulted include the annual reports adopted by both the United Nations (UN) Committee on the Peaceful Uses of Outer Space (COPUOS) and its Legal Subcommittee as well as the official statements made by delegations since 1986, the year in which a group of delegations proposed the inclusion of benefit sharing on the agenda of the Legal Subcommittee.<sup>12</sup> The empirical investigation also identifies the specific actions envisioned by States to achieve the set goals, such as the role of international cooperation in the implementation of the benefit sharing obligation.

Thirdly, taking stock of the analysis on subsequent State practice, the article elaborates an implementing mechanism for the benefit sharing provision in the Outer Space Treaty—namely, an original proportionality test. Given that States remain responsible for the activities in outer space carried out by private entities under their jurisdiction,<sup>13</sup> the design of the proportionality test enables any space actor (whether public or private) to apply it to their commercial activities, thus embedding an inclusive conception of benefit sharing under international space law. A unique aspect of the proportionality test is that its component elements have been identified and developed through the technique of extrapolation instead of analogy with the global commons.<sup>14</sup>

By bringing together legal concepts and principles found in documents regulating areas of international law other than space law, extrapolation is instrumental to the elaboration of a normative standard aimed at facilitating the implementation (and potential enforcement) of the benefit sharing obligation under the Outer Space Treaty. For the purposes of this article, the process of extrapolation focuses predominantly on three areas regulating the equitable use of shared resources—namely, the law of non-navigational uses of international watercourses, the law of transboundary aquifers and the international protection of the atmosphere—the main reason being that they focus on the use of non-living resources, like those involved in commercial space activities.

A recognized advantage of extrapolation is that it allows gaps in the law to be filled by building on existing standards rather than inventing new ones which may lack legitimacy.<sup>15</sup> A limitation is that it assumes universal agreement on

<sup>12</sup> COPUOS, UN Doc A/AC.105/SR.282 (statement by Venezuela). Of the 77 documents consulted, seven were available on the UN Official Document System, 26 have been digitized by the UN Library upon request of this author and 44 have been consulted in hard copy or fiche at two UN depository libraries.

<sup>13</sup> Outer Space Treaty (n 2) art VI: ‘States Parties to the Treaty shall bear international responsibility for national activities in outer space, including [those conducted] by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty’.

<sup>14</sup> S Sivakumaran, ‘Techniques in International Law-Making: Extrapolation, Analogy, Form and the Emergence of an International Law of Disaster Relief’ (2017) 28(4) EJIL 1097 (elaborating on extrapolation as a methodology of research with its own features).

<sup>15</sup> *ibid* 1113.

the selected concepts and principles. As Sivakumaran writes, '[u]ltimately, the "generalized standard" approach packages things neatly and presents a coherent picture when, in reality, the law is rather messy'.<sup>16</sup> In order to mitigate this, the concepts and principles used to drive the process of extrapolation are those which are also supported by State practice on benefit sharing and international case law.

The proportionality test aims to facilitate the determination of the appropriate amount of benefit sharing due to the international community by both public and private actors on a case-by-case basis. In doing so, the article advances the scholarly literature on the obligation of benefit sharing under international law in general, and international space law in particular. The findings are also useful for wider audiences, since they provide practical guidance to States and other interested space actors on how to conduct their commercial activities in compliance with Article I, paragraph 1, of the Outer Space Treaty. Equally, they enrich the legal background informing the current work of the COPUOS Working Group on the Legal Aspects of Space Resource Activities, where discussions about the scope and content of the benefit sharing obligation under the Outer Space Treaty feature prominently.<sup>17</sup>

The article is divided into five sections. Section II provides an overview of the sources of benefit sharing under international space law and evaluates the foundational role of the Outer Space Treaty. Section III conceptualizes the structure of the benefit sharing obligation under the Outer Space Treaty. It shows that, over time, State practice has imparted three different meanings to the obligation, thus demonstrating that the concept of benefit sharing under international space law is not static. At the same time, the findings indicate that State practice converges in recognizing that benefit sharing must be equitable. Section IV evaluates the role of equity in the structure of the benefit sharing obligation. While considering the equitable sharing requirements developed in context of other areas of international law, it shows that equitable considerations under the Outer Space Treaty remain necessarily vague and, ultimately, devoid of practical applications. Consequently, Section V proposes to replace considerations of equivalence with a more structured proportionality test and assesses the wider implications of introducing the concept of proportionality for both the progressive development of international space law and other fields of international law. Section VI offers some concluding remarks.

<sup>16</sup> *ibid* 1114.

<sup>17</sup> Established in April 2022 with a mandate to formulate a set of guiding principles and practical recommendations for States engaging (or planning to engage) in such activities. The latter will form the text of a draft resolution to be submitted to the UNGA for consideration and possible adoption in 2027.

## II. SOURCES OF INTERNATIONAL SPACE LAW ON BENEFIT SHARING: AN OVERVIEW

International space law is a specialized field of international law possessing special characteristics relating to aspects of the lawmaking process.<sup>18</sup> Currently consisting of five multilateral treaties<sup>19</sup> and five sets of guiding principles,<sup>20</sup> the *corpus juris spatialis* has been created by and evolves through the method of consensus.<sup>21</sup> This involves ‘adopting a text without a vote in the absence of formal and substantive objections’ by the States participating in the COPUOS deliberations.<sup>22</sup> As a result, international space law is particularly sensitive to political and diplomatic interactions requiring the active participation of spacefaring nations in the formation, implementation and enforcement of any norms aimed at regulating activities in outer space.

The special traits of international space law have a bearing on the number and type of sources addressing the concept of benefit sharing. This section examines the relationship between Article I, paragraph 1 of the Outer Space Treaty and other sources of international space law referring to the principle of benefit sharing with a view to establishing the extent to which they converge on core elements or depart from the seminal conception contained in the Treaty. In doing so, the analysis identifies the normative premises informing the concept of benefit sharing in treaty law (Section A) and soft law (Section B). Given the limited number of States possessing space technology and domestic legislation regulating space activities, customary international law

<sup>18</sup> P Malanczuk, ‘Space Law as a Branch of International Law’ (1994) 25 NYIL 143.

<sup>19</sup> Outer Space Treaty (n 2); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (adopted 19 December 1967, entered into force 3 December 1968) 672 UNTS 119; Convention on International Liability for Damage Caused by Space Objects (adopted 29 November 1971, entered into force 1 September 1972) 961 UNTS 187; Convention on Registration of Objects Launched into Outer Space (adopted 12 November 1974, entered into force 15 September 1976) 1023 UNTS 15; Agreement governing the Activities of States on the Moon and Other Celestial Bodies (adopted 5 December 1979, entered into force 11 July 1984) 1363 UNTS 3 (Moon Agreement).

<sup>20</sup> UNGA, ‘Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space’ (13 December 1963) UN Doc A/RES/1962(XVIII); UNGA Res 37/92 (10 December 1982) UN Doc A/RES/37/92; UNGA, ‘Principles Relating to Remote Sensing of the Earth from Outer Space’ (3 December 1986) UN Doc A/RES/41/65; UNGA, ‘Principles Relevant to the Use of Nuclear Power Sources in Outer Space’ (14 December 1992) UN Doc A/RES/47/68; and UNGA, ‘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’ (13 December 1996) UN Doc A/RES/51/122 (Declaration on International Cooperation).

<sup>21</sup> GM Danilenko, ‘Outer Space and the Multilateral Treaty-Making Process’ (1990) 4 HighTechLJ 217, 223 (describing consensus as ‘a major procedural principle governing space rule-making negotiations’).

<sup>22</sup> Malanczuk (n 18) 154–5. See also E Galloway, ‘Consensus Decisionmaking by the United Nations Committee on the Peaceful Uses of Outer Space’ (1979) 7 JSpaceL 3 (distinguishing between consensus as non-objection to a decision and unanimous voting); GM Danilenko, ‘International Law-Making for Outer Space’ (2016) 37 SpacePol 179, 180 (arguing that often resort to consensus ‘serves only as a disguise for continued disagreement’).

and general principles of law have not significantly contributed to the development of the principle of benefit sharing in the context of space activities.<sup>23</sup> Equally, national and international case law has not played a central role in the development of international space law.<sup>24</sup>

### A. Treaty Law

Two multilateral treaties—the Outer Space Treaty and the Moon Agreement—explicitly require States to share the benefits generated by space activities. This section examines the provisions detailing the obligation of benefit sharing within the two treaties in order to identify the underlying legal concepts informing that obligation. In doing so, it also provides a comparative assessment of the main characteristics of the benefit sharing regimes contained in other multilateral treaties governing areas beyond national jurisdiction and their resources.

#### 1. Outer Space Treaty

Article I, paragraph 1 is the only provision of the Outer Space Treaty which deals with the obligation of benefit sharing. It laconically establishes that the exploration and use of outer space must be carried out for the benefit and in the interests of all States, thus raising interpretative difficulties as to the delimitation of its content and scope.

On the one hand, scholars unanimously acknowledge that the text lacks clarity, as it does not define the key terms ‘benefit’ and ‘interests’.<sup>25</sup> Also, it does not specify how all States will benefit from space activities. The negotiating history of the provision does not provide much interpretative guidance either, as its predecessor—Article 1 of the 1963 Soviet Union’s

<sup>23</sup> Malanczuk (n 18) 159; FG von der Dunk, ‘Customary International Law and Outer Space’ in BD Lepard, *Reexamining Customary International Law* (CUP 2017) 346, 349. Writing before the adoption of the Outer Space Treaty, Cheng wrote that not even the 1963 Declaration of Legal Principles (n 20) can be considered as declaratory of customary international law on outer space. See B Cheng, ‘United Nations Resolutions on Outer Space: “Instant” International Customary Law?’ (1965) 5 *IJIL* 23. For a different assessment postdating the adoption of the Outer Space Treaty, see VS Vereshchetin and GM Danilenko, ‘Custom as a Source of International Law of Outer Space’ (1985) 13 *JSpaceL* 22, 25 (arguing that certain provisions of the Outer Space Treaty formalize rules of customary international law, such as Articles I and II—recognizing that outer space is free for exploration and use by all States and not subject to national appropriation—and Article VIII, establishing that States retain jurisdiction and control over space objects launched into outer space).

<sup>24</sup> Malanczuk (n 18) 163; R Deplano, ‘The Peaceful Settlement of Space Disputes: Prospects and Challenges’ in R Buchan, D Franchini and N Tsagourias, *The Changing Character of International Dispute Settlement: Challenges and Prospects* (CUP 2023, forthcoming) Ch 15.

<sup>25</sup> S Hobe, ‘Article I’ in S Hobe, B Schmidt-Tedd and K Schrogl (eds), *Cologne Commentary on Space Law* (Verlag 2009) 25, 40, para 57 (arguing that Article I, paragraph 1, of the Outer Space Treaty lacks clarity regarding the concrete modalities for identifying the appropriate amount of sharing).

draft treaty—simply states that the exploration and use of outer space ‘shall be carried out for the benefit and in the interests of the whole of mankind’.<sup>26</sup> At the same time, individual statements by delegations during the treaty negotiations indicate that it was intended to cover the sharing of scientific data and research findings.<sup>27</sup>

On the other hand, the obligation of benefit sharing sits in context of a more general provision concerning the lawful exploration and use of outer space. The full text of Article I, paragraph 1 of the Outer Space Treaty reads:

The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic and scientific development, and shall be the province of all mankind.

This has led some scholars to conclude that it introduces a principle of far-reaching significance subordinating all space activities to the requirement of benefit sharing in the interest of all States.<sup>28</sup>

Placed in its wider normative context, the obligation of benefit sharing indicates that outer space is an inclusive environment—that is to say, an area that everyone can use on equal terms (‘the province of all mankind’), provided that the activities carried out benefit the international community of States.<sup>29</sup> In doing so, it rejects the idea that outer space is *terra nullius*. Article II confirms this interpretation by declaring that outer space is not subject to national appropriation. This shows that the underlying legal principle governing the obligation of benefit sharing under the Outer Space Treaty is that outer space is a *res extra commercium*.<sup>30</sup> In other words, it is an area available for everyone to use without being the property of anyone (whether individual States or the international community as a whole). It follows that spacefaring States are under no obligation to compensate the international community for the use of a communal property. They are only required to treat outer space as an inclusive environment to be used for the benefit of all States.

<sup>26</sup> COPUOS (16 April 1963) UN Doc A/AC.105/C.2/L.6.

<sup>27</sup> COPUOS (27 July 1966) UN Doc A/AC.105/C.2/SR.65, 4—statement by Hungary (referring to the requirement of ‘publication of information’ by spacefaring States); COPUOS (4 August 1966) UN Doc A/AC.105/C.2/SR.71/Add.1, 23—statement by Bulgaria (pointing out that ‘the results achieved through space exploration and research [must] benefit all mankind, not merely certain States or groups of States’).

<sup>28</sup> B Cheng, *Studies in International Space Law* (Clarendon Press 1997) 234 (‘such exploration and use are permissible only to the extent to which they are “for the benefit and in the interests of all countries”’).

<sup>29</sup> Hobe (n 25) 41, para 60 (describing the exploration and use of outer space as ‘a community effort’ aimed at enabling the states without space technology to profit from the benefits of space activities conducted by others).

<sup>30</sup> *ibid* 229–30; P De Man, *Exclusive Use in an Inclusive Environment: The Meaning of the Non-Appropriation Principle for Space Resource Utilization* (Springer 2016) 18–33. See also M Lachs, *The Law of Outer Space: An Experience in Contemporary Lawmaking* (Nijhoff 2010) 46 (clarifying that outer space is an environment—‘a sphere of space activities’—not a *res*).



Compared to other multilateral treaties, Article I, paragraph 1 is a progressive provision. Neither the Antarctic Treaty (1959)<sup>31</sup> nor the Wellington Convention (1988)<sup>32</sup> address the issue of benefit sharing in relation to activities taking place in the Antarctic region when qualifying Antarctica as an area not subject to national appropriation.<sup>33</sup> However, when compared to both the UN Convention on the Law of the Sea (UNCLOS, 1982)<sup>34</sup> and the Draft Agreement on Marine Biological Diversity of Areas beyond National Jurisdiction (2023),<sup>35</sup> the Outer Space Treaty lacks a mechanism for benefit sharing creating institutions endowed with specific decision making, management and review powers.<sup>36</sup> The main reason for this divergence is that, unlike the Outer Space Treaty, both UNCLOS and the Draft Agreement on Marine Biological Resources conceive of the oceans and the deep seabed as being common property of the international community.<sup>37</sup>

## 2. Moon Agreement

The Moon Agreement (1979) contains two provisions articulating the benefit sharing obligation. Article 4(1) mirrors the text of Article I, paragraph 1 of the Outer Space Treaty. It reads: ‘The exploration and use of the Moon shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development.’ However, Article 11(5) states that the parties to the Moon Agreement ‘undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible’. Paragraph 7(d) then clarifies that one of the main purposes of the international regime is to enable:

An equitable sharing by all States Parties [to the Moon Agreement] 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.

<sup>31</sup> Antarctic Treaty (adopted 1 December 1959, entered into force 23 June 1961) 402 UNTS 71.

<sup>32</sup> Convention on the Regulation of Antarctic Mineral Resource Activities (signed 25 November 1988, not in force) 27 ILM 868 (also known as the Wellington Convention).

<sup>33</sup> Antarctic Treaty (n 31) art IV.2; Wellington Convention *ibid*, art 37, para 1 (establishing that prospecting ‘shall not confer upon any operator any right to Antarctic mineral resources’).

<sup>34</sup> United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 397.

<sup>35</sup> UNGA, Draft Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (4 March 2023) <[www.un.org/bbnj/sites/www.un.org/bbnj/files/draft\\_agreement\\_advanced\\_unedited\\_for\\_posting\\_v1.pdf](http://www.un.org/bbnj/sites/www.un.org/bbnj/files/draft_agreement_advanced_unedited_for_posting_v1.pdf)>.

<sup>36</sup> UNCLOS (n 34) Part XI; Draft Agreement *ibid*, Part II, especially arts 11, 11bis.

<sup>37</sup> UNCLOS *ibid*, art 136; Draft Agreement *ibid*, art 5(b).

The combined provision on benefit sharing in Articles 11(5) and 11(7)(d) departs from Article I, paragraph 1 of the Outer Space Treaty in two ways. First, they restrict the applicability of the benefit sharing regime to the parties of the Moon Agreement whereas the Outer Space Treaty refers to benefits for the international community. Secondly, they add conditions for sharing—namely, giving special consideration to the interests and needs of developing countries, as well as the efforts of States utilizing the Moon's resources—thus enriching the obligation in the Outer Space Treaty. In order to support this double departure from the Outer Space Treaty, Article 11(1) states that the Moon and its natural resources are the common heritage of mankind.

While its specific meaning is to be established by the international regime foreseen in Article 11(5),<sup>38</sup> this reference to the common heritage of mankind suggests that the Moon and the other celestial bodies within the Solar System<sup>39</sup> are the common property of the international community. As a result, the Moon Agreement does not envision outer space as an inclusive environment as does the Outer Space Treaty. Rather, it envisions the creation of a dedicated system for resource management and redistribution of benefits based on needs of the recipient States. In this respect, the Moon Agreement envisions a benefit sharing system largely compliant with UNCLOS and the Draft Treaty on Marine Biological Diversity. For instance, Article 137(2) of UNCLOS establishes the International Seabed Authority (ISA) as the institution competent for managing the resources of the Area (that is to say, the oceans and the deep seabed) on behalf of humankind as a whole, the latter being the holder of all rights in the resources of the Area. Similarly, Article 48 of the Draft Treaty on Marine Biological Diversity establishes a Conference of the Parties which has the power to adopt decisions concerning the implementation of the treaty in general and, in consultation with the Access and Benefit Sharing Committee established by Article 11bis, the implementation of provisions concerning the sharing of monetary benefits in particular.

Given its reliance on the contested concept of the common heritage of mankind,<sup>40</sup> the Moon Agreement has never garnered full support among States. As Cheng writes, its rushed adoption at COPUOS after years of stalemate had been possible only as a result of intense, informal consultations on the compromise formula contained in Article 11. The latter declares the Moon and its resources to be the common heritage of mankind while

<sup>38</sup> Moon Agreement (n 19) art 11, para 1 (stating that the common heritage of mankind 'finds its expression in the provisions of this Agreement, in particular paragraph 5 of this article').

<sup>39</sup> *ibid*, art 1, para 1 (stating that the provisions of the Moon Agreement apply to the Moon as well as 'other celestial bodies within the solar system, other than the Earth, insofar as specific legal norms enter into force with respect to any of these celestial bodies').

<sup>40</sup> Vereshchetin and Danilenko (n 23) 33–4 (pointing out lack of State practice in relation to Article 11, paragraph 5, of the Moon Agreement); C Joyner, 'Legal Implications of the Common Heritage of Mankind' (1986) 35 ICLQ 190 (arguing that the common heritage of mankind is not customary international law).

reserving the establishment of an international regime for resource exploitation to a future treaty.<sup>41</sup> Such an agreement has never been negotiated and the Moon Agreement has turned out to be the least successful of the space treaties concluded under the aegis of the UN, having been ratified by only 17 States, none of them a major spacefaring State. Equally, developing countries have not widely ratified it, thus signalling an overall lack of support for its normative underpinnings (which also inform the benefit sharing obligation).

### B. Soft Law

The *corpus juris spatialis* includes a set of principles addressing the role of international cooperation in generating shared benefits: the Declaration on International Cooperation.<sup>42</sup> Paragraph 1 states that:

International cooperation in the exploration and use of outer space for peaceful purposes ... shall be carried out for the benefit and in the interests of all States, irrespective of their degree of economic, social or scientific and technical development, and shall be the province of all mankind. Particular account should be taken of the needs of developing countries.

As this suggests, the Declaration on International Cooperation builds on two provisions of Article I of the Outer Space Treaty—namely, paragraph 3 (requiring States to facilitate and encourage international cooperation in the scientific investigation of outer space), to be read in combination with the provision on benefit sharing contained in paragraph 1.<sup>43</sup> At the same time, it supplements the text of the Outer Space Treaty by requiring spacefaring States to take into account the needs of developing countries—a requirement which paragraph 3 of the Declaration extends to States with incipient space programmes stemming from international cooperation negotiated ‘on an equitable and mutually acceptable basis’. This largely mirrors the provisions of Article 11(7)(d), of the Moon Agreement and other multilateral treaties governing activities in areas beyond national jurisdiction<sup>44</sup> while at the same time refrains from declaring outer space to be the collective property of the international community.

As a resolution adopted by the UN General Assembly (UNGA), the Declaration on International Cooperation is not legally binding.<sup>45</sup> Nor does its adoption amount per se to an amendment of the Outer Space Treaty in the absence of either a subsequent agreement or subsequent practice among the

<sup>41</sup> Cheng (n 28) 357, 361–2 (describing the text of the Moon Agreement as hastily and poorly put together in the span of two weeks through informal negotiations of which there is no official record).

<sup>42</sup> Declaration on International Cooperation (n 20).

<sup>43</sup> See also *ibid*, Preamble, paras 8 (quotation) and 9 (quotation).

<sup>44</sup> UNCLOS (n 34) art 140; Draft Agreement (n 35) art 5(l–m). See also Wellington Convention (n 32) Preamble, para 12.

<sup>45</sup> Charter of the United Nations (adopted 26 June 1945, entered into force 24 October 1945) 1 UNTS XVI, arts 10–14 (describing GA resolutions as recommendations).

parties concerning the interpretation of Article I.<sup>46</sup> The negotiating history of the Declaration does not provide evidence of an intention by the UN member states to consensually agree on a specific interpretation of Article I. However, some scholars describe the Declaration on International Cooperation as a defining moment in the development of international space law<sup>47</sup> and as providing an authoritative interpretation of the principle of international cooperation set out in Article I of the Outer Space Treaty.<sup>48</sup>

This appears to be rooted in a misconception of the meaning of consensus in the context of the UNGA's lawmaking process. For instance, Thaker argues that 'there is no doubt that [the Declaration on International Cooperation's] unanimous adoption by the Assembly gives the resolution considerable weight with regard to its binding effect'.<sup>49</sup> However, consensus entails the adoption of a resolution without a vote<sup>50</sup> rather than by unanimity. Also, it does not indicate genuine commitment to abide by the resolution.<sup>51</sup> As a result, it is not possible to draw from the simple adoption by consensus of a resolution an authoritative interpretation of Article I.<sup>52</sup> The Declaration on International Cooperation does not challenge the conceptual underpinnings of the Outer Space Treaty qualifying outer space as an inclusive environment.<sup>53</sup>

### III. CONCEPTUALIZING THE STRUCTURE OF THE OBLIGATION

Article 32 of the Vienna Convention on the Law of Treaties (VCLT, 1969) states that, where the meaning of a treaty provision remains ambiguous or obscure, recourse may be had to supplementary means of interpretation. The

<sup>46</sup> As required by the Vienna Convention on the Law of Treaties (signed 23 May 1969, entered into force 27 January 1980) 1155 UNTS 331, art 31, para 3(a–b).

<sup>47</sup> JS Thaker, 'The Development of the Outer Space Benefits Declaration' (1997) 22 *AnnAir&SpaceL* 537, 538 (referring to the Declaration as 'another important contribution to the progressive development of international space law'). See also M Benkő and K Schrogl, 'The UN Committee on the Peaceful Uses of Outer Space: Adoption of a Declaration on "Space Benefits" and Other Recent Developments' (1997) 46 *GermJAir&SpaceL* 228, 232 (predicting that the adoption of the declaration would also produce political impacts, such as the reduction of ideological debates on the structure of the international order within COPUOS).

<sup>48</sup> Benkő and Schrogl *ibid* 233; M Benkő and K Schrogl, 'History and Impact of the 1996 UN Declaration on "Space Benefits"' (1997) 13 *SpacePol* 139, 143; M Benkő and K Schrogl, 'The UN Committee on the Peaceful Uses of Outer Space: Progress on "Space Benefits" and Other Recent Developments' (1995) 44 *GermJAir&SpaceL* 291, 292.

<sup>49</sup> Thaker (n 47) 555.

<sup>50</sup> R Deplano, *Empirical and Theoretical Approaches to International Law: How States Use the UN General Assembly to Create International Obligations* (CUP 2022) 37–41.

<sup>51</sup> For an analysis of the phenomenon of 'false positives' and 'false negatives' at the UNGA, see *ibid* 83–94, 174.

<sup>52</sup> See also M Benkő and K Schrogl, "'Space Benefits" – Towards a Useful Framework for International Cooperation' (1995) 11(1) *SpacePol* 5, 5–6 (pointing out that the negotiating history of the Declaration of International Cooperation is characterized by ideological confrontation between developed and developing countries).

<sup>53</sup> As discussed in Section II.A.

latter include any subsequent practice in the application of a treaty.<sup>54</sup> Since the specific contours of the obligation of benefit sharing in the Outer Space Treaty remain unclear, and in the absence of an implementing mechanism, subsequent practice can shed light on its meaning, including the structure of the obligation.<sup>55</sup>

At COPUOS, delegations have advanced three different claims concerning the content of the obligation of benefit sharing contained in the Outer Space Treaty. Since the decision making process at COPUOS is governed by the rule of consensus,<sup>56</sup> each has emerged as an alternative to another. As a result, they are largely mutually exclusive, each entailing a different structure of the benefit sharing obligation. The following subsections examine, in turn (and in chronological order), the content of each claim, evaluate the extent to which they are supported by State practice outside COPUOS and identify potential areas of convergence.

#### *A. Access to the Means for Space Activities*

Emerging in the mid-1980s, the first claim about the content of the benefit sharing obligation maintains that all States have an equal right to benefit from the exploration and use of outer space. Given the different levels of space capabilities among States,<sup>57</sup> this requires that all States have access to the means for conducting space activities, with a view to financially benefitting from their own commercial operations (as opposed to benefitting from the space activities of others).<sup>58</sup> Hence, States with space capabilities have a special responsibility to help develop the capacities of others<sup>59</sup> through

<sup>54</sup> UNGA, 'Subsequent agreements and subsequent practice in relation to the interpretation of treaties' (3 January 2019) UN Doc A/RES/73/202, Annex, Conclusion 4(3) (defining subsequent practice as a supplementary means of interpretation under Article 32 of the Vienna Convention on the Law of Treaties as 'conduct by one or more parties in the application of the treaty, after its conclusion'). <sup>55</sup> Hobe (n 25) 38, para 51 and 41, para 60. <sup>56</sup> As discussed in Section II.

<sup>57</sup> COPUOS, 'Report of the Committee on the Peaceful Uses of Outer Space' (22 August 1989) UN Doc A/AC.105/430, 10, para 43 (stating that the technological gap between developed and developing countries produced barriers in terms of access to space science and technology, 'which in turn resulted in the benefits arising from the use and exploration of outer space accruing primarily to a small group of countries'); COPUOS, 'Report of the Scientific and Technical Sub-Committee on the Work of its 29th Session' (20 April 1992) UN Doc A/AC.105/514, 36, para 25.

<sup>58</sup> COPUOS, 'Report of the Legal Sub-Committee (of the Committee on the Peaceful Uses of Outer Space)' (5 May 1986) UN Doc A/AC.105/370, 7, para 14 (pointing out the need for States lacking space technology 'to have access to such commercialization' in order to be 'able to participate in the benefits derived therefrom').

<sup>59</sup> COPUOS, 'Report of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space' (16 March to 3 April 1987) UN Doc A/AC.105/385, 60, para 5(c) (grounding the demand on the duty to respect 'the interests of all peoples to accede to higher standards of living' set forth in arts 55–56 of the UN Charter); COPUOS, UN Doc A/AC.105/514 (n 57) 34, para 17 (arguing that States with space capabilities 'ha[ve] the ability to promote and foster cooperation in outer space science and technology').

international cooperation.<sup>60</sup> This, in turn, involves three requirements: mandatory cooperation with developing countries;<sup>61</sup> transfer of know-how and space technology;<sup>62</sup> and the equitable sharing of benefits deriving from space activities.<sup>63</sup>

Effectively, this claim makes international cooperation an integral part—if not the object in itself—of the obligation of benefit sharing. In addition, by imposing strict requirements on the conduct of collaborative space activities, this approach reflects what Ago termed an obligation of means. Originally included in Draft Article 20 of the International Law Commission (ILC) Articles on Responsibility of States for Internationally Wrongful Acts (ARSIWA), the obligation of means is ‘an international obligation specifically calling for [a State] to adopt a particular course of conduct’ whose breach occurs ‘simply by virtue of the adoption of a course of conduct different from [the one] specifically required’.<sup>64</sup> However, Article I, paragraph 1, of the Outer Space Treaty does not refer to international cooperation. As a result, conceptualizing the benefit sharing obligation as one of means centred on international cooperation is problematic in at least three respects.

First, by prescribing specific forms of conduct, it deprives States of any degree of discretion in the interpretation of and compliance with the treaty provision. As Dupuy writes, Ago’s formulation of the obligation of means is ‘distinctly contrary’ to the general understanding of an obligation of due diligence.<sup>65</sup> The latter is an obligation to strive to attain a given result but without constraints as to the means employed<sup>66</sup> whereas obligation of means

<sup>60</sup> See, for instance, COPUOS, UN Doc A/AC.105/385 *ibid* 59, para 5; COPUOS, UN Doc A/AC.105/430 (n 57) 11, para 43; and COPUOS, ‘Report of the Committee on the Peaceful Uses of Outer Space’ (22 June 1989) UN Doc A/44/20, 17, para 110.

<sup>61</sup> COPUOS, UN Doc A/AC.105/514 (n 57) 33, para 13 (the concept of international cooperation ‘contain[s] certain obligatory elements’).

<sup>62</sup> See, for instance, COPUOS, ‘Committee on the Uses of Outer Space: Report of the Legal Subcommittee on the work of its Twenty-ninth Session’ (2 May 1990) UN Doc A/AC.105/457, 13, paras 56–57; COPUOS, ‘Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on the work of its Thirtieth Session’ (17 April 1991) UN Doc A/AC.105/484, Annex III, 47, Principles II(1–2) and VI(3)(b, e); COPUOS, ‘Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on the work of its Thirty-second Session’ (15 April 1993) UN Doc A/AC.105/544, 28, para 34.

<sup>63</sup> COPUOS, UN Doc A/AC.105/430 (n 57) 11, para 43 (grounding the demand on the tenets of the New International Economic Order); COPUOS, UN Doc A/AC.105/514 (n 57) 37, para 27 (arguing that equity should be attained through special treatment for developing countries).

<sup>64</sup> ILC, Draft Article 20: Breach of an International Obligation Calling for the State to Adopt a Specific Course of Conduct, UNYBILC, vol II (1977) Part One, 8.

<sup>65</sup> P Dupuy, ‘Reviewing the Difficulties of Codification: On Ago’s Classification of Obligations of Means and Obligations of Result’ (1999) 10 EJIL 371, 376.

<sup>66</sup> J Combacau and D Alland, ‘“Primary” and “Secondary” Rules in the Law of State Responsibility: Categorizing International Obligations’ (1985) 16 NYIL 81; Dupuy *ibid* 375. See also ILC, ‘Second Report on State Responsibility’ (17 March 1999) UN Doc A/CN.4/498, para 57; and T Koivurova, ‘Due Diligence’ in *Max Planck Encyclopedia of Public International Law* (OUP 2010) para 29—both describing obligations of conduct as best-efforts obligations.

reduces the options available to State conduct to that which is prescribed. It thus conflates the concept of due diligence in the implementation of a treaty provision with the requirements of more specific legal obligations.<sup>67</sup>

For all practical purposes, making certain forms of international cooperation an end in itself turns the benefit sharing obligation into an obligation to facilitate access to the means of conducting space activities, rather than sharing the benefits derived from the exploration and use of outer space. Obligations combining required forms of conduct with goals to be achieved are not unusual. For example, Article 194(2), UNCLOS<sup>68</sup> requires States to 'take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment'. However, in such cases the treaty provision leaves States a degree of flexibility in choosing how to fulfil the obligation. Conversely, the access to the means claim results in a rigid interpretation of Article I, paragraph 1 of the Outer Space Treaty which is not justified by the letter of the treaty.<sup>69</sup> In the light of Article 31(1) VCLT, States must interpret treaty provisions according to the ordinary meaning of the terms used.

Secondly, by requiring a specific course of conduct, the moment at which the breach of the obligation of means occurs is predetermined.<sup>70</sup> As a result, determining State responsibility turns out to be a formalistic exercise instead of an assessment of actual State conduct in the light of the context and circumstances surrounding it.<sup>71</sup> When applied to the benefit sharing obligation, it suggests that the responsibility of a State arises the moment it undertakes space activities which do not also involve other States which lack the capacity to do so. Activities in breach of the benefit sharing obligation would thus include space exploration by individual States and cooperation activities between spacefaring countries, something which the documented history of space exploration does not support.<sup>72</sup> Another possible breach might arise from international cooperation partnerships with developing

<sup>67</sup> Likewise, scholars have pointed out that Ago's definition of obligation of result overlaps with the general understanding of obligation of conduct. Draft Article 21 of ARSIWA, as formulated by Ago, describes an obligation of result as 'an international obligation requiring the State to achieve a particular result *in concreto*, but leaving it free to choose at the outset the means of achieving that result'. Consequently, ILC Special Rapporteur Simma proposed to delete Draft Article 20 of ARSIWA. UNYBILC, vol I (1999) 276, para 7.

<sup>68</sup> UNCLC (n 34).  
<sup>69</sup> As discussed in Section II.A.1. See also N Jasentuliyana, 'The Role of Developing Countries in the Formulation of Space Law' (1995) 20 *AnnAir&SpaceL* 95, 124–5 (arguing that the claim to means of access by all countries goes beyond the remit of Article I of the Outer Space Treaty).

<sup>70</sup> The distinction between an obligation of conduct and an obligation of means does not entail any specific differentiation in terms of the legal consequences stemming from the breach of the obligation. See Combacau and Alland (n 66) 84 (denying the applicability of different regimes of responsibility) and Dupuy (n 65) 374 (referring to the applicable legal regime—that is to say, the legal consequences of the breach of obligation in terms of content, form and degree).

<sup>71</sup> Dupuy (n 65) 376.

<sup>72</sup> See, for instance, L Lebedev and A Romanov, *Rendezvous in Space: Soyuz–Apollo* (Central Books 1979)—detailing the historic docking of the joint Apollo–Soyuz mission by the United States and the Soviet Union in 1975.

countries which did not include transfer of space technology. This suggests that conceptualizing the benefit sharing obligation as an obligation of means results in a restrictive, if not arbitrary, interpretation.

Thirdly, understanding benefit sharing as an obligation of means does not identify the damaged State, nor does it determine who is authorized to take action if it is breached. As an asymmetrical obligation<sup>73</sup> assigning a special responsibility to spacefaring States to assist States lacking space technology,<sup>74</sup> the benefit sharing obligation does not appear to be an obligation *erga omnes*. At the same time, in the absence of an institution to manage the distribution of benefits deriving from space activities on behalf of the international community or a sector-specific dispute settlement mechanism,<sup>75</sup> the enforcement of the obligation necessarily rests on individual States. However, State practice shows that adjudication by national and international courts has not played any significant role in the progressive development of international space law.<sup>76</sup> It thus seems unlikely that States will act as the enforcers of the obligation of benefit sharing through adjudication.

In addition to these conceptual difficulties, subsequent practice suggests that the access to the means approach did not really garner a consensus at COPUOS.<sup>77</sup> Also, it is not currently supported by States. Calls for compulsory cooperation between developed and developing States, as well as mandatory technology transfer, have almost completely disappeared. The few remaining instances in which transfer of technology provisions feature are as bilateral agreements concluded between interested parties. For example, a Memorandum of Understanding concluded in 2013 between Brazil and a French company stipulates that, as part of an agreement to construct a geostationary satellite, the company must train selected Brazilian engineers and transfer a limited amount of technology.<sup>78</sup> In 2018, Japan and Rwanda concluded a similar Memorandum of Understanding for the development of

<sup>73</sup> Combacau and Alland (n 66) 100.      <sup>74</sup> See n 59.      <sup>75</sup> Deplano (n 24).      <sup>76</sup> *ibid.*

<sup>77</sup> See, for instance, COPUOS, UN Doc A/AC.105/484 (n 62) Annex III, 28–9, para 10 (pointing out the existence of ‘a currently well-functioning mechanism for sharing the benefits of outer space’) and 30, para 17 (stating that activities which benefit all countries already exist. They include the provision of meteorological data, space communications, television broadcasting and search and rescue activities); COPUOS, UN Doc A/AC.105/514 (n 57) 33, para 15 (lamenting that imposing compulsory cooperation with all States was not reasonable); COPUOS, ‘Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on the work of its Thirty-third Session’ (14 April 1994) UN Doc A/AC.105/573, 20, para 9 (stating that the lack of comment on a specific paragraph of the item under discussion by delegations ‘in no way signalled their approval or willingness to adopt those paragraphs’).

<sup>78</sup> For a detailed overview, see ÁF dos Santos, ‘A New Experience on the International Transfer of Space Technology’ in R Moro-Aguilar and PJ Blount (eds), *Proceedings of the International Institute of Space Law* (Eleven International Publishing 2015) 735, 744 (arguing that ‘this is a rare case where a developing country is being treated as a partner by a developed country’).



small satellites.<sup>79</sup> In such cases, technology transfer serves a capacity building, rather than redistributive, function. Most importantly, the obligation has a contractual, voluntary basis, rather than being treaty-based.

Outside of contractual obligations, calls for compulsory transfer of technology have been progressively replaced by invitations to promote, and possibly share, the use of space technology in support of development activities. For example, the outcome of the third UN Conference on the Exploration and Peaceful Uses of Outer Space calls for the recognition of the major contribution that space technology and its application can make to economic and social development.<sup>80</sup> Outside COPUOS, States have consistently engaged in cooperation partnerships that do not entail the mandatory transfer of technology. For example, since 2018, the European Union has been supporting the development of Satellite Based Augmentation System services providing 18 African countries with air traffic services.<sup>81</sup> At the same time, it is noteworthy that State practice remains silent on the issue of the equitable sharing of benefits deriving from space activities.

### *B. Access to Outer Space*

Emerging in the mid-1990s, the second claim concerning the content of the benefit sharing obligation is that all States have an equal right of access to outer space for the purposes of its exploration and use, subject to this being with the aim of benefitting the international community of States.<sup>82</sup> Like the access to the means claim, international cooperation is seen as the most practical way of achieving this.<sup>83</sup> However, this rests on two guiding principles which depart from the logic of the approach based on securing access to the means for space exploration and use.<sup>84</sup> First, cooperation

<sup>79</sup> Rwanda Space Agency, 'Press Release: Japanese and Rwandan Stakeholders in the Space Sector Create Plans for Collaboration' (2018) <<https://space.gov.rw/news/rwanda-japan-plan-for-collaboration/>>.

<sup>80</sup> UNGA, 'Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space' (18 October 1999) UN Doc A/CONF.184/6 (UNISPACEIII) 6, Resolution 1(I) and Annex, 10, para 1. See also the UNISPACEIII implementation document, UNGA, 'Review of the implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space' (23 July 2004) UN Doc A/59/174, ii (stating that the implementation of UNISPACEIII supports the overarching agendas of the UN Millennium Declaration and World Summit on Sustainable Development).

<sup>81</sup> For information, see European Union for the Space Programme (EUSPA), 'What is SBAS?' <[www.euspa.europa.eu/european-space/eu-space-programme/what-sbas](http://www.euspa.europa.eu/european-space/eu-space-programme/what-sbas)>.

<sup>82</sup> COPUOS, Report of the Legal Subcommittee on its fifty-sixth session (18 April 2017) UN Doc A/AC.105/1122, 32, para 242.

<sup>83</sup> COPUOS, 'Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on the work of its Thirty-fourth Session (27 March–7 April 1995)' (19 April 1995) UN Doc A/AC.105/607, Annex II, 27, para 58.

<sup>84</sup> COPUOS, 'Report of the Committee on the Peaceful Uses of Outer Space' (15 September 1995) UN Doc A/50/20, 23, para 132.

activities must ensure the efficient allocation of limited resources—primarily financial resources, but also technology and know-how—in order to avoid duplication of effort and waste.<sup>85</sup> Secondly, they must allow States to determine freely all aspects of their cooperation ‘on an equitable and mutually acceptable basis’.<sup>86</sup> Contrary to the access to the means claim, this means that developing countries are to be treated as equal partners with developed countries,<sup>87</sup> thus rejecting the idea that international cooperation is to be on more favourable terms for developing countries.

In addition, whilst strongly encouraging recourse to international cooperation in space activities, including cooperation with developing countries on an equitable basis,<sup>88</sup> the access to outer space claim considers this to be optional rather than mandatory—a voluntary choice on the part of those involved.<sup>89</sup> From a normative perspective, understanding international cooperation as an optional means to an end means that the access to outer space claim sees the benefit sharing obligation as an obligation of conduct, which is essentially an obligation of due diligence.<sup>90</sup> As a result, States are free to choose the means that they deem most suitable to fulfil the obligation.<sup>91</sup> Whilst flexible, the access to outer space claim is problematic in at least two respects.

First, it assumes that contributing to the overarching goal of cooperation in space activities automatically satisfies the due diligence obligation of benefit sharing. For example, in relation to scientific cooperation, delegations have stated that:

as long as activities [are] undertaken in an orderly manner, avoiding abuse, recklessness or risk-taking, and undertaken with the purpose of exploration of space, such activities should be considered for the benefit and in the general interest of all countries *because of the technological progress and scientific advancements following from such activities*.<sup>92</sup>

This means that it is for the actor performing a space activity to determine what amounts to a benefit for the international community. Whilst this might arguably be adequate for sharing the benefits of scientific missions, in the absence of equitable criteria, such an approach is not necessarily appropriate for determining the quantum of benefit sharing due in relation to commercial space activities.

Secondly, the access to outer space claim does not provide guidance on what the equitable requirement means. It appears from the quotation above<sup>93</sup> that in

<sup>85</sup> See, for instance, COPUOS, UN Doc A/AC.105/514 (n 57) 37–8, para 31; COPUOS, UN Doc A/AC.105/573 (n 77) 24, para 40; and UNGA (n 83) Annex II, 28, para 60.

<sup>86</sup> COPUOS (n 83) Annex II, 28, para 66.

<sup>87</sup> *ibid* 29, para 71; COPUOS, ‘Report of the Legal Subcommittee on the work of its Thirty-fifth Session (18–28 March 1996)’ (11 April 1996) UN Doc A/AC.105/639, 23, para 38 (stating that international cooperation brings States ‘on an equal footing’).

<sup>88</sup> COPUOS (n 83) 33, para II(5).

<sup>89</sup> COPUOS (n 84) 23, para 133.

<sup>90</sup> See n 66.

<sup>91</sup> COPUOS (n 84) 23, para 133.

<sup>92</sup> COPUOS (n 82) 32, para 242 (emphasis added).

<sup>93</sup> *ibid*.

international space law the obligation of due diligence requires that space activities must be conducted in an orderly, fair and transparent manner. Hence, it serves a purposive function. Conversely, under customary international law the due diligence obligation serves a preventive function.<sup>94</sup>

Other normative considerations relate to the moment at which State responsibility arises. Under the access to outer space claim, the breach of the obligation arises when the State intentionally or negligently acts without due diligence<sup>95</sup>—a situation widely recognized in international case law.<sup>96</sup> This requires a case-by-case assessment, rather than its being predetermined by the structure of the obligation, as in the case of the access to the means claim.<sup>97</sup> The obligation of conduct approach thus allows States to undertake cooperative space activities involving both developing and developed countries without breaching the obligation. Equally, it allows States to conclude partnership agreements involving transfer of technology and know-how on a voluntary basis. At the same time, the level of flexibility that this approach permits is a potential weaknesses, since it renders any assessment of compliance with the due diligence requirement highly subjective.

State practice shows that the access to outer space claim is widely supported. For instance, the work of both the European Space Agency (ESA)<sup>98</sup> and the African Space Agency<sup>99</sup> are informed by the principle of efficient allocation of resources. In addition, both the US-led Artemis missions to the Moon and the forthcoming establishment of an International Lunar Research Station by China and the Russian Federation foresee space resource utilization as being on a first-come, first-served basis while committing themselves to share the findings of scientific research with the international community, as appropriate.<sup>100</sup> At the same time, as with the access to the means claim, State

<sup>94</sup> See, for instance, International Court of Justice (ICJ), *Case Concerning the Application of the Convention on the Prevention and Punishment of the Crime of Genocide* [2007] ICJ Rep 43, 221, para 430 (stating that an obligation of conduct requires States ‘to employ all means reasonably available to them, so as to prevent [the occurrence of an event] so far as possible’).

<sup>95</sup> ICJ, *United States Diplomatic and Consular Staff in Tehran* [1980] ICJ Rep 3, 31, para 63 (identifying negligence as lack of due diligence).

<sup>96</sup> See, for instance, International Tribunal for the Law of the Sea (ITLOS), *Responsibilities and Obligations of States with Respect to Activities in the Area* (Advisory Opinion, 1 February 2011) [2011] ITLOS Rep 10, 41, para 110, acknowledging that an obligation of conduct requires States to ‘deploy adequate means to exercise best possible efforts, to do the utmost, to obtain [the intended] result’.

<sup>97</sup> As discussed in Section III.A.

<sup>98</sup> ESA, ESA Convention and Council Rules of Procedures, SP-1337/EN, November 2019, Annex II, art I (stating that ESA shall ‘follow the principles of sound financial management, economy and efficiency in the planning and management of resources’) and art II (requiring ‘the optimization of the use of the Agency’s resources’).

<sup>99</sup> Treaty adopting the Statute of the African Space Agency (signed 29 January 2018, entered into force 29 January 2018) art 4(e) and (g)—indicating that the objectives of the African Space Agency include ‘avoid[ing] or minimiz[ing] duplication of resources and efforts’ and promoting ‘mutually beneficial partnerships’, respectively. See African Union, ‘Statute of the African Space Agency’ <<https://au.int/en/treaties/statute-african-space-agency>>.

<sup>100</sup> National Aeronautics and Space Administration (NASA), ‘The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of The Moon, Mars, Comets, and Asteroids for

practice does not clarify what cooperation with developing countries on an equitable basis entails, something which the access to outer space claim openly encourages.

### *C. Access to Space Resources*

Emerging at the turn of the millennium, the third claim concerning the content of the benefit sharing obligation is that the exploration and use of outer space must be inclusive.<sup>101</sup> While individual States have an equal right to access outer space, space activities must benefit the international community as a whole<sup>102</sup> on an equitable<sup>103</sup> and non-discriminatory basis.<sup>104</sup> Compared to the other two claims, the access to space resources claim has a narrower focus. Given that space resources are currently accessible only to a limited number of States and a handful of enterprises within those States,<sup>105</sup> it advocates the creation of an international mechanism specifically designed for the coordination of space resource activities and the sharing of extracted resources.<sup>106</sup>

By requiring the sharing of space resources rather than the sharing of the benefits deriving from space activities, the access to space resources claim sees the benefit sharing obligation in Article I, paragraph 1, of the Outer Space Treaty as an obligation of result with its own particular characteristics. On the one hand, the theoretical underpinnings of the claim involve considering the international community as itself having international legal

Peaceful Purposes' (2020) Section 10(2) <[www.nasa.gov/specials/artemis-accords/index.html](http://www.nasa.gov/specials/artemis-accords/index.html)> ('the extraction and utilization of space resources ... should be executed ... in support of safe and sustainable space activities'); China National Space Administration, *International Lunar Research Station (ILRS): Guide for Partnership* (16 June 2021) 2 <[www.cnsa.gov.cn/english/n6465652/n6465653/c6812150/content.html](http://www.cnsa.gov.cn/english/n6465652/n6465653/c6812150/content.html)>.

<sup>101</sup> COPUOS (n 82) 30, para 229 (stating that the developing countries should not be excluded from the benefits of space exploration. Their rights must form part of the discussions at COPUOS).

<sup>102</sup> *ibid* 31, para 230; COPUOS, 'Report of the Legal Subcommittee on its fifty-seventh session' (30 April 2018) UN Doc A/AC.105/1177, 31, para 244. See also COPUOS (n 82) 31, para 238 (all States and peoples should enjoy the benefits of space exploration); COPUOS, UN Doc A/AC.105/1177 *ibid* 32, para 257 (it is of primary interest to ensure that humanity as a whole benefits from space resource utilization).

<sup>103</sup> COPUOS, 'Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on its sixtieth session' (24 June 2021) UN Doc A/AC.105/1243, 31, para 242. See also COPUOS 'Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on its sixty-first session' (19 April 2022) UN Doc A/AC.105/1260, 28, para 215 (calling for the equitable implementation of any future framework for space resource utilization); and COPUOS, Legal Subcommittee, 'Responses to the set of questions provided by the Moderator and Vice-Moderator of the Scheduled Informal Consultations on Space Resources' (31 May 2021) UN Doc A/AC.105/C.2/2021/CRP.8, 7—statement by Ethiopia (lamenting 'lack of equity of utilization of space resources').

<sup>104</sup> COPUOS, UN Doc A/AC.105/1177 (n 102) 31, para 243.

<sup>105</sup> *ibid* 30–1, para 241; COPUOS, 'Committee on the Peaceful Uses of Outer Space: Report of the Legal Subcommittee on its fifty-eighth session' (18 April 2019) UN Doc A/AC.105/1203, 34, para 254.

<sup>106</sup> COPUOS (n 82) 31, para 231; COPUOS, UN Doc A/AC.105/1177 (n 102) 31, para 242 (the issue of access to resources needs to be regulated).

personality.<sup>107</sup> Although supported by some scholars,<sup>108</sup> this is grounded on a de-contextualized analogy with the law of the sea and appears to go beyond the letter and spirit of the Outer Space Treaty. For instance, Article 137(2), UNCLOS states that '[a]ll rights in the resources of the Area are vested in mankind as a whole, on whose behalf the [International Seabed] Authority shall act'. However, the Outer Space Treaty does not establish an institution equivalent to the ISA acting on behalf of humanity.

On the other hand, the access to space resources claim presupposes that space resources are, legally speaking, collective property.<sup>109</sup> Whilst this accords with the legal underpinnings of the Moon Agreement, it is not supported by the letter of the Outer Space Treaty.<sup>110</sup> Also, it does not indicate criteria for sharing the extracted resources. It simply implies that a breach of the benefit sharing obligation occurs whenever resources are not shared with the international community of States, possibly on the basis of equality. This suggests that the benefit sharing obligation is an *erga omnes* obligation, meaning that every State party to the Outer Space Treaty has a legal interest in compliance with the benefit sharing obligation.<sup>111</sup>

However, having an interest in compliance with the obligation does not itself confer an entitlement to enforce the obligation for two main reasons. First, the *erga omnes* character of the benefit sharing obligation does not automatically mean that every State has suffered damage. Given its treaty-based origin, the alleged right to a share of space resources is only opposable to States parties to the Outer Space Treaty, not to the international community as a whole.<sup>112</sup> Secondly, since the Outer Space Treaty does not explicitly establish the benefit sharing obligation as *erga omnes* (nor does the latter possess customary status),<sup>113</sup> the corresponding right can be enforced only by a party which has been injured by a breach of the benefit sharing obligation.<sup>114</sup> Yet, while all States parties to the Outer Space Treaty have a common interest in

<sup>107</sup> COPUOS, UN Doc A/AC.105/1177 (n 102) 32, para 250 ('the international community of States ha[s] jurisdiction over space resources as well as the right and duty to develop an appropriate legal framework for such activities'); *ibid* 32, para 252 ('the development of a regulatory regime on the exploitation of space resource[s] is a right of the international community as a whole').

<sup>108</sup> Cocca (n 8) 69 (arguing that the Outer Space Treaty confers 'a legal content [to] the human race'); R Maqueda, 'Something More about Humanity as a Subject of Law' (1970) 13 *ProcColloqLOuterSpace* 215, 217 ('Humanity is subject to rights and obligations [under the space treaties]'); SM Williams, 'The Role of Equity in the Law of Outer Space' (1975) 5 *IntRel* 776, 795 (arguing that States act as 'legal representatives of the interests of [hu]mankind').

<sup>109</sup> AA Cocca, 'Some Comments on a True Step toward International Cooperation: The Treaty of January 27, 1967' (1971) 20 *DePaulLRev* 581, 585 ('The new subject is given a patrimony, in accordance with its nature.') See also COPUOS, UN Doc A/AC.105/514 (n 57) 36, para 23 (arguing that outer space should be considered as the common heritage of mankind).

<sup>110</sup> As discussed in Section II.A.2.

<sup>111</sup> ICJ, *Barcelona Traction, Light and Power Company, Limited* [1970] ICJ Rep 3, 32, para 33; ICJ, *Questions Relating to the Obligation to Prosecute or Extradite* [2012] ICJ Rep 442, 449, para 68.

<sup>112</sup> *Obligation to Prosecute or Extradite* *ibid* 458–9, para 106.

<sup>113</sup> H Thirlway, *The Sources of International Law* (2nd edn, OUP 2019) 170–1.

<sup>114</sup> *ibid* 70.

securing compliance with the benefit sharing obligation, the lack of benefit sharing criteria prevents the determination of which States have been the injured—and hence the enforceability of the obligation.

In addition to the conceptual difficulties associated with the enforcement of an obligation of result, State practice suggests that the access to space resources claim is not widely supported. For instance, several delegations at COPUOS have qualified the obligation of benefit sharing by pointing to the efforts of States conducting space resource activities, in addition to ensuring that all States can ‘benefit in ways that [do] not have a negative impact on investment incentives for public and private engagement and participation in such activities’.<sup>115</sup> Similarly, other delegations have called for the elaboration of a set of practical principles to guide States in how to conduct space resource activities ‘with due regard to the rights of others’, including the right of States to conduct space resource activities ‘in a sustainable, economically viable and rational manner’.<sup>116</sup>

It is likely that the access to space resources claim will continue to develop as the work of the COPUOS Working Group on the Legality of Space Resource Activities unfolds. As it stands, it converges with the other two claims in recognizing that benefit sharing in relation to activities conducted in outer space entails international cooperation and equitable considerations. Like the access to the means claim, it foresees an instrumental role for international cooperation (as opposed to the enabling role that is found in the access to outer space claim). It also envisions a role for equity in the determination of the appropriate amounts to be shared with the international community. However, like the other two claims, it does not elaborate on this, meaning that it remains, in effect, an aspirational goal in need of actualization. The next section addresses this conceptual gap.

#### IV. THE ROLE OF EQUITY IN THE STRUCTURE OF THE OBLIGATION

Although largely mutually exclusive, the three claims concerning benefit all acknowledge that there is a role for equity in the structure of the obligation (Table 1). However, none of them elaborates on the functions that equity serves and their theoretical underpinnings. Also, they do not provide criteria concerning how the equitable sharing of the benefits deriving from the exploration and use of outer space happen.

This section fills the theoretical gap by examining how the equitable sharing requirement operates when informed by the principles which underpin the claim of access to space resources (Section A) and the claim of access to outer space (Section B), respectively—these being the two claims which are currently supported by State practice.

<sup>115</sup> COPUOS, UN Doc A/AC.105/1260 (n 103) 28, para 213.

<sup>116</sup> *ibid* 29, para 221; COPUOS, Legal Subcommittee (n 103) 9—statement by Finland.

TABLE 1:  
Normative elements of the three claims on benefit sharing

Claim	Legal status of outer space	Goals	Required actions
Access to the means	Inclusive environment	Equitable sharing of benefits	International cooperation entailing international assistance Equitable considerations
Access to outer space	Inclusive environment	Equitable access to outer space (entailing equitable sharing of benefits)	International cooperation on mutually agreed terms Equitable considerations
Access to space resources	Common property	Equitable sharing of space resources	International cooperation regulated by a multilateral regime for space resources utilization Equitable considerations

#### A. The Function of Equity in the Obligation of Result

The access to space resources approach envisions benefit sharing as an obligation of result.<sup>117</sup> Within this, equity appears to serve a distributive function, providing access to space resources to countries which lack the capacity to undertake extraction activities and balancing the interests of States with differing space capabilities.<sup>118</sup> This approach finds support in both the scholarly literature<sup>119</sup> and international case law.<sup>120</sup> Similarly, the Moon Agreement acknowledges that the equitable sharing of benefits derived from the exploitation of the Moon's resources involves special consideration being given to both 'the interests and needs of developing countries' and 'the efforts of those countries which have contributed whether directly or indirectly to the exploration of the Moon'.<sup>121</sup>

Some scholars argue that the normative origins of the concept of equity as distributive justice lie in the space treaties,<sup>122</sup> which contain several references to equity (Table 2). For instance, Article XII of the Liability

<sup>117</sup> As discussed in Section III.C.

<sup>118</sup> COPUOS, UN Doc A/AC.105/573 (n 77) 21, para 17 and 22, para 24 (referring to the 'special needs' of developing countries in space technology).

<sup>119</sup> Williams (n 108) 785.  
<sup>120</sup> Permanent Court of Arbitration, *Island of Palmas* (1928) 2 UN Rep Intl Arb Awards 829, 870 ('international law, like law in general, has the object of assuring the co-existence of different interests which are worthy of legal protection'—statement of arbitrator Huber).

<sup>121</sup> Moon Agreement (n 19) art 11, para 7(d).

<sup>122</sup> Williams (n 108) 776 (also pointing to the lack of any case law on international space law); SD Mau, 'Equity, the Third World and the Moon Treaty' (1984) 8 Suffolk Transnatl LJ 221, 225 (referring to equity as 'the basis for a redistribution of the world's wealth').

TABLE 2:  
References to equity in the UN outer space treaties

Treaty	Equity	
	Direct reference	Indirect reference
Outer Space Treaty (1967)	n/a	n/a
Rescue Agreement (1968)	n/a	n/a
Liability Convention (1972)	Preamble, para 4 Article XII	Article XIX
Registration Convention (1975)	Article VI	n/a
Moon Agreement (1979)	Article 11(7)(d)	n/a

Convention refers to equity as the criterion for determining compensation for damage. Equity is referred to indirectly in Article IX of the Outer Space Treaty, which requires that due regard be given to the corresponding activities of other States in space. The latter is also considered an equitable principle in its own right.<sup>123</sup>

UNGA resolutions also provide a principled approach to space activities and contain several references to equity in support of redistributive goals (Table 3). For instance, Principle XII of the Principles on the Remote Sensing of the Earth requires the sensing State to grant the sensed State access to the resulting information on a non-discriminatory basis and at a reasonable cost, taking particular account of the needs and the interests of developing countries. Similarly, paragraph 2 of the Principles on Direct Television Broadcasting states that satellite broadcasting ‘should promote the free dissemination and mutual exchange of information and knowledge ... particularly in developing countries’.

Other scholars argue that the concept of equity as distributive justice originates in the economics and politics of decolonization and has its normative roots in the resolutions on the New International Economic Order (NIEO),<sup>124</sup> which recognize that the benefits of technological progress are not equitably distributed among the members of the international community.<sup>125</sup> Viewed from this angle, the application of equity requires the broadest level of cooperation among States with a view to eliminating economic, social and political disparities among them.<sup>126</sup>

Taken together, these considerations suggest that equity as a means for distributive justice focuses on the identity of beneficiaries, the interests

<sup>123</sup> Williams (n 108) 784.

<sup>124</sup> MW Janis, ‘The Ambiguity of Equity in International Law’ (1983) 9(7) *BrookJIntlL* 7, 16–17.

<sup>125</sup> Declaration on the Establishment of a New International Economic Order. UNGA Res 3201 (S-VI) (1 May 1974) UN Doc A/RES/3201(S-VI) para 1.

<sup>126</sup> Charter of Economic Rights and Duties. UNGA Res 29/3281 (12 December 1974) UN Doc A/RES/29/3281, art 7.



TABLE 3:  
References to equity in non-binding instruments

International law instrument	Equity	
	Direct reference	Indirect reference
Declaration on Legal Principles (1963)	n/a	n/a
Direct Television Broadcasting (1982)	n/a	Para 2 Para 6 Para 11
Principles on Remote Sensing (1986)	Principle V	Principle II Principle IX Principle XII Principle XIII
Principles on Nuclear Power Sources (1992)	Principle 9, para 2	Principle 7, para 2
Declaration on International Cooperation (1996)	Para 2 Para 3	Para 1

protected by the redistributive process and the legal status of outer space, including its resources.

The ultimate beneficiary of the exploration and use of outer space is humanity as a whole.<sup>127</sup> As Williams argues, the space treaties ensure that State interests do not have priority over the interests of the international community.<sup>128</sup> For instance, in relation to the remote sensing of the Earth by satellite, the international community of States, acting on behalf of humanity, ‘has a certain right to intervene’ in the regulation of matters such as ‘economic advantages derived from speculation’.<sup>129</sup> International tribunals should therefore be empowered to decide such cases on the basis of the principles of justice and equity.<sup>130</sup>

Legally, outer space, including its resources, is the common property of humanity.<sup>131</sup> Given that the subject of space law is humanity as a whole, this leads to the conclusion that ‘the benefits obtained by whoever may materially extract such products, belong *ab initio* to Humanity’.<sup>132</sup> Accordingly, States able to extract space resources are only entitled to ‘an adequate compensation’ for having done so.<sup>133</sup>

In terms of interests protected, some scholars argue that equity in international space law serves an anticipatory function—namely, that of

<sup>127</sup> AA Cocca, ‘Space Law and the Right of Mankind’ (1990) 33 ProcColloqOuterSpace 278 (describing humankind as a new legal subject created by the Outer Space Treaty). See also Williams (n 108) 792.

<sup>128</sup> Williams (n 108) 786, 799 (‘the interest of any state or group of States is always subordinated to the interest of mankind’).<sup>129</sup> *ibid* 785.<sup>130</sup> *ibid* 786.<sup>131</sup> *ibid* 792, 798.

<sup>132</sup> AA Cocca, ‘Determination of the Meaning of the Expression “*Res Communes Humanitatis*” in Space Law’ (1963) 6 ProcColloqOuterSpace 3.<sup>133</sup> *ibid* 4.

being the ‘inspirer of norms and, to a lesser extent, [of guidance] in the application of norms’ governing space activities.<sup>134</sup> For instance, Janis writes that international law, including international space law, should aim at granting ‘prominence to the principle of equity’ and its distributive function.<sup>135</sup> Similarly, Haq writes that ‘[t]he case for obligatory transfer of resources rests ultimately on [the acceptance and implementation of] the principle of distributive justice and economic equity in the global context’.<sup>136</sup> In doing so, scholars end up advocating a function of equity *ante legem*, which is not recognized in international law. The latter distinguishes between three typologies of equity,<sup>137</sup> all qualifying equity as a judicial remedy.<sup>138</sup>

Equity as distributive justice does not relate to the exercise of judicial discretion, but seeks to influence the development of the law.<sup>139</sup> This suggests that equity *ante legem* could be judicially enforced only as a matter of decision *ex aequo et bono*—that is to say, through a decision not necessarily based on the law<sup>140</sup> and, as such, requiring the consent of the parties.<sup>141</sup> Whilst decisions *ex aequo et bono* occasionally involve consideration of distributive justice,<sup>142</sup> it is noteworthy that the International Court of Justice (ICJ) on several occasions has confirmed that equity is an *ad hoc* corrective rather than a tool for distributive justice.<sup>143</sup>

It has been argued that provisions of the UN space treaties which aim at distributive justice, such as Article 11(7) of the Moon Agreement, turn out to be ‘of difficult, if at all possible, practical (normative) application’.<sup>144</sup> More

<sup>134</sup> Williams (n 108) 799.

<sup>135</sup> M Bedjaoui, *Towards a New International Economic Order* (Holmes and Meier 1979) 119.

<sup>136</sup> I Haq, ‘From Charity to Obligation: A Third World Perspective on Concessional Resource Transfers’ (1979) 14 *TexIntlLJ* 389, 406, 423 (describing international law as an emerging law of ‘need based entitlement’).

<sup>137</sup> ICJ, *Case Concerning the Frontier Dispute* [1986] ICJ Rep 554, 567–8, para 28 (distinguishing between equity *infra legem*, *praeter legem* and *contra legem*). For a detailed analysis of the three functions of equity, see C Titi, *The Function of Equity in International Law* (OUP 2021)—also arguing that equity *contra legem* is a contradictory concept.

<sup>138</sup> Janis (n 124) 8 (arguing that ‘equity is a discretionary corrective (applied in a specific case) of a strict universal rule’). See also C Grauer, ‘The Role of Equity in the Jurisprudence of the World Court’ (1979) 37 *UTorontoFacLRev* 101 (cautioning about the difficulty of interpreting individual cases as falling neatly into any category).

<sup>139</sup> Janis (n 124) 20; Titi (n 137) 76 (arguing that equity as distributive justice involves ‘an extra-legal dimension’).

<sup>140</sup> B Cheng, ‘Justice and Equity in International Law’ (1955) *CLP* 185, 203–4 (arguing that decisions *ex aequo et bono* ‘imply decisions based on practical considerations and expediency, disregarding, if necessary, existing law and recognized rights’).

<sup>141</sup> Permanent Court of International Justice (PCIJ), *Free Zones of Upper Savoy and the District of Gex (Second phase)* (Judgment), PCIJ Series A/B No 46 (1930) 96, 161 (arguing that the Court cannot apply norms lacking legal validity unless the parties have authorized it to do so).

<sup>142</sup> A Gourgourinis, ‘Delineating the Normativity of Equity in International Law’ (2009) 11(3) *IntCLRev* 327, 332 (referring to ‘the [occasional] importation of facets of distributive justice’).

<sup>143</sup> See, for instance, ICJ, *South West Africa Cases* [1966] ICJ Rep 6, 34, para 49; ICJ, *Case Concerning the Continental Shelf (Tunisia v Libyan Arab Jamahiriya)* [1982] ICJ Rep 18, 60, para 71. *Contra*, see ICJ, *Corfu Channel Case* [1949] ICJ Rep 4, 22 (partly grounding its decision on humanitarian considerations).

<sup>144</sup> Gourgourinis (n 142) 342.

generally, it is argued that equity expressed in the form of demands of distributive justice is 'of doubtful legal significance'.<sup>145</sup> This suggests that the access to space resources claim does not include equity as an anticipatory test. It does, however, require the equitable distribution of resources, effectively inviting consideration of proportionality embedding the principle of distributive justice.<sup>146</sup> This is explored in Section V.A.

### *B. The Function of Equity in the Obligation of Due Diligence*

The access to outer space claim is rooted in an obligation of due diligence.<sup>147</sup> Under this approach the efficient allocation of resources and international cooperation on an equitable and mutually acceptable basis are the guiding principles for space activities. Yet, like the access to space resources claim, it does not clarify how equitable sharing through cooperation with other countries in space activities will take place.

The principle of efficient allocation of resources as the rationale for undertaking collaborative space activities is widely recognized in international space law. For example, Article 5 of the Declaration on International Cooperation states that the 'rational and efficient allocation of financial and technical resources' should inform the conduct of collaborative space activities.<sup>148</sup> Similarly, regional space treaties list the efficient use of resources as an integral component of collaborative space activities.<sup>149</sup> At the same time, references to efficient utilization of resources are not confined to the law of outer space. For example, UNCLOS refers to 'the equitable and efficient utilization of [the seas and oceans'] resources'.<sup>150</sup> However, none of these documents clarify the relationship between the concepts of efficiency and equity in context of an obligation of due diligence.

The only proposal so far advanced by delegations at COPUOS that seeks to do so appears in a joint paper submitted by Luxembourg and the Netherlands concerning the lawfulness of space resource activities.<sup>151</sup> Aimed at benefit sharing through the promotion of participation in space resource activities by all countries, the proposal lists several types of benefits deriving from those activities.<sup>152</sup> Of particular relevance is the provision stating that space actors

<sup>145</sup> *ibid.*

<sup>146</sup> Janis (n 124) 22, 30–1 (referring to equity as 'measured or proportionate justice'); Titi (n 137) 76 (arguing that the notion of distributive justice 'encompasses the idea of proportional or meritorious equality').

<sup>147</sup> As discussed in Section III.B.  
<sup>148</sup> The second requirement consists of considerations relating to the need of developing countries for technical assistance. Declaration on International Cooperation (n 20) art 5.

<sup>149</sup> ESA Convention and Council Rules of Procedures (n 98); Treaty adopting the Statute of the African Space Agency (n 99).

<sup>150</sup> UNCLOS (n 34) Preamble, para 4.  
<sup>151</sup> COPUOS, 'Committee on the Peaceful Uses of Outer Space: Building blocks for the development of an international framework on space resource activities' (3 February 2020) UN Doc A/AC.105/C.2/L.315.

<sup>152</sup> They include promoting exchange of information and fostering both space capabilities and space applications: *ibid* 5, para 13(1).

‘should be encouraged to provide for benefit sharing’,<sup>153</sup> since it shows that the relationship between equitable sharing of benefits and efficiency of resource utilization ‘does not necessarily imply equality’ among States.<sup>154</sup> As Menter also notes, the share of any benefits due to a non-contributing State may be zero,<sup>155</sup> thus suggesting that the determination of equity is inherently subjective.<sup>156</sup> Further evidence that equity in this context is subjective and discretionary is the clarification that benefit sharing does not include compulsory monetary sharing.<sup>157</sup>

Ultimately, the Luxembourgish–Dutch proposal appears to favour the amicable determination of the quantum of equitable benefit sharing in relation to space activities. However, absent agreement among States, the working paper does not offer any guidance on how to determine the criteria for doing so. This leads to the conclusion that the obligation of benefit sharing comes down to attempting to find an agreement among States on equitable sharing. This is problematic, since discretion and flexibility can turn into arbitrariness.<sup>158</sup>

Perhaps it is unavoidable that international space law is particularly exposed to the risk of flexibility descending into arbitrariness, the main reason being that the source of equity consists of State practice and soft law—such as the Luxembourgish–Dutch proposal and, to an extent, the Declaration on International Cooperation—instead of binding law, such as treaty, custom or general principles of law. It is nonetheless possible to consider due diligence as the guiding principle for the determination of the equitable sharing of benefits in the context of the access to outer space claim.

Obligations of conduct are often associated with the equitable principle of due diligence, which is also a general principle of law.<sup>159</sup> Although Article I, paragraph 1 of the Outer Space Treaty does not refer to it, the structure of the benefit sharing obligation, coupled with State practice at COPUOS, points to the existence of a requirement to act with due diligence, taking into account context and circumstances.<sup>160</sup>

States do not act with due diligence only for legal reasons. McDonald argues that policy reasons for doing so include the efficient use of resources, effective

<sup>153</sup> *ibid* 5, para 13(3) (emphasis added).

<sup>154</sup> ICJ, *North Sea Continental Shelf Cases* [1969] ICJ Rep 3, 49, para 91; *Frontier Dispute* (n 137) 633.

<sup>155</sup> M Menter, ‘Commercial Space Activities under the Moon Treaty’ (1979–80) 7(2) *SyracuseJIntlL&Com* 213, 232.

<sup>156</sup> R Lapidot, ‘Equity in International Law’ (1987) 22(2) *IsLR* 161, 180; M Akehurst, ‘Equity and General Principles of Law’ (1976) 25 *ICLQ* 801, 809 (also noting that ‘ideas of equity often vary according to the interests and culture of the States concerned’).

<sup>157</sup> UNGA (n 151) 5, para 13(2).

<sup>158</sup> *North Sea Continental Shelf cases* (n 154) 166 (dissenting opinion of Judge Koretsky—arguing that reliance on such a vague notion as equity may lead to subjective and potentially arbitrary evaluations). See also SK Chattopadhyay, ‘Equity in International Law: Its Growth and Development’ (1975) 5 *GaJIntl&CompL* 381 (arguing that it is difficult to define equity).

<sup>159</sup> R Mackenzie-Gray Scott, ‘Due Diligence as a Secondary Rule of General International Law’ (2021) 34(2) *LJIL* 343, 355–6.

<sup>160</sup> N McDonald, ‘The Role of Due Diligence in International Law’ (2019) 68(4) *ICLQ* 1041, 1045.

decision making and controlling costs, for example.<sup>161</sup> This suggests that any assessment of what is equitable within a due diligence obligation requires a case-by-case approach.<sup>162</sup> The absence of a benefit sharing mechanism in the Outer Space Treaty further indicates that equity plays a supplementary role—that is to say, it facilitates solutions ‘by balancing the relevant circumstances in an area where the law does not provide sufficiently detailed rules’.<sup>163</sup>

This means that, over time, ‘due diligence practice by States can ... serve a law-generating function’ in the field of benefit sharing.<sup>164</sup> This suggests that, in the absence of equitable criteria, a proportionality test which embeds due diligence considerations in the benefit sharing obligation appears to be a suitable approach, and avoids turning equity into a discretionary judicial corrective or a distributive mechanism. As Janis puts it, a third type of equity (which is neither distributive nor wholly discretionary) requires that ‘the result is fairly proportional to some non-legal standards’.<sup>165</sup> This would embrace both the contributions of those involved in activities in space and the needs of developing countries (Section V.B).

#### V. REORIENTING THE DEBATE: TOWARDS PROPORTIONALITY?

The concepts of equity and proportionality are intimately related to the idea of justice<sup>166</sup> and fairness.<sup>167</sup> They are also related to each other. For example, Reuter describes proportionality as an application of equity.<sup>168</sup> This indicates that it is possible to achieve an equitable result through recourse to proportionality, including in relation to the obligation of benefit sharing under the Outer Space Treaty. Given that the anticipatory equity test is not applicable to claims of access to outer space and access to space resources,<sup>169</sup> this section examines possible models for a proportionality test that could be applied by both space actors and a court of law.

Section A examines the feasibility of developing a proportionality test aimed at achieving distributive justice within the context of the obligation of result which forms a part of the claim to access to space resources. It shows that, as a test derived from an analogy with the law of the sea, it is unlikely to produce the desired results. Section B develops a new approach which is tailored to the

<sup>161</sup> *ibid* 1049.

<sup>162</sup> *ibid* 1042, 1054 (arguing that there is no general rule or principle of due diligence in international law).

<sup>163</sup> Titi (n 137) 82. See also *Tunisia v Libyan Arab Jamahiriya* (n 143) dissenting opinion of Judge Jiménez de Aréchaga, 26 (describing equity operating in the absence of specific rules as ‘the “lead rule” well adapted to the shape of the situation to be measured’).

<sup>164</sup> McDonald (n 160) 1053.

<sup>165</sup> Janis (n 124) 32.

<sup>166</sup> Lapidoth (n 156) 178 (arguing that justice is ‘equality in relation and in proportion’).

<sup>167</sup> ICJ, *Continental Shelf (Malta v Libya)* [1985] ICJ Rep 13, 38, para 45 (stating that the delimitation should be effected ‘in accordance with equitable principles ... in order to achieve an equitable result’).

<sup>168</sup> P Reuter, ‘Quelques réflexions sur l’équité internationale’ (1980) 15 RBDI 165.

<sup>169</sup> As discussed in Section IV.B and C.

obligation of conduct which underpins the access to outer space claim, and which requires the application of due diligence. Section C evaluates the impact of adopting a proportionality test based on due diligence considerations upon the progressive development of international space law and other areas of international law.

### A. Proportionality in Relation to Inequalities

The obligation of result which is embedded in the claim based on access to space resources means that there should be an equivalence among States with unequal space capabilities in terms of receiving and enjoying the benefits resulting from the exploitation of space resources. This requires a balancing of different interests<sup>170</sup> through a proportionality test which takes account of such inequalities. This reflects the approach found in documents inspired by the NIEO. For instance, the Seoul Declaration on Progressive Development of Principles of a NIEO states that 'equal cases have to be treated equally [and] unequal cases ... differently *in proportion to those inequalities* which are *relevant*'.<sup>171</sup> However, it does not find support in international case law. For example, in *Tunisia v Libya*, the ICJ held that 'the only absolute requirement of equity [applying to a question of proportionality] is that one should compare like with like'.<sup>172</sup>

Establishing the appropriate balance of interests where such inequalities exist requires a subjective assessment taking account of social, political and economic factors. According to Lapidoth, equivalence consists of an impartial search for a balance between interests, especially in the presence of special circumstances.<sup>173</sup> However, what amounts to such special circumstances where there are deep inequalities among States is difficult to ascertain. Article 160(f)(i) UNCLOS clarifies that the special circumstances relevant to 'the equitable sharing of financial and other economic benefits derived from activities in the Area [consist of] the interests and needs of developing States'. This indicates that the determination of equivalence of interests among States with unequal capabilities, including space capabilities, requires a needs-based approach to achieve the intended distributive justice goals.<sup>174</sup> It also suggests that the needs and interests of States in general form the basis of the determination of equivalence, as opposed to the needs and interests of individual States.

<sup>170</sup> Lapidoth (n 156) 178.

<sup>171</sup> International Law Association, Seoul Declaration on Progressive Development of Principles of Public International Law Relating to a New International Economic Order, Report of the Sixty-Second Conference (Seoul, 1986) art 8.

<sup>172</sup> *Tunisia v Libyan Arab Jamahiriya* (n 143) 76, para 104.

<sup>173</sup> Lapidoth (n 156) 178.

<sup>174</sup> See also UNCLOS (n 34) art 140 (requiring that the interests and needs of developing countries are taken into account when exploiting the resources of the Area, effectively including considerations of distributive justice aimed at correcting inequalities among States).

A technical study on the sharing of benefits deriving from deep seabed mining by the ISA Financial Committee provides a test for determining the interests and needs of developing countries and for the proportional distribution of benefits.<sup>175</sup> Its theoretical underpinning is that equitable sharing consists of ‘a state in which each ISA member’s welfare is increased to the maximum extent possible, without making any other ISA member worse off, given the limited resources in the Area and the [deep seabed mining] returns available for distribution’.<sup>176</sup> It thus matches the conceptual premises of the obligation of result embedded in the access to space resources claim.<sup>177</sup>

A central part of the ISA proportionality test involves determining an appropriate level of benefit sharing, which is a requirement of equity also acknowledged in international case law.<sup>178</sup> Appropriateness in this context ‘expresses what is reasonable and customary in a sharing situation’ and it is ‘shaped partly by principle, partly by precedent, and partly by what can be practically implemented’.<sup>179</sup> In practice, the ISA proportionality test applies the formula which is used by the UN for the allocation of State contributions to its budget, the reason being that this represents ‘the revealed preference of the highest possible global authority and representation of humanity, the UN General Assembly, to develop appropriateness and income progressivity ... in a manner consistent with UNCLOS’.<sup>180</sup> In doing so, it builds on a widely accepted formula for the equitable allocation of the financial burdens which are treaty based.

By adapting the UN budget formula to the UNCLOS requirements, the ISA proportionality test identifies the equity criteria which are applicable to deep seabed mining operations. They consist of ‘permanent formulae (algorithms)’ expressing proportions of the total benefit multiplied by the deep seabed proceeds generated in a given time period.<sup>181</sup> Specifically, in order to produce a progressive allocation of the funds (deep seabed royalties),<sup>182</sup> the sharing formula considers:

<sup>175</sup> ISA, *Equitable Sharing of Financial and Other Economic Benefits from Deep-Seabed Mining*, ISA Technical Study No 31 (ISA 2021) 26. In theory, considerations of intergenerational equity are also important. However, neither UNCLOS nor the 1994 Agreement provide any guidance on the appropriate allocation of deep seabed mining benefits across generations. As a result, ISA will make the determination. *ibid* 27–8. <sup>176</sup> *ibid* 33, 37 (identical definition).

<sup>177</sup> As discussed in Section III.C.

<sup>178</sup> See, for instance, *Tunisia v Libyan Arab Jamahiriya* (n 143) 59, para 70 (‘The principles to be indicated by the Court have to be selected according to their appropriateness for reaching an equitable result.’) <sup>179</sup> ISA (n 175) 33. <sup>180</sup> *ibid* 34. <sup>181</sup> *ibid* 37.

<sup>182</sup> *ibid* 38. Progressivity is defined to mean that the shares of proceeds received by low-income States Parties for Article 140 proceeds and low-income landlocked countries in the case of Article 82 proceeds are higher than the shares received by higher-income States Parties and high-income landlocked coastal States Parties, respectively. The reference point is given by mean global per capita income. *Ibid* 38.

TABLE 4:  
Equitable distribution by ISA regions

UN regional group	Proportion of equitable distribution (%)
Africa Group	28.144
Asia-Pacific Group	26.946
Latin American and Caribbean Group	17.356
Eastern European Group	13.722
Western European and Other Group	13.722

Source: ISA Technical Study (2021) 58.

each State party's share of the total population of all States parties ... adjusted by social distribution weights that can be used to account for either the article 140 or article 82 [UNCLOS] criteria by giving greater weight, *as appropriate*, to States parties that are low-income or low-income and landlocked, respectively, compared to higher-income and coastal beneficiaries.<sup>183</sup>

Known as the geometrical mean formula, the resulting equitable distribution algorithm produces the distribution of shares indicated in Table 4.<sup>184</sup>

Although conceptually sophisticated, the ISA proportionality test for benefit sharing can only allocate modest resources, thus generating limited impacts on the target beneficiaries.<sup>185</sup> As the ISA technical study explains, the funds available for sharing consist of the net funds remaining after the payment of the ISA's administrative expenses since its inception in 1998<sup>186</sup> and the payment of compensation to developing countries suffering serious adverse effects on their export earnings or economies because of activities in the Area.<sup>187</sup> As a result, the test is unable to achieve the distributive justice goal of correcting inequalities among the international community of States—at least in the foreseeable future.

Despite this limitation, the ISA proportionality test does offer a template for the equitable sharing of benefits deriving from the exploration and use of outer space.<sup>188</sup> In particular, its reliance on the UN budget formula satisfies the requirement of simultaneously considering the interests and needs of all developing countries at a given point in time, as the access to resources claim requires.<sup>189</sup> At the same time, it shows that seeking to implement the obligation of result embedded in the access to resources claim by means of a proportionality test based on inequalities runs the risk of delivering formal rather than substantive

<sup>183</sup> *ibid* 37 (emphasis added).

<sup>184</sup> *ibid* 49, 53.

<sup>185</sup> *ibid* 64.

<sup>186</sup> UNCLOS (n 34) art 173, para 2. The ISA study points out that 'equity requires that prior contributions by Member States [pending the envisaged ISA financial autonomy] be repaired before any distribution of revenue'. ISA (n 175) 25.

<sup>187</sup> UNCLOS (n 34) art 151, para 10, and art 160, para 2(l).

<sup>188</sup> In order to adapt the distribution algorithm to the requirements of the access to space resources claims, the revenues generated by deep seabed mining can be replaced with the revenues generated by space mining activities or, in the case of the proportional redistribution of physical resources, their monetary value.  
<sup>189</sup> As discussed in Section III.C.



equity. As this does not amount to a breach of the benefit sharing obligation, there would be no opportunity for a court of law to assess the criteria selected and the weight accorded to the particular circumstances of the case.<sup>190</sup>

Ultimately, the equitable distribution of benefits deriving from space resource activities—whether in the form of the redistribution of resources based on their monetary value or a share of monetary profit—remains both flexible and subjective and so does not fit easily with a proportionality test aimed at redressing inequalities.

### *B. Proportionality in Relation to Capacity*

The obligation of conduct contained in Article I, paragraph 1 of the Outer Space Treaty requires States to carry out their space activities ‘for the benefit and in the interests of all countries’. At the same time, State practice indicates that space activities should be informed by considerations of efficient allocation of resources and cooperation on mutually acceptable terms.<sup>191</sup> Seen from this perspective, benefit sharing should include support for capacity building in relation to space activities. Whilst not redistributive, this indirectly supports the aim of redressing inequalities.

The Outer Space Treaty does not provide any guidance on the extent to which benefit sharing must contribute to capacity building. Also, it does not indicate which State or group of States should be its beneficiaries. At the same time, seen as an obligation of conduct, the benefit sharing obligation requires States to attempt to benefit as many States as possible, but not necessarily the international community as a whole.<sup>192</sup> Likewise, at COUPUOS delegations have pointed out that benefits deriving from the conduct of space activities should take into account the interests of the parties involved in space activities<sup>193</sup> rather than the generic interest of the international community as a whole<sup>194</sup> or the States parties to the space treaties.<sup>195</sup> This raises the following questions: which interests does the benefit sharing obligation protect? And how should they be balanced through a proportionality test?<sup>196</sup>

Menter argues that the equitable sharing of benefits does not imply a redistribution of the resources exploited or a division of monetary benefits.

<sup>190</sup> Lapidoth (n 156) 178.

<sup>191</sup> As discussed in Section III.B.

<sup>192</sup> As discussed *ibid.*

<sup>193</sup> Delegations at COPUOS have pointed out that Article I, paragraph 1, of the Outer Space Treaty protects the ‘common human interest’ to ensure the fulfilment of ‘the expectation of developing countries about sharing concrete benefits’; COPUOS, UN Doc A/AC.105/457 (n 62) 12, para 50.

<sup>194</sup> UNCLOS (n 34) art 59 (recognizing that ‘taking into account the respective importance of the interests involved to the parties as well as to the international community as a whole’).

<sup>195</sup> As maintained by Menter (n 155) 232 (arguing that ‘neither mankind, nor all States are entitled to share in the benefits of exploitation. The “equitable sharing” is provided only for State Parties’).

<sup>196</sup> Reuter (n 168) (arguing that proportionality is an application of equity); Thirlway (n 113) 121 (arguing that the only function of equity in international law is to answer the question: how far or how much?).

Rather, it involves the distribution of opportunities to benefit from space activities.<sup>197</sup> This suggests that a proportionality test should aim to ensure, fairly and rationally, that all States receive adequate support to develop their own space sector. Accordingly, redistribution should promote impacts that have the potential to benefit several States and discourage those that have negative effects.<sup>198</sup> Three criteria which are well suited to facilitate this goal are reasonableness, non-detrimental effects and the maximization of benefits for the international community. They all entail an assessment of its conduct by the actor engaged in space activity.<sup>199</sup> In this respect, while indirectly contributing to the goal of welfare maximization, these criteria significantly differ from those informing the proportionality test implementing an obligation of result, as this focuses on the level of development of the recipient States. The following sections examine these three criteria in turn.

### 1. Reasonableness

When identifying the interests involved in a given space activity, the actors concerned must act with reasonableness.<sup>200</sup> This includes determining what can feasibly be shared by them (and with whom).<sup>201</sup> While discretionary, such an assessment is not arbitrary. State practice, as reflected in the work of the ILC on shared natural resources, indicates the existence of three guiding principles.

The first principle concerns the level of due diligence required of individual space actors, which depends on the latter's technological and financial capabilities. As the ICJ noted in the *Nicaragua* case, the same level of due diligence cannot be expected from States with different economies and resources available to them.<sup>202</sup> Applied to space activities, this suggests that

<sup>197</sup> Menter (n 155) 232 (referring to 'sharing "in" the benefits derived "from" the resources').

<sup>198</sup> ISA (n 175) 28.

<sup>199</sup> ILC, Draft Articles on the Law of the Non-Navigational Uses of International Watercourses, UNYBILC, vol I (1994) (International Watercourses) Commentary to Article 6, 101, para 1 (clarifying that the determination of what is equitable in a specific case requires an assessment by individual States).

<sup>200</sup> *ibid*, Draft Article 5, para 1 (requiring watercourse States to utilize the international watercourse 'in an equitable and reasonable manner'); ILC, Draft Guidelines on the Protection of the Atmosphere, UNYBILC, vol II (2021) (Protection of the Atmosphere) Guideline 6 (stating that the atmosphere should be used in an equitable and reasonable manner). See also L del Castillo-Laborde, 'Equitable Utilization of Shared Resources' in *Max Planck Encyclopedia of Public International Law* (OUP 2010) para 10 (arguing that, applied to the utilization of space resources, equity includes several principles, such as good faith).

<sup>201</sup> *Alabama Claims of the United States of America against Great Britain* (1872) 29 UN Rep Intl Arb Awards 125, 129 (acknowledging that due diligence must be exercised in exact proportion to the risks). See also EW Paxon, 'Sharing the Benefits of Outer Space Exploration: Space Law and Economic Development' (1993) 14(3) *MichJIntlL* 487, 491 ('[space actors] are under no definite obligation to share anything beyond what they think is reasonable').

<sup>202</sup> ICJ, *Military and Paramilitary Activities in and against Nicaragua* [1986] ICJ Rep 14, 85, para 157.

factors affecting the financial sustainability of a space activity, such as disbursing the investors' dividends and investing in the maintenance and upgrade of technology, form part of the considerations relating to the efficient use of resources by space actors.<sup>203</sup> The requirement applies equally to established and emerging space actors, irrespective of whether they are based in a developed or developing country.<sup>204</sup>

The second principle refines the first by requiring space actors to optimize the use of space resources. They must not only use resources efficiently, but use them only to the extent that is necessary to perform the authorized space activity.<sup>205</sup> As the Commentary to the ILC Draft Articles on Non-Navigational Uses of Watercourses clarifies, reasonableness indicates the search for the optimal use of the natural resource while preserving its sustainability and protecting the interests of all the parties involved in its uses.<sup>206</sup> Similarly, Article 44 of the International Telecommunications Union Convention establishes that, in order to ensure the equitable use of the geostationary orbit, States can reserve a segment of the orbital spectrum and related radio frequencies subject to their actual use.<sup>207</sup> Without use, such conduct would prevent other interested States from availing themselves of a limited space resource.<sup>208</sup> This means that a space actor can only occupy a spot in outer space when this is necessary in order to undertake a planned mission, both physically and temporally. It also follows that space actors must use any resources extracted for their own ends. Conversely, they cannot extract resources merely for the purposes of accumulating them, since that would deny others the opportunity to use and benefit from them.<sup>209</sup>

The third principle requires State actors to ground their decisions in relevant past practice in order to secure consistency and enhance legal certainty, while also preserving the flexibility essential for the progressive development of the

<sup>203</sup> ICJ, *Interpretation of the Agreement of 25 March 1951 between the WHO and Egypt*, Advisory Opinion [1980] ICJ Rep 73, 96, para 49 (acknowledging that 'what is reasonable and equitable in any given case must depend on its particular circumstances'). See also O Corten and R Kolb, 'Reasonableness in International Law' in *Max Planck Encyclopedia of Public International Law* (OUP 2021) para 7 ('reasonableness relates to the world of facts ... the threshold of reasonableness is always largely context-dependent').

<sup>204</sup> International Watercourses (n 199) Commentary to Article 3, 92, para 2 (stating that the determination of the optimal utilization of resources rests on the assessment of the needs of the States concerned).

<sup>205</sup> Outer Space Treaty (n 2) art VI: 'The activities of non-governmental entities in outer space ... shall require authorization and continuing supervision by the appropriate State Party to the Treaty.'

<sup>206</sup> International Watercourses (n 199) 40–63.

<sup>207</sup> Constitution and Convention of the International Telecommunication Union (adopted 22 December 1992, entered into force 1 July 1994) 1825 UNTS 331.

<sup>208</sup> De Man (n 30) 407, arguing that 'the extraction of tangible resources from celestial bodies can only be legitimate if the excavating state subsequently uses the removed substance *itself* instead of transferring it to another state' (emphasis in original).

<sup>209</sup> The scholarly literature confirms this conclusion. See *ibid* 407: 'the extraction of tangible resources from celestial bodies can only be legitimate if the excavating state subsequently uses the removed substance *itself* instead of transferring it to another state' (emphasis in original).

law. When assessing past practice, space actors must have regard to the state of development of the relevant areas of law.<sup>210</sup> For instance, space resource utilization is largely unregulated by the space treaties and no past practice exists. This unavoidably affects the perception of the due diligence standards required of space actors at any given point in time. As the ILC stated in relation to the harm deriving from hazardous activities:

What would be considered a reasonable standard of care or due diligence may change with time; what might be considered an appropriate and reasonable procedure, standard or rule at one point in time may not be considered as such at some point in the future.<sup>211</sup>

The status of space technology also affects the determination of past practice, since the level of development of the technology determines the type, quality and quantity of possible space activities.<sup>212</sup>

## 2. *Non-detrimental effects*

A proportionality test must also ensure that both the method applied and the result achieved are equitable.<sup>213</sup> This implies that, as a minimum, the space activities do not have a detrimental impact on other States.<sup>214</sup> State practice identifies two guiding principles which appear suitable for space activities.

The first is the principle of no harm.<sup>215</sup> Developed in relation to environmental issues, such as those raised by the use of transboundary resources,<sup>216</sup> it also applies to the global commons, including outer space.<sup>217</sup> It requires that States utilizing shared resources enjoy the benefits accruing therefrom while at the same time avoiding causing significant harm to other interested States.<sup>218</sup> Article IX of the Outer Space Treaty only requires that States operating in space do so ‘with due regard to the corresponding

<sup>210</sup> ICJ, *Gabčíkovo-Nagymaros Project* [1997] ICJ Rep 7 (stating that, in evaluating the level of due diligence required, the development of international environmental law—both hard and soft law—must be taken into account).

<sup>211</sup> ILC, Draft Articles on the Prevention of Transboundary Harm from Hazardous Activities, UNYBILC, vol II (2001) Commentary to Article 3, 155, para 11.

<sup>212</sup> Protection of the Atmosphere (n 200) Commentary to Guideline 3, 17, para 6.

<sup>213</sup> *Tunisia v Libyan Arab Jamahiriya* (n 143) 76, para 70 (‘The equitable nature of a principle must be assessed in the light of its usefulness for the purpose of arriving at an equitable result.’) See also *del Castillo-Laborde* (n 200) para 29 (‘The equitable utilization of shared resources is not an abstract rule but a result to be achieved. It is both the target and the process of implementation, relying on qualified specific circumstances.’)

<sup>214</sup> As also implied by the ISA test forming the conceptual template for the proportionality test based on inequalities discussed in Section IV.A.

<sup>215</sup> International Watercourses (n 199) Commentary to Article 7, 103, paras 1, 4–5 (referring to the need to avoid significant harm while reaching an equitable result as part of a due diligence obligation).

<sup>216</sup> J Brunneé, ‘*sic utere tuo alienum non laedas*’ in *Max Planck Encyclopedia of Public International Law* (OUP 2022) para 7.

<sup>217</sup> *ibid*, para 13.

<sup>218</sup> ILC, Draft Articles on the Law of Transboundary Aquifers, UNYBILC, vol II (2008) (Transboundary Aquifers) art 4, para 6.

interests of all other State Parties'. However, due diligence requirements also demand that States 'take all appropriate measures to prevent causing significant harm to [other] States'.<sup>219</sup> In the context of the use of shared resources, significant harm consists of 'something that is more than "detectable" but not necessarily "serious" or "substantial"'.<sup>220</sup> This suggests that, for example, a space mining operator (whether public or private)<sup>221</sup> must take precautions not to scatter plume or debris from its mining site over areas of a celestial body or outer space, potentially damaging the equipment of other space actors.<sup>222</sup> To that end, the space mining operator could estimate the breadth of a safety zone<sup>223</sup> and inform the UN Secretary-General and the international community of it taking such a precautionary approach.<sup>224</sup>

The second, and related, principle involves undertaking a prior assessment of the potential effect of the planned activity when the space actor has reasonable grounds for anticipating the possibility of adverse effects being caused by its activities in outer space.<sup>225</sup> What amounts to 'reasonable grounds' depends on the ability of the individual space actor to gather relevant information concerning the plans of others, based on formal notifications to the UN Secretary-General and the international community regarding the 'nature, conduct, locations and results' of space activities.<sup>226</sup> Effectively, this entails a

<sup>219</sup> Convention on the Law of Non-Navigational Uses of International Watercourses. UNGA Res 51/229 (8 July 1997) UN Doc A/RES/51/229 (Watercourses Convention) art 7(1). See also Transboundary Aquifers *ibid*, Commentary to Article 12, 35, para 2 (describing the obligation to prevent the pollution as a duty of due diligence) and *ibid*, Commentary to Article 17, 41, para 4 (describing the obligation to prevent, mitigate and eliminate any harmful effect of an emergency situation as an obligation of conduct and not of result).

<sup>220</sup> *ibid*, Commentary to Article 6, 30, para 6; International Watercourses (n 199) Commentary to Article 3, 93, para 12 (referring to the duty to prevent States being adversely affected 'to a significant extent').

<sup>221</sup> Protection of the Atmosphere (n 200) Commentary to Guideline 3, 17, para 6: 'Significant adverse effects on the atmosphere are caused, in large part, by the activities of individuals and private industries, which are not normally attributable to a State.'

<sup>222</sup> Risk-avoidance strategies also inform the practice of the submarine cable industry. See ISA, *Submarine Cables and Deep Seabed Mining: Advancing Common Interests and Addressing UNCLOS "Due Regard" Obligations*, ISA Technical Study No 14 (ISA 2015) 23.

<sup>223</sup> NASA, Lunar Landing and Operations Policy Analysis (30 September 2022) Report ID20220015973, 29–31 (describing safety zones as notification and consultation zones and detailing the recommended procedures to implement them based on the potential dangers and risks that individual space operations may cause to others).

<sup>224</sup> Outer Space Treaty (n 2) art XI: 'States Parties to the Treaty conducting activities in outer space ... agree to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities.'

<sup>225</sup> Transboundary Aquifers (n 218) Commentary to Article 15, 38, para 2. See also ITLOS (n 96) 46, para 131: 'The due diligence obligation of the Sponsoring States requires them to take all appropriate measures to prevent damage that might result from the activities of contractors that they sponsor ... where there are plausible indications of potential risks.'

<sup>226</sup> See also International Watercourses (n 199) Draft Article 12 (establishing the requirement of prior notification of planned measures).

reciprocal duty of due diligence between space actors.<sup>227</sup> In addition, read together, Articles IX and XI of the Outer Space Treaty require space actors to assess the impact of their activities on the environment of both outer space and the Earth, the latter consisting of harmful contamination resulting from the introduction of extraterrestrial matter.<sup>228</sup>

### 3. Maximization of benefits

In addition to ensuring that there are no detrimental effects on other States, space actors must also evaluate the impact of their activities on space sector capacity building in beneficiary States, with a view to achieving the maximum impact possible.<sup>229</sup> This involves a consideration of the ability of the recipient to generate widespread societal benefits from any increase in its capacity levels. For example, a space actor may decide to share the benefits deriving from its activities with one State, thus generating a significant impact on the beneficiary to the exclusion of others. However, a higher overall impact might be achieved by benefit sharing with several States, even if the benefits for any one of them is lower. Another option would be to share benefits deriving from space activities with international institutions empowered to redistribute those benefits among States lacking space capabilities. This, arguably, would produce the highest possible level of benefit sharing. To an extent, it would also contribute to the distributive justice goal of maximizing the welfare of the recipient State, flowing from benefit sharing being seen as an obligation of result.<sup>230</sup>

The ISA Technical Study provides guidance on how space actors might invest in capacity building. It states that public goods—such as marine scientific knowledge—are of interest to the international community as a whole, since global public goods benefit everybody in various degrees ‘without reducing the benefits of others’.<sup>231</sup> The rationale behind this approach is that all peoples have equal rights under UNCLOS and ‘equally benefit from the increase in scientific knowledge, capacity building and research’.<sup>232</sup>

Options for investing in public goods include the creation of a new international body. The ISA Technical Study envisions the establishment of a Seabed Sustainability Fund ‘to invest in knowledge and competence related to the Area’<sup>233</sup> as a precondition for the exploitation of the oceans’ resources, since

<sup>227</sup> See also *ibid.*, Commentary to Article 5, 98, para 11 (stating that the rights of States to use and benefit from an international watercourse are ‘equal in principle and correlative in their application’).

<sup>228</sup> See also Protection of the Atmosphere (n 200) Commentary to Guideline 4 (requiring the conduction of an environmental impact assessment with respect to proposed activities).

<sup>229</sup> International Watercourses (n 199) Commentary to Article 5, 97, para 3, stating that ‘[a] ttaining optimal utilization and benefits ... implies attaining maximum possible benefits for *all* watercourse states and achieving *the greatest possible* satisfaction of all their needs, *while minimizing the detriment to ... each*’ (emphasis added); Transboundary Aquifers (n 218) art 16(a).

<sup>230</sup> As discussed in Section IV.A. <sup>231</sup> ISA (n 175) 29. <sup>232</sup> *ibid.* 28. <sup>233</sup> *ibid.* 64.

investing in knowledge and capacity building constitutes ‘a precautionary and sustainable approach’.<sup>234</sup> In practice, the Fund would finance two main activities: research (basic, applied and innovation)<sup>235</sup> and capacity building. The latter includes basic and advanced education as well as specific technical training to be offered to all participants, including vulnerable communities, with a view to enabling them to fully understand and use the outcomes of scientific research in the oceans.<sup>236</sup>

According to the ISA Technical Study, a potential disadvantage of creating the Fund is the costs of its establishment and operation. Menter raises the same concern in relation to the equitable sharing of benefits derived from the exploitation of space resources under the Moon Agreement, which remains subject to the recovery of expenses for the creation and operation of the envisaged institutional mechanism.<sup>237</sup> The creation of a new institution for outer space would face the same administrative and financial obstacles.

While largely unsuitable for activities in the Area,<sup>238</sup> an alternative solution for the maximization of the benefits deriving from space activities is to empower existing institutions, such as the UN Programme on Space Applications (PSA).<sup>239</sup> Created in 1971, the PSA’s mandate includes the provision of capacity building, education, research and development support as well as technical advisory services with a view to reducing the gap between developed and developing countries.<sup>240</sup> A space actor offering a share of the benefits of its space activities to the PSA would be likely to maximize the impact of its doing so by allowing the international body to involve as many interested participants as possible in its work. For example, a space actor could offer a package of training on how to operate small or micro satellites, which is the form of space technology currently most in demand among developing countries.<sup>241</sup> In turn, the PSA could mobilize other administrative or financial resources in order to allow the participation of as many beneficiaries as possible,<sup>242</sup> thus maximizing the impact of the benefits

<sup>234</sup> *ibid* 64, 79 (stating that the Fund ‘would be used to invest the seabed exploitation revenue for the benefit of mankind instead of simply distributing the money. This would be a precautionary solution’).<sup>235</sup> *ibid* 64.

<sup>236</sup> *ibid* 65 (also pointing out that ‘As the seabed and its wealth are the common heritage of mankind, everybody should feel involved, or at least have the opportunity to become involved’).

<sup>237</sup> Menter (n 155) 235.

<sup>238</sup> The ISA Technical Study suggests that the Fund could be established as a tool for ISA rather than a new body. However, ISA ‘would need to scale up tremendously and develop a set of operational rules’. ISA (n 175) 69.

<sup>239</sup> PSA, Official website <[www.unoosa.org/oosa/en/ourwork/psa/index.html](http://www.unoosa.org/oosa/en/ourwork/psa/index.html)>.<sup>240</sup> *ibid*.

<sup>241</sup> COPUOS (n 84) 25, paras 148, 152 (stating that micro-satellite technologies can provide substantial benefits to countries at a lower cost than satellite technologies. Therefore, emphasis should be placed on consideration of ways and means of providing such benefits to developing countries); UNISPACEIII (n 80) 15, paras 26(e), 28(d).

<sup>242</sup> As also acknowledged in the UNISPACEIII outcome (n 80) 16, para 26(f): ‘Member States should at all times take advantage of the opportunities available through a variety of international programmes, such as the United Nations Programme on Space Applications.’

generated by individual space activities (which, in turn, are intended to have a developmental impact on the beneficiary societies).

Either way, as an intervention targeted upon capacity building in space, supporting the activities of the PSA benefits from a perceived legitimacy deriving from its contribution to the mission of a UN programme informed by sustainable development goals.<sup>243</sup> It thus directly contributes to the use of outer space ‘for the benefit and in the interests of all countries’, as set out in Article I, paragraph 1 of the Outer Space Treaty.

### *C. Implications of the Introduction of a Proportionality Test for the Progressive Development of the Law*

The formulation of a proportionality test based on capabilities within the framework of the obligation of due diligence embedded in the access to outer space claim contributes to the progressive development of the law in two main ways. Section 1 examines the specific contribution this makes to the development of international space law while Section 2 evaluates its contribution to international law more generally.

#### *1. Implications for the development of international space law*

The elaboration of a due diligence proportionality test implementing the benefit sharing obligation in Article I, paragraph 1 of the Outer Space Treaty makes a broad contribution to the progressive development of international space law in three ways. First, it introduces the concept of proportionality into international space law. Secondly, in doing so it clarifies the content and scope of benefit sharing as a normative concept. The international space law literature does not contain a generally accepted definition of benefit sharing.<sup>244</sup> Some scholars refer to it as an indeterminate obligation<sup>245</sup> whilst others describe it as an emerging principle of international law<sup>246</sup> or a moral obligation.<sup>247</sup> Conversely, the introduction of a due diligence proportionality test shows that the implementation of the obligation of benefit sharing under the Outer Space Treaty rests on the application of equitable principles which are also general principles of law—reasonableness, non-detrimental effects and

<sup>243</sup> *ibid.*

<sup>244</sup> See eg MK Simpson, ‘Benefit in Space Law: Principle and Pathway’ (2020) 2 *Air & Space Law* 143, 146.

<sup>245</sup> Paxon (n 201) 488 (‘[space actors] have only vague legal obligations to share benefits deriving from their exploitation of outer space’) and 491 (arguing that Article I of the Outer Space Treaty contains ‘an ill-defined obligation’); T Aganaba-Jeanty, ‘Introducing the Cosmopolitan Approaches to International Law (CAIL) Lens To Analyze Governance Issues as They Affect Emerging and Aspirant Space Actors’ (2016) 37 *Space Policy* 3, 5 (lamenting the indeterminate nature of the benefit sharing obligation under the Outer Space Treaty).

<sup>246</sup> E Butkevicienė and F Rabits, ‘Sharing the Benefits of Asteroid Mining’ (2022) 13 *GlobalPol* 247, 248.

<sup>247</sup> Jasentuliyana (n 5); Gorove (n 5).



TABLE 5:  
Constitutive elements of the due diligence proportionality test

Guiding principles	Criteria
Reasonableness	Impact of benefit sharing on the financial sustainability of the space activity Optimal use of available resources Assessment of relevant past practice
Non-detrimental effects	Knowledge or awareness of potentially detrimental effects caused by the space activity Objective evidence of detrimental effects
Maximization of benefits	Consideration of the capability of the recipient to generate widespread societal benefits

maximization of benefits (Table 5). Hence, it has identifiable, although flexible, core components.

Thirdly, the application of the due diligence proportionality test contributes to the development of this area of the law by providing practical and conceptual means to ensure the enforceability of benefit sharing as an obligation of due diligence by a court of law. Identified through the technique of extrapolation,<sup>248</sup> it is underpinned by principles of equity, which are general principles of law—that is to say, a formal source of international law enforceable by courts.<sup>249</sup> As the ICJ held in the *North Sea Continental Shelf* cases in relation to maritime delimitation, ‘it is precisely a rule of law that calls for the application of equitable principles’.<sup>250</sup> In practice, a breach of the due diligence obligation due to the lack of proportionality<sup>251</sup> may occur where there is unreasonableness, detrimental effects or the lack of maximization of benefits.<sup>252</sup>

In relation to unreasonableness, a breach of the obligation occurs when the space actor makes an arbitrary decision on benefit sharing—that is to say, a decision taken without evidence of the impact of benefit sharing on the financial sustainability of the space activity or the optimal use of available resources, in addition to an assessment of relevant past practice (Table 5).<sup>253</sup>

<sup>248</sup> As discussed in Section I.

<sup>249</sup> *Tunisia v Libyan Arab Jamahiriya* (n 143) 60, para 71 (‘the legal concept of equity is a general principle directly applicable as law’). See also G Schwarzenberger, ‘Equity in International Law’ (1972) YBWA 346, 352.

<sup>250</sup> *North Sea Continental Shelf* (n 154) 48, para 88.

<sup>251</sup> *ibid* 52, para 98 (acknowledging the need for a reasonable degree of proportionality in establishing the outcome).

<sup>252</sup> International Watercourses (n 199) art 7(1) (requiring States to act with due diligence); Watercourses Convention (n 219) art 7(2); International Watercourses (n 199) Commentary to Article 3, 94, para 14.

<sup>253</sup> As discussed in Section V.B.1. See also ITLOS, *The “Camouco” Case* [2000] ITLOS Rep 10, 31, para 67 (stating that the assessment of reasonableness in a given situation depends on several factors). See also O Corten, ‘The Notion of “Reasonable” in International Law: Legal Discourse,

This also means that performing an activity in outer space unaccompanied by benefit sharing does not necessarily amount to a breach of the obligation.

As regards detrimental effects, international case law suggests that a State is in breach of the obligation only if it knew or ought to have known that its space activity would be detrimental to other States (Table 5).<sup>254</sup> International practice also indicates that the detrimental effect (in the form of significant harm) must be capable of being established ‘by objective evidence’ (Table 5).<sup>255</sup> Conducting an impact assessment prior to the commencement of space activities may thus provide evidence of due diligence on the part of the space actor, especially in the event of that space activity having detrimental effects on other States. Since the burden of the proof lies with the States conducting activities,<sup>256</sup> the impact assessment may also help reduce the risk of disputes arising.<sup>257</sup> A breach of this obligation may result in reparations in the form of elimination or mitigation of the significant harm<sup>258</sup> or in the form of compensation.<sup>259</sup>

In relation to the lack of maximization of benefits, a breach of the obligation will occur when suboptimal impacts are intentional (Table 5). In practice, space actors must justify why they do not share benefits deriving from their space activities with the PSA or similar institutions.

## 2. *Contribution to the development of international law*

The introduction of a due diligence proportionality test implementing the obligation of benefit sharing under the Outer Space Treaty also contributes to international law in three ways. First, it provides a conception of benefit sharing primarily grounded in the analysis of international practice. Currently, the normative core of benefit sharing in international law builds only on selected treaty regimes, and does not include international space law.<sup>260</sup> Secondly, it strengthens the identification of two core elements of benefit sharing—namely, that benefits can be both monetary and non-monetary<sup>261</sup> and that power asymmetries influence the practical implementation of the obligation of benefit sharing.<sup>262</sup> Thirdly, the elaboration of a proportionality test aimed at producing equitable results

Reason and Contradictions’ (1999) 48 ICLQ 613, 622 (requiring evidence of a reasonable explanation).<sup>254</sup> ICJ, *Corfu Channel* (n 143) 18.

<sup>255</sup> International Watercourses (n 199) Commentary to Article 3, 94, para 14.

<sup>256</sup> *ibid.*, Commentary to Article 7, para 2, 104, para 14.

<sup>257</sup> Transboundary Aquifers (n 218) Commentary to Article 15, 38, para 5.

<sup>258</sup> *ibid.*, art 6, para 3. <sup>259</sup> *ibid.*, Commentary to Article 6, 30, para 5.

<sup>260</sup> They include: international environmental law, including biodiversity conservation, international human rights law and the law of the sea. See E Morgera, ‘The Need for an International Legal Concept of Fair and Equitable Benefit Sharing’ (2016) 27(2) EJIL 353, 356, 362.

<sup>261</sup> *ibid.* 354.

<sup>262</sup> *ibid.* 355 (‘benefit sharing is applied to relations that have different relevance under international law and are characterized by different de facto power asymmetries’).

corroborates the wider claim that benefit sharing is an operationalization of the principle of equity.<sup>263</sup>

At the same time, benefit sharing under the Outer Space Treaty departs from benefit sharing under international law more generally because it attaches to any activity conducted in outer space. Under the Outer Space Treaty, the obligation of benefit sharing is part and parcel—in a sense, the legitimating factor—of the freedom of exploration and use of outer space.<sup>264</sup> In other words, it is an inherent component of the concept of outer space as an inclusive environment. As such, it serves a purposive function requiring space actors to undertake activities in an orderly, fair and transparent manner.<sup>265</sup> It thus rejects the selective notion of triggers for benefit sharing—that is to say, the occurrences activating the benefit sharing obligation which characterize current understandings of benefit sharing.<sup>266</sup> These triggers—such as bioprospecting, the use of natural resources, the production of knowledge<sup>267</sup> and environmental conservation measures in the territories of indigenous peoples<sup>268</sup>—aim to protect the underlying values of the beneficiaries<sup>269</sup> with a view to redressing perceived injustices.<sup>270</sup> They thus serve a redistributive function by leveraging the notion of equity as the underlying normative concept.<sup>271</sup>

## VI. CONCLUSION

Advances in space technology have increased the quantity and type of commercial activities that take place in outer space. They also invite fresh thinking about the role of international law in regulating the conduct of space actors with a view to avoiding such activities having detrimental effects for the international community. Accordingly, this article has examined the scope and

<sup>263</sup> *ibid* 380 (arguing that the operationalization of equity is necessary ‘to balance competing rights and interests with a view to integrating ideas of justice into a relationship regulated by international law’). <sup>264</sup> As discussed in Section II.A.1. <sup>265</sup> As discussed in Section II.B.

<sup>266</sup> Morgera (n 260) 372.

<sup>267</sup> *ibid* 372 (‘the activities that trigger benefit sharing obligations are bioprospecting, certain natural resource use and environmental protection measures, and the production of knowledge’).

<sup>268</sup> E Morgera, ‘Benefit Sharing’ in E Orlando and L Krämer, *Encyclopedia of Environmental Law: Principles of Environmental Law* (Elgar 2017)—available as BENELEX Working Paper No 12, June 2018, Section 1; J Cabrera Medaglia and F Perron-Welch, ‘The benefit sharing Principle in International Law’ (2019) 14(1) *JIPPL* 62, 75.

<sup>269</sup> Some scholars also include the protection of indigenous peoples’ rights. See M Jaspars and AEL Brown, ‘Benefit Sharing’ in MH Nordquist and R Long, *Marine Biodiversity of Areas beyond National Jurisdiction* (Brill 2021) 97.

<sup>270</sup> Especially those suffered by vulnerable societies. See L Parks and E Morgera, ‘The Need for an Interdisciplinary Approach to Norm Diffusion: The Case of Fair and Equitable benefit sharing’ (2015) 24(3) *RECIEL* 353, 356 (arguing that ‘benefit sharing can be and has been used as a semantic sticking plaster for harmful practices ... and even to rubber stamp inequitable and non-participatory outcomes that benefit “stronger” parties’).

<sup>271</sup> E Morgera, ‘Under the Radar: The Role of Fair and Equitable benefit sharing in Protecting and Realising Human Rights Connected to Natural Resources’ (2019) 23(7) *IntJHumRts* 1098, 1116–18.

content of the benefit sharing obligation set forth in Article I, paragraph 1 of the Outer Space Treaty. The findings show that State practice currently supports two different understandings of that obligation, demonstrating that the concept of benefit sharing is not static.

Some States focus on access to space resources, and as a result argue that benefit sharing is an obligation of result that seeks to redistribute resources extracted equitably and which brings about distributive justice. However, in the absence of equitable sharing criteria, such an understanding of the benefit sharing obligation turns out to be difficult to implement and, ultimately, not enforceable by a court of law.

Others place their focus on access to outer space and consider benefit sharing to be an obligation of conduct. Governed by due diligence principles, it provides guidance on how to conduct activities in space with due regard for the interests of other States, including those lacking the means to conduct such activities themselves. As an obligation of conduct, it focuses on the actions of space actors rather than the characteristics of its beneficiaries. In practice, this makes the content of the obligation dependent upon the assessment of the space actor, who determines what they consider to amount to appropriate benefit sharing relative to the risks and circumstances associated with their activities.

To better operationalize the duty of due diligence which is embedded in the access to outer space claim, this article has argued from the adoption of an original proportionality test which can be used to determine the equitable amount of benefit sharing which is due to the international community. Grounded on equitable principles which are also general principles of law, the proportionality test makes benefit sharing under the Outer Space Treaty an obligation enforceable by a court of law. It thus introduces a novel legal construct to international space law. In addition to facilitating the progressive development of international space law, the elaboration of this due diligence proportionality test also enriches the understanding of the obligation of benefit sharing under international law more generally.