Common but Differentiated Responsibility for Space Debris: Using Equitable Principles to Incentivise Debris Mitigation

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Abstract

Over the years, a small number of states have created the vast majority of space debris in orbit around the Earth. This growing population of space debris has led to an increase in the costs of operations for all actors, many of whom are only beginning their space programs and have not gained any benefits from the pollution of outer space; yet they are forced to bear the costs. This paper discusses how the foundational principles of space law incorporate the spirit of Common but Differentiated Responsibilities (hereinafter CBDR) and show how it applies to questions of active and passive debris mitigation and liability for damage caused by space debris. This would be done by holding the chief polluters collectively responsible for damage caused to states who have not contributed to the debris population in any meaningful way so long as the latter complies with the debris mitigation norms.

1. Introduction

The US, Russia, and China account 94% of the space debris in orbit around the Earth.[1] This debris is repeatedly becoming a more serious problem, disrupting launch schedules,[2] necessitating evasive manoeuvres,[3] and increasing the risks and costs of space operations. While these few states have

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1 *See* NASA, 25.1 Orbital Debris Quarterly News 12, (2021) (as of 05 January 2021, catalogued by the U.S. Space Surveillance Network).

2 *See* PSLV C-32 Launch Time Delayed by One Minute to Avoid Space Debris, The Econ. Times (Mar. 10, 2016), https://economictimes.indiatimes.com/news/science/pslv-c-32-launch-time- delayed-by-one-minute-to-avoid-space-debris/articleshow/51347118.cms; see also ISRO's PSLV-C23 carrying French, German satellites successfully launched, The Economic Times (Jun. 30, 2014) https://economictimes.indiatimes.com/news/politics-and-nation/isros-pslv-c23-carrying-french-german-satellites-successfully- launched/articleshow/37507248.cms.

3 NASA, 26.1 Orbital Debris Quarterly News 6, (2022).

reaped the benefits of space exploration over the years, the risks from the resultant debris and the costs in mitigating it are being borne by many states who have not shared in these benefits.

Space law from its inception has incorporated ideas of equity between developed and developing states. This paper will show how the Principle of Common but Differentiated Responsibility will help enact these ideas of equity. The first chapter defines space debris and the CBDR principle. The next chapter will show how the principles which underly the CBDR Principle are implicit in the existing space law regime. The third chapter will discuss the implementation of the CBDR principle to the questions of liability for damage caused by space debris, debris mitigation, and active debris removal using principles found in the Outer Space Treaty,[4] Liability Convention,[5] and the Rescue Agreement.[6] The final chapter will provide concrete suggestions for a CBDR Principle based framework for debris mitigation, active debris removal as well as for the liability related to space debris.

2. Definitions and Context

2.1. Space Debris

The existing space treaties provide no definition of space debris. In fact, there is little clarity over the definition of 'space object', a term which is essential to conceptualising space debris.

The Liability Convention defines a space object as "*component parts of a space object as well as its launch vehicle and parts thereof*".[7] The phrase 'component parts' has been understood to refer to parts of a space object which facilitate the objective of launch or are conducive to the "useful operation" of the space object.[8] Debris, on the other hand, generally implies something that is broken up[9] and is a hard thing to define. One of the attempts is the functional definition, which argues that the characteristic

4 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, entered into force Oct. 10, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter 'Outer Space Treaty'].

5 Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention].

6 Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter ARRA].

7 Liability Convention, supra note 5, art. I(d); *see also* Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15, I(b) [hereinafter Registration Convention].

8 *See* HE Qizhi, Review of Definitional Issues in Space Law in Light of Development of Space Activities, 34 Proc. On L. Outer Space 32, 35 (1991).

9 I. H. Ph. Diederiks-Verschoor, Harm Producing Events Caused by Fragments of Space Objects (Debris), 25 Proc. On L. Outer Space 1, 1 (1983).

attribute of space debris is non-functionality.[10] This functionality-based approach was summarised in the UNCOOPUOS Guidelines on Debris Mitigation as "all man-made objects, including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional."[11]

However, Lubos Perek has argued that a non-functional object may still retain value for the launching state due to the technology or information it carries.[12] This nuance is preserved by the definition suggested by the International Law Association (ILA), wherein space debris includes "man-made objects which are non-functional and not useful, and in whose condition no change is to be reasonable expected.".[13] This will be the definition for the purposes of this paper.

2.2. The Principle of Common but Differentiated Responsibility

Principle Seven of the Rio Declaration states "States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."[14]

There are two parts to this principle – the first accepts that that all states have a *common responsibility* to "conserve, protect and restore" the Earth's ecosystem. This is self-evident within the context of the Rio Declaration, where the subject of common responsibility is planet Earth, but when applying the CBDR principle to any other context, it would be important to establish the reasons for states to have common responsibility in the first place. The second part of this principle is the *differentiated responsibilities*. The reasons for these are twofold: the first is responsibility, since they have caused, and in most cases continue to cause, more damage to the environment in question. The second reason is capability, since these states are financially and technologically more capable of contributing to the conservation, protection and restoration of the concerned environment.

10 *See* Lubos Perek, Technical Aspects of the Control of Space Debris 33 Proc. On L. Outer Space 400 (1991).

11 Comm. on the Peaceful Uses of Outer Space, Scientific and Technical Subcomm. Forty-Third Session, Progress Rep. of the Working Group on Space Debris, U.N. Doc. A/AC.105/C.1/L.284, at 3–5 (2006) [hereinafter UNCOPUOS Guidelines].

12 *See* Lubos Perek, Management Issues Concerning Space Debris, Proceedings of the 4th European Conference on Space Debris 587, 588 (2005).

13 Space Law Committee, 66 Int'l L. Ass'n Rep. Conf. 305, 325 (1994) [hereinafter ILA Draft Instrument on Space Debris].

14 Rio Declaration on Environment and Development, June 14, 1992, 31 ILM 874 (1992).

The CBDR Principle also finds a place in the UN Framework Convention of Climate Change ("UNFCCC"), which acknowledges the differences in both capabilities and socio-economic conditions of the member states.[15] In addition to delineating countries which have greater responsibility, the UNFCCC also enumerated the countries whose interests require greater protection due to their developmental status or particular vulnerability to climate change. The Convention established the importance of financial assistance and protecting the rights of certain groups of states in addition to the implicit understanding of a differentiated responsibility to take action.

The Paris Agreement also recognises the CBDR Principle,[16] implementing differentiated responsibilities for developed, developing and least developed countries. It is also agreed that developed countries will provide financial aid[17] and support for building capacities to take effective climate change action.[18] One of the means for achieving this is the concept of 'internationally transferred mitigation outcomes', which will incentivise states with greater financial resources to financially assist climate mitigation projects in less capable countries.[19]

The CBDR Principle is clearly embedded in international law pertaining to climate change, the next part will show how these principles also apply to the problem of space debris.

2.3. Applicability of CBDR Principle to Space Debris

The first element of the CBDR Principle is common responsibility. While outer space is vast, access to it can be seen as a public good which is endangered by space debris. The UN General Assembly Declaration of Legal Principles Governing the Activities of States in the exploration and use of Outer Space (hereinafter the '1963 Declaration')[20] stated that exploration and use of outer space shall be carried out for the benefit of all mankind. This was later enshrined in the Outer Space Treaty which designated the exploration and use of outer space as the province of all mankind.[21] This principle extends beyond the Outer Space Treaty, finding acceptance of the

15 United Nations Framework Convention on Climate Change, May 9, 1992, S. Treaty Doc. No. 102-38 [hereinafter UNFCCC], Preamble.
16 Paris Agreement to the United Nations Framework Convention on Climate Change, Dec. 12, 2015, T.I.A.S. No. 16-1104 [hereinafter 'Paris Agreement'].
17 *Ibid*, at 9.
18 *Ibid*, at 11.
19 *Ibid*, at 6.
20 G.A. Res. 18 (1962) Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (Dec. 13, 1963) [hereinafter 1963 Declaration].
21 *See* Outer Space Treaty *supra* note 5, at I.

UN General Assembly as part of two unanimously passed resolutions of the UN General Assembly.[22]

Having established the common responsibility of states to protect exploration and use of outer space, we need to look at why different states bear differentiated responsibilities. Just three spacefaring states contribute 90% of the spacecraft in orbit around the Earth and also contribute to 94% of space debris.[23]

The problem of space debris on the other hand affects all spacefaring states, increasing costs of operations by forcing them to engage in collision avoidance and debris tracking and detection.[24] Thus, while the benefits of space development accrued to a limited number of states, the cost of such development have to be borne by all states which intend to join the space age. This reflects the first reasoning for differentiated responsibility – the outsized role of a certain countries in causing the adverse environmental impact.

The second reasoning for differentiated responsibility is a difference in capabilities to mitigate the pollution in question. Countries with the greatest number of space objects in orbit have gained greater technical capabilities as a result of greater experience in space exploration. Moreover, launching space objects has become a lucrative business, and states have gained financially from development of their space capabilities at the risk of creating more space debris.

3. CBDR and Related Principles in Space Law

3.1. Normative Principles

Article I of the Outer Space Treaty pointedly mentions that exploration and use of outer space shall be carried out keeping in mind all countries, "*irrespective of their economic or scientific development*".[25] Article IX of the treaty further requires the state parties to avoid 'harmful contamination' of outer space during their activities therein.[26]

In 1996, the UN General Assembly passed the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.[27] This declaration further elaborates on the principles

22 G.A. Res. 51/122, Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (Feb. 4, 1997) [hereinafter 1996 Declaration]; also see 1963 Declaration *supra* note 25.

23 NASA, *supra* note 1.

24 *See* Lotta Vikari, The Environmental Element In Space Law 40 (Frans G. von der Dunk ed., 2008).

25 Outer Space Treaty, *supra* note 4 art I.

26 Outer Space Treaty, *supra* note 4 art IX.

27 *See* 1996 Declaration, *supra* note 22.

enshrined in the Outer Space Treaty. It specifically mentions the needs of developing countries and emphasises the need to keep their needs in mind in the exploration and use of outer space. Paragraph three of the 1996 Declaration specifically creates a greater responsibility on states with greater 'space capabilities' to foster international cooperation in the spirit of equity.[28] The principle of CBDR has also been expressed in the views of states in the Legal Subcommittee of the United States Committee for Peaceful Uses of Outer Space, where the view was expressed that 1) the states whose activities created space debris should be responsible for mitigation, and 2) that these arrangements should not create obstacles for future space activities of developing countries.[29]

3.2. Liability Convention

The Liability Convention provides for two different regimes regarding liability for damage caused by a state's space objects. Launching states are absolutely liable for damage caused by their space objects on the surface of the Earth or to aircraft in flight.[30] For damage caused elsewhere, the launching state is only liable if damage is caused due to its fault (or the fault of persons for whom it is responsible under law).[31]

The travaux préparatoires for the Liability Convention explain that damage in space is caused to another spacefaring state, which has assumed the risks borne out of activities in outer space. Damage caused on the surface or airspace of Earth, on the other hand, is inflicted on an unsuspecting party which did not benefit from space activities.[32] This equitable distinction between different victims is not unlike the distinction at the heart of the CBDR Principle, even though the distinction here is based on assumption of risk rather than stages of economic or technological development.

However, the question of risk assumption is much more complex today than it was in 1972; in the early years of space exploration, the risk assumed by a launching state was much lower. With the smaller population of space objects at the time, questions of liability were limited to damage caused by space objects whose launching states could be ascertained. There was no mention of general environmental damage, nor any discussion on damage caused by objects whose launching state cannot be ascertained, both of which are issues which arise when dealing with space debris. States who have yet to undertake significant space exploration and use are forced to assume the risk of unidentified space debris. This debris may have been created by other

28 *See* 1996 Declaration, *supra* note 22, at I.

29 *See* Comm. On the Peaceful Uses of Outer Space, Rep. of the Legal Subcomm. on its Forty-Sixth Session, U.N. Doc. A/AC.105/891 (2007).

30 Liability Convention, *supra* note 5, art. II.

31 Liability Convention, *supra* note 5, art. III.

32 *See* 89 U.N GAOR, Rep. of the Comm. on Peaceful Uses of Outer Space, 7th Sess., UN Doc. A/AC.105/C.2/SR.94 (Jun. 4, 1968).

launching states unintentionally or intentionally (by testing an anti-satellite weapon), but since the pieces cannot be attributed to a particular launching state, the damage caused by them is uncompensated, running against the victim-centric focus of the Liability Convention[33] as well as imposing undue risk on all states which want to start conducting space activities.

3.3. Non-Appropriation and Perpetual Ownership

Article II of the Outer Space Treaty provides the non-appropriation principle, which states that outer space, including moon and other celestial bodies is not subject to appropriation, including by means of "use, occupation, or by any other means."[34]

Article VIII of the Outer Space Treaty provides that states retain jurisdiction and over objects on their registry in outer space. Ownership of the object is not affected by its presence in outer space, on any celestial body, nor by its return to Earth.[35] This precludes any interference, including re-orbiting and de-orbiting, by another state.

This means that in absence of debris removal conducted by this state of registry, space debris will occupy an orbit and deny it to all states other than the state of registry, much like a 'place-saving object'. This would constitute a violation of the Art. II of the Outer Space Treaty.[36]

Since a few states have created most of the space in orbit around the Earth, it falls to reason that they will have to remove it in order to comply with the Outer Space Treaty. The difference in responsibility between states in active removal of these objects is clear from the huge disparity in the quantity of debris created by different groups of states, with just three states being responsible for 94% of debris around the Earth.[37]

4. Implementing the CBDR Principle to Space Debris

The previous chapter showed how existing international space law contains the same basic principles as the CBDR Principle but falls short of implementing the principle to its full extent. This leaves glaring gaps in space law concerning space debris, which can only be filled by a proper implementation of the CBDR Principle.

Many state members of the UNCOPUOS have recognised this and have repeatedly advocated for some variation of the principle since 2001.[38] In

33 *See* Liability Convention, *supra* note 6, Preamble.
34 Outer Space Treaty, *supra* note 4, art. II.
35 Outer Space Treaty, *supra* note 4, art. VIII.
36 P.M Sterns. and L.I. Tennen, Orbital Sprawl, Space Debris and The Geostationary Ring 6.3 Space Policy, 221 (1990).
37 NASA, *supra* note 1.
38 Peter Stubbe, Common but Differentiated Responsibilities for Space Debris – New Impetus for a Legal Appraisal of Outer Space Pollution, 31 ESPI Perspectives 1 (2010).

2022, delegates to the Legal Subcommittee of the UNCOPUOS reiterated the importance of the CBDR Principle in space debris remediation.[39] Suggestions included calls for greater involvement of states most responsible for debris remediation as well as calls for these states to share their scientific and legal expertise with less developed states.[40] Delegates also suggested the creation of an international fund to aid coordinated efforts to remove space debris, and contribution to this fund should be based on roles of different states in creating space debris.[41] Furthermore, debris remediation should not impose unnecessary burdens on developing countries and non-spacefaring states, who must be given access to scientific and legal knowledge to facilitate their implementation of debris mitigation guidelines.[42]

While not binding, these views expressed by members of the UNCOPUOS point to the principles which should inform any framework for implementing CBDR for space debris. This will be tackled in three sections: debris mitigation, active debris removal, and liability for damage by space debris.

4.1. Debris Mitigation

Space debris mitigation measures are the measures designed to conduct space missions in such a way as to minimise the creation of space debris. The Debris Mitigation Guidelines created by the Inter-Agency Space Debris Coordination Committee (IADC) (hereinafter IADC Guidelines) provide a set of practices which are agreed upon by the national space agencies of leading spacefaring states. These guidelines are non-binding but have been accepted by the UN General Assembly as reflecting "existing practices as developed by a number of national and international organizations."[43] Debris mitigation guidelines are growing into soft law, i.e., an international law norm which while non-binding, has significant normative value and affects state actions.[44]

The IADC Guidelines impose obligations with regard to the design of space objects and planning of missions.[45] These measures are necessitated due to the creation of space debris by a small number of states, but disproportionately affects developing states, since they have to bear the cost and develop the expertise for these measures earlier on in the life of their space programs.

39 Comm. On the Peaceful Uses of Outer Space, Rep. of the Legal Subcomm. on its Sixty-First Session, U.N. Doc. A/AC.105/1260 para 139 (2022).
40 *Ibid.*
41 *Ibid*, at 140.
42 *Ibid*, at 141-145.
43 G.A. Res. 62/217, at 7 (Dec. 22, 2007).
44 Alan Boyle, Soft Law in International Law Making, in International Law 120 (Malcolm D. Evans ed., 2010).
45 IADC Space Debris Mitigation Guidelines, at guideline 5.2.1, IADC-02-01 Rev. 3 (June 2021).

In 2007, Dr. M.Y.S. Prasad and Dr. Rajeev Lochan discussed implementing the CBDR Principle to solve the problem of space debris. They based their suggestions on the Kyoto Protocol and suggested: 1) Launch quota caps based on historic debris generation, 2) a system of 'debris credits' earned for debris mitigation, tradeable in an approach broadly similar to carbon credits in the Kyoto Protocol, and 3) states engaging in technology and knowledge transfers be given preferential treatment and allowed to gain debris credits through 'Joint Implementation Mechanisms'.[46] Peter Stubbe (2010), however, has argued against any lowering of debris mitigation standards for developing countries, since the only way to solve the problem of space debris is for all states to adopt debris mitigation measures.[47] The suggestion of launch quota caps also conflicts with the principle that space shall be free for exploration and use "without discrimination of any kind" as enshrined in the Outer Space Treaty.

Any suggestions for common but differentiated responsibilities in debris mitigation need to account for the fact that these measures make space operations more difficult, both financially and technically. Measures under the CBDR Principle should incentivise and enable developing states to adopt these expensive measures.

4.2. Liability for Damage Caused by Space Debris

As seen above, the Liability convention is victim centric, focused on ensuring compensation to states who have suffered damage from space objects. The Liability Convention distinguishes between victim states based solely on whether the damage was caused in outer space or on Earth.[48] Any distinction based on a state's developmental status or its role in the creation of space debris will not affect the claims of said state under the Liability Convention.

In order to ensure that the victim is compensated, the Liability Convention contains provisions for joint and several liability for joint launching states.[49] This concept extends beyond missions which have multiple launching states. According to Art. IV, if damage is caused by a space object of State 1 to a space object of State 2 'elsewhere than on the surface of the Earth' and this further results in damage to State 3, then State 1 and State 2 are jointly and severally liable for damage caused to State 3.[50] With regard to space debris, this would also mean that if a state's space object suffers damage from space debris and this damage further causes damage to a third state, State 2 would

46 Dr. M. Y. S. Prasad, Dr. Rajeev Lochan, Common but Differentiated Responsibility – A Principle to Maintain Space Environment with Respect Space Debris, 50 Proc. On L. Outer Space 284 (2007).

47 Stubbe, *supra* note 38, at 10.

48 Liability Convention, *supra* note 6, arts II & III.

49 Liability Convention, *supra* note 6, art V.

50 Liability Convention, *supra* note 6, art IV.

be liable to pay compensation for the damage caused to State 3 despite being an uncompensated victim.

This, coupled with the difficulty in establishing fault for unattributable debris, shows the inadequacy of the current liability regime to address space debris. Lawrence D. Roberts points out that a liability-based regime is ineffective when most damage cannot be traced back to specific parties and suggests a 'Liability Pool' with mandatory contributions from space actors based on the risk assessment of every mission.[51] M.Y.S. Prasad and Rajeev Lochan suggest the creation of a 'Trust Fund' to compensate victims of damage from space debris, contributions to which would be linked to historic debris creation.[52] Lotta Vikari suggests insurance as a market based measure to ensure that victims are compensated. She also refers to the three-tiered framework employed by the IAEA's Vienna Convention on Civil Liability for Nuclear Damage, the cost being borne first by the individual or organisation conducting the activity, then the state responsible for said activity, and finally an international fund. [53]

All these approaches can help guide a CBDR based approach to the question of liability. It is important to distinguish between debris created before and after the implementation of the IADC Guidelines. This provides a point of departure for establishing joint liability for damage caused by space debris, with debris creation resulting from violation of these guidelines being treated differently from debris created before it. Since states responsible for creation of debris were effectively the 'joint launching states' of space debris, holding them collectively liable for debris created before the guidelines is in consonance with the principles of equity underlying the Liability Convention.

4.3. Active Debris Removal

Active Debris Removal (ADR) refers to the re-orbiting or de-orbiting of space debris to avoid contamination of orbits. Since space debris is by definition non-functional, external measures would be required to de-orbit or re-orbit it.

The Principle of Non-Appropriation combined with the rights of states under Article VIII of the Outer Space Treaty implies a duty on part of states who have placed the most space debris in orbit to remove said debris. The rights of jurisdiction, control, and ownership under Article VIII are attached to state responsibility under Article VI as well as compliance with international law under Article III.[54] Whereas debris mitigation measures need to be carried

51 *See* Lawrence D. Roberts, *Addressing the Problem of Orbital Space Debris: Combining International Regulatory and Liability Regimes*, 15 B.C. Int'l & Comp. L. Rev. 51 (1992).

52 Prasad & Lochan, Common but Differentiated Responsibility, *supra* note 52.

53 *See* Vikari, *supra* note 24, at 194.

54 Joyeeta Chaterjee, Legal Issues Relating to Unauthorised Space Debris Remediation, 65 Proc. On L. Outer Space (2014).

out by all states engaging in space activities, removal of space debris is primarily the responsibility of the states responsible for debris creation.
A framework for ADR based on CBDR is required to solve two issues: 1) the rights of states to remove debris not owned by them. 2) the duty of various states to remove unattributable space debris.
Under the definition of space debris used in this paper, it is inactive, "not useful", and no change can be expected in its condition. These decisions, especially relating to usefulness, can only be taken by an object's state of registry.[55] Once these objects are no longer functional or useful, they will be designated as space debris and taken outside the ambit of command, control and ownership under Article VIII. This debris would instead be considered 'harmful contamination' under article IX of the Outer Space Treaty,[56] and all states would have the right to remove such debris. Fragmentary space debris whose ownership cannot be traced to any state is largely free from such restrictions over removal, being considered similar to 'flotsam and jetsam' in international maritime law, and subject to removal or destruction without any legal consequences.[57]
With regard to a duty to remove space debris, authors like Nicol Svárovská and V. Gopalakrishman et al. recommend using CBDR Principles without imposing excessive burdens on any group of states. Gopalakrishman et al. apply the suggestions proposed by M. Y. S. Prasad and Rajeev Lochan such as a 'Trust Fund' and 'Debris Credits' and apply them to ADR. The Trust fund would financially aid and enable ADR, while Debris credits would be issued for debris removal, development of technology for ADR, and implementation of debris mitigation guidelines.[58]

55 V. Gopalakrishman & M.Y.S. Prasad, Space Debris Remediation - Common but Differentiated Responsibility, 56 Proc. Int'l Inst. Space L. 379 (2013).
56 Wayne N. White, Jr, Salvage Law for Outer Space, in Engineering, Construction, And Operations in Space III, Space '92, Proceedings of The Third International Conference (1992). (Quoting Wanland, 1985 as in turn quoting Blackwall).
57 Gordon Chung, Jurisdiction and Control Aspects of Space Debris Removal, in Space Security and Legal Aspects of Active Debris Removal. (Annette Froehlich ed. 2019).
58 Gopalakrishman & Prasad, *supra* note 61, at 393.

5. Conclusion

Based on the observations in the previous chapter, a framework for implementing CBDR to space debris mitigation, liability and remediation should have the following features:

- A framework similar to the 'Technology Mechanism' set up in the UNFCCC should be set up to facilitate the transfer technical capabilities from states possessing technical capabilities to implement the IADC Guidelines to states which require such capabilities.
- A distinction should be drawn between debris created before the framing of the debris mitigation guidelines such as IADC Guidelines and debris created after. The first category would be the collective responsibility of states who have had a major role in its creation.
- A 'Space Debris Fund' should be created from state contributions based on their role in creation of space debris.
- Part of the Space Debris Fund shall be used to aid less developed states in implementing the debris mitigation guidelines.
- Space operations after the framing of IADC Guidelines should be judged on their compliance with these guidelines; states should have to contribute to the Space Debris Fund for debris creation caused by violation of these guidelines.
- The Space Debris Fund should also be used to pay compensation for damage caused by space debris.
- States will have the option to abandon space objects which have become non-functional and are no longer useful. These shall be designated as space debris and would be subject to removal and salvage by other states. The registering state would surrender its rights under Article VIII and in turn would not be liable for damage caused by it so long as it has complied with debris mitigation guidelines.
- A developed state refusing to acquiesce for removal of its inactive space object should be held liable not only for any damage caused to the active space objects of another state, but also for any damage caused to a third state as a consequence of such damage.
- The active removal of space debris should be the responsibility of states who have had a greater role in creating space debris. This can be enacted directly or through salvage operations which are financially supported by the developed nations.
- Developed states in context of outer space activities should aid less developed states financially and technically in developing capabilities to conduct debris removal in order to protect their space objects where necessary.