

Building upon the Developments in the Law of the Sea: The Extension of the Concept of Sustainable Development to Outer Space

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Abstract

The current legal regime regulating activities in outer space does not provide for rules capable of handling the complex process of developing the mining industry in outer space. This article proposes extending the concept of sustainable development to the domain of outer space. The application of sustainable development to outer space can be better understood in light of developments that have taken place in the law of the sea, particularly developments associated with the concept of the common heritage of mankind, which is believed to be at the heart of sustainable development when it comes to the governance of common spaces. The experiences learned while drafting Part XI of the UNCLOS and its subsequent amendment by the 1994 Agreement provide necessary insight into the drafting process, which can help identify possible obstacles and serve as a model to follow while developing space law.

Keywords

sustainable development, law of the sea, outer space law, common heritage of mankind, natural resources, province of mankind

1. Introduction

We are on the eve of expanding the mining industry into outer space. At the moment, there are no legal rules capable of handling the reality of the complex process of industrialisation of outer space. Current space law is an important and valuable set of general principles that ensures the peaceful use and exploration of space: it safeguards space from military uses and nuclear weapons, it guarantees the freedoms of use and exploration, and establishes basic rules for cooperation, responsibility and liability in outer space.² But it is a general body of law that needs further development through its *lex*

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² For the rules on military uses, nuclear weapon, guarantees on the freedoms of use, responsibility and cooperation, see Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (adopted 27 January 1967, entered into force 10 October 1967) 610 UNTS 205 (Outer Space Treaty, OST); for liability rules, see Convention on International Liability for Damages Caused by Space Objects (adopted 29 March 1972, entered into force 1 September 1972) 961 UNTS 187 (Liability Convention).



specialis.³ Space law was created at the very beginning of the space era that began with the launch of Sputnik 1 in 1957. It was drafted in a way that allowed for the important fundamentals to be laid down, while also being general enough to encompass future developments. Since then, outer space has developed from a 'two party club' (the United States and the Soviet Union) into a widespread activity with various types of stakeholders.⁴ The commercialization of space and future expansion of the mining industry into space raises many questions, such as those concerned with governance of resources, distribution of benefits and environmental impact. Space law, as created at the height of the Cold War, on one hand reflects the fears of opening up a new field for military competition and, on the other hand, the excitement relating to space exploration.⁵ It does not account for the problems that became evident with passing time, like the proliferation of space debris. The laissez-faire approach has contributed greatly to the extensive pollution of Earth orbits to the point that most of the objects in the orbits are now space debris, which endanger functioning satellites and can lead to the so-called 'Kessler syndrome'.⁶ As we now know, the reaction of the international community in terms of legal regulation of the space debris issue was not timely enough. Space law, which is practically void of any clear rule concerning environmental issues,⁷ was not able to influence the conduct of states so as to prevent pollution of orbits, and space debris therefore proliferated.

In order to better handle the issue of the expansion of the mining industry into space, the creation of new rules is necessary: first, in order to manage the resources; and, second, to avoid possible environmental problems, which cannot be accurately predicted at the present time. To this end, a fine balance between regulating non-existing activities and doing it too late must be struck. The Moon Agreement provides that states 'undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is

3 For this purpose *lex specialis* is understood as 'a particular rule [that] may be considered an application of a general standard in a given circumstance' within the same particular international legal regime [Martti Koskenniemi, *Report of the Study Group on the Fragmentation of International Law* (2006) 49].

4 For the expanding spectrum of stakeholders in the space sector, see Gabriel Lafferranderie and Daphné Crowther (eds), *Outlook on Space Law over the Next 30 Years* (Kluwer Law International 1997) 21-64; Lotta Viikari, *The Environmental Element in Space Law: Assessing the Present and Charting the Future* (Martinus Nijhoff 2008) 21-28. On the commercial use of outer space and legal implications, see Isabella Henrietta Ph Diederiks-Verschoor and Vladimír Kopal, *An Introduction to Space Law* (Kluwer Law International 2008) 106-21. On the diversification of actors and stakeholders, and its impacts on outer space law see, eg, Ingo Baumann, 'Diversification of Space Law' in Marietta Benkö and Kai-Uwe Schrogl (eds), *Space Law: Current Problems and Perspectives for Future Regulation*, vol. 2 (Eleven International Publishing 2005) 49.

5 See Joanne Irene Gabrynowicz, 'Space Law: Its Cold War Origins and Challenges in the Era of Globalization' (2004) 37 *Suffolk University Law Review* 1041.

6 See Donald J Kessler and Burton G Cour-Palais, 'Collision Frequency of Artificial Satellites: The Creation of a Debris Belt' (1978) 83:A6 *Journal of Geophysical Research* 2637, 2656. The authors demonstrated a direct correlation between the growing number of objects in orbit and the number of collisions between such objects. Through mathematical modelling, they portended that 'the debris flux will increase exponentially with time' even without any new launches.

7 The Moon Agreement, the most relevant international treaty from the environmental standpoint, has not been signed by any space powers [Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (adopted 18 December 1979, entered into force 11 July 1984) 1363 UNTS 3 (Moon Agreement)]. As of 15 January 2015, it enjoys 16 ratification and 4 signatures, see <www.unoosa.org/pdf/limited/c2/AC105_C2_2015_CRP08E.pdf> accessed 25 June 2015.



about to become feasible⁸. Thus far, mining of the Moon is not feasible; therefore, the development of specific rules at this stage would mean regulation of a non-existent activity. Such law would have little chance to endure. Nevertheless, the concept of sustainable development is flexible enough to become part of today's space law. Its role would not be to strictly regulate future mining of space resources, but rather to set it up in light of the integration of economic, social and environmental values. The application of sustainable development would help shape future state practice according to agreed upon values and would prevent the establishment of state practice driven by unilateral interests.

The process of adopting the concept of sustainable development to outer space could borrow from the solutions already present in the legal regime for sustainable use and protection of the seas. In general terms, the problems related to the use and exploration of the seas and outer space are very much alike. Many analogies between the legal regimes of the seas and outer space can be drawn, in particular with respect to their legal statuses, use of resources or environmental protection. Yet legal responses provided by the two regimes differ in many ways. While the applicable space law only touches on the issues at a generic level or suggests further legal developments, the law of the sea has already addressed them on a far more specific level. The United Nations Convention on the Law of the Sea (UNCLOS)⁹ has adopted the modern concept of sustainable development and linked to it the concept of the common heritage of mankind (CHM),¹⁰ designed to achieve sustainability in common spaces. The attempt to introduce the CHM concept to space law via the Moon Agreement¹¹ has not been met with political acceptance, which was reflected in the low number of ratifications.¹² The lessons from the processes behind the adoption of the UNCLOS and the subsequent 1994 Implementation Agreement¹³ could help facilitate the extension of sustainable development to outer space, in order to establish an effective regime for the managements of resources and environmental protection.

However, sustainable development carries with it issues and problems that have enveloped the concept over the years. These tend to be associated with the indeterminacy of sustainable development and uncertainty of its normative status.

This article postulates the extension of the concept of sustainable development to the domain of outer space. It briefly analyses various interconnections between the seas and outer space. It then introduces the concept of sustainable development in order to determine the legal grounds for its adoption. In order to determine the feasibility of the extension and the rationale behind it, as well as

8 Moon Agreement, art 11(5).

9 United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3 (UNCLOS).

10 The UNCLOS does not use the actual phrase 'sustainable development', but it incorporates all elements of sustainable development [Jonas Ebbesson and others (eds), *International Law and Changing Perceptions of Security* (Koninklijke Brill 2014) 196]; Part XI of the UNCLOS provides for rules relating to the CHM.

11 Moon Agreement, art 11.

12 Moon Agreement, art 11.

13 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (adopted 28 July 1994, entered into force 16 November 1994) 1836 UNTS 3 (Implementation Agreement).



to anticipate obstacles and possible solutions, the analysis turns to the developmental process of the law of the sea, in particular the evolution of the concept of the common heritage of mankind.

2. The importance of recognising the integration of natural and man-made systems

The Preamble to the UNCLOS recognises that ‘the problems of ocean space are closely interrelated and need to be considered as a whole.’¹⁴ This formal acknowledgement of the unity of concerns within the marine sphere is actually a first step towards a holistic approach to problems of ocean, land, air and outer space.¹⁵ Because these systems are parts of one natural system that also integrates human-made systems, the environmental concerns, as well as the economic and social issues arising from their use, are inseparable. Subsequently, the development of regulatory regimes must strive for improved systemic integration, which reflects the integration of natural and man-made systems.¹⁶ The concept of sustainable development is a holistic approach that accounts for the unity of natural systems; it also integrates them with the human-made economic and social systems.¹⁷ Such a holistic approach helps to integrate conflicting values and can serve as an auxiliary means of achieving systemic integrity of international law.¹⁸

The recognition of integration of the systems under the umbrella of sustainable development is an important characteristic of the changes introduced to the law of the sea by the UNCLOS. The embracement of sustainable development and its legal instruments¹⁹ by space law can be better understood and accepted in light of the changes proposed by the UNCLOS. Sustainable development provides important guidance and also allows for flexibility since, despite the unity, each particular system calls for a custom-tailored approach that accounts for the differences.

14 UNCLOS, Preamble.

15 Jan van Ettinger, Alexander King and Peter B Payoyo, ‘Ocean governance and the global picture’ in Peter B. Payoyo (ed), *Ocean governance: sustainable development of the Seas* (United Nations University Press 1994).

16 On the importance of systemic integration and sustainable development see, eg, ILA Report, ‘International Law on Sustainable Development’ (2006).

17 On a holistic nature of sustainable development see, eg, Michael Decleris, *The law of sustainable development: General principles, A Report produced for the European Commission* (European Communities 2000) 55ff: He finds the schools of development and ecology as extreme because they are one-sided hence suffering from deficient logical method. The first, which is purely analytical, isolates man from his environment and examines his economic action in its own right and over a relatively short timescale (4 to 30 years). The second, although holistic, is pseudo-systemic because while it focuses on ecosystems, it ignores the unique qualities which distinguish mankind from all other living systems. It does indeed have a long-term perspective, but does not correctly grasp the dynamics of ecosystems since it rejects the coexistence of natural and cultural development.

18 In first place, systemic integrity of international law is guaranteed by Article 31(3)(c) of the Vienna Convention on the Law of Treaties [Vienna Convention on the Law of Treaties (adopted 23 May 1969, entered into force 27 January 1980) 1155 UNTS 331 (Vienna Convention)].

19 For the elements of sustainable development, see section 3.2 below.



2.1 How are the natural systems of seas and outer space connected?

Outer space and the seas constitute a unity when viewed from the aforementioned systemic perspective. But they also differ in many ways, one of which is that the oceans directly support life on earth and the survival of humanity depends on them. The environment of outer space, on the other hand, seems to be hostile for humans; hence, the protection of the space environment *per se* does not have much support in legal doctrine. What is widely supported by the international community, however, is the sustainability of use of outer space.²⁰ This is because the use of space is *indirectly* vital for human survival. The missing link is technology. Technology has made the use of space possible for the benefit of humanity. The importance of space science and space applications for education, health, environmental monitoring, management of natural resources, disaster management, meteorological forecasting and climate modelling, navigation and communications was formally noted and translated into a broader international context for the first time by the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), held in Vienna in July 1999. The resulting resolution ‘The Space Millennium: Vienna Declaration on Space and Human Development’²¹ provides a strategy to address global challenges through the use of space science and technology and their applications in addressing the challenges of sustainable development.

Outer space is an integral aspect of management of the seas, and its use strongly contributes to the sustainability and security of the maritime sector. Within Earth observation programs, via remote sensing satellites, a considerable amount of information is gathered about the Earth’s physical, chemical and biological conditions. The data includes, *inter alia*, radar images of sea-ice conditions, data on wind, waves, currents, the Earth’s gravity, sea, ice and land surface topography, temperature, ocean and land surface radiance/reflectance, measurements of the state of the oceans’ ecosystems, water quality, pollution monitoring, salinity and much more. The high-accuracy, near real-time data is then used in applications enhancing marine safety (e.g. marine operations, oil spill containment, ship routing, search and rescue applications), marine resource management (e.g. fish stock management), climate and seasonal forecasting (e.g. climate change monitoring, ice sea seasonal forecasting), and monitoring marine and coastal environments (e.g. ice sheet surveys, water quality, coastal

20 The issue of sustainability of outer space has been analysed within the scope of the UNCOPUOS since 2008, when the informal preparatory group was formed. The topic was formally brought to the agenda of the UNCOPUOS in 2010, which resulted in the creation of the UNCOPUOS Working Group on Long-Term Sustainability of Space Activities. The first meeting of the new Working Group took place same year in conjunction with the 53rd session of the UNCOPUOS. The Terms of Reference of the Working Group were approved in 2011 [Terms of reference and methods of work of the Working Group on Long-Term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee, UN COPUOS Report, Annex II, A/66/20].

21 ‘Space Millennium: Vienna Declaration on Space and Human Development’ in *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space*, UN Doc A/CONF.184/6 (18 October 1999) 6; see also United Nations Office for Outer Space Affairs (UNOOSA), *Solutions for the World’s Problems* (UNOOSA 2006).



activities, pollution control, coastal erosion).²²

Apart from remote sensing satellites, there are also navigation satellites. The positioning services provided by them result in improved ship navigation, traffic management, seaport operations, off-shore exploration and fish finding.²³

Telecommunication satellites enable communication between various subjects, which translates, for example, into improved safety of seafaring ships, search and rescue services, monitoring of vessels in sensitive areas (like international waters), and fleet management services for commercial users. The maritime sector also benefits from general communication-enabling broadband internet and satellite-based communication.²⁴

From a broader perspective, satellite data, services and technology are all part of our daily lives. They help to advance human economic, social and environmental well-being. They enable development of the cross-cutting policy tools that rely on scientific data and information, which should be a critical factor in strategic decision-making and law-making, particularly in the domain of sustainable maritime development.²⁵ The sustainability of this interrelation is therefore vital for sustainable development on earth. To this end, the sustainability-oriented development of a legal framework for outer space is very important.

22 One of the boldest Earth observation programmes is European 'Copernicus' developed by the European Commission in cooperation with the European Space Agency (ESA) [Copernicus Regulation: COM(2013) 312 final/2]. For the mission details see: ESA Copernicus: <www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/Marine_services> accessed 21 May 2015. For other ESA maritime relevant missions see: Gravity Field and Steady-State Ocean Circulation Explorer <www.esa.int/Our_Activities/Observing_the_Earth/The_Living_Planet_Programme/Earth_Explorers/GOCE/Objectives>, Soil Moisture and Ocean Salinity <www.esa.int/Our_Activities/Observing_the_Earth/The_Living_Planet_Programme/Earth_Explorers/SMOS/Objectives> accessed 21 May 2015, Cryosat <www.esa.int/Our_Activities/Observing_the_Earth/CryoSat> accessed 21 May 2015.

23 See, eg, Galileo Mission (agreed upon officially on 26 May 2003 by the EU and the ESA <www.esa.int> accessed 25 July 2015), Galileo fact sheet <http://download.esa.int/docs/Galileo_IOV_Launch/Galileo_factsheet_2012.pdf> accessed 14 April 2015.

24 Telecommunication satellites also play an important role in maritime security. An example is ESA's SAT-AIS initiative (Satellite Automatic Identification System): the ESA ATRES Programme: From Satcom products to services, 2 <<http://esamultimedia.esa.int/multimedia/publications/BR-305/>> <<http://telecom.esa.int/telecom/www/object/index.cfm?fobjectid=30922>> accessed 21 May 2015.

25 Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An Integrated Maritime Policy for the European Union, COM (2007) 574 final, Point 3.2.3. Further down the Communication says that 'the Commission will take steps towards a European Marine Observation and Data Network, building *inter alia* on the GMES initiative'.



3. The concept of sustainable development

3.1 Is there an international obligation to carry out activities in space in a sustainable way?

In 1992, the international community adopted the Rio Declaration on Environment and Development (Rio Declaration).²⁶ Principle 27 of the Rio Declaration conveys the necessity for further development of international law in the field of sustainable development; however, it does not mention outer space. While the seas have benefited from the adoption of the concept of sustainable development, the outer space regime strays from the general developments in international law in this respect. In June 2011, the Committee on the Peaceful Uses of Outer Space (COPUOS) adopted the ‘Terms of reference and methods of work of the Working Group on Long-term Sustainability of Outer Space Activities’,²⁷ in which it suggested the extension of the concept of sustainable development to the domain of outer space as a topic for examination.²⁸ In later communication, sustainable development was replaced with the ‘sustainability’ of outer space, which can convey different values and can be shaped separately from the difficult topics linked to sustainable development, such as intragenerational equity that inevitably involves a debate over the global distribution of wealth.

It has been stated, and rightly so, that the development of concepts in international law reflects the spirit of the particular historical period.²⁹ Sustainable development emerged as a concept in international law and politics in order to reconcile the economic, social and environmental needs of the world.³⁰ The environmental degradation of interdependent large-scale ecosystems, transboundary in their nature, prompted the industrialised world to seek a new partnership with the developing and least-developed countries.³¹ What they met on the other side was poverty that impeded any debate on environmental protection. Out of this ‘encounter’ came the realisation that any economic activity should integrate environmental and social needs – and so sustainable development was born.

The legal status of sustainable development has been heavily debated since its emergence.³² Different approaches and different legal methodologies usually lead to different conclusions, ranging from the deprivation of sustainable development of any legal content, through finding its normative

26 UNGA, The Rio Declaration on Environment and Development, UN Doc A/CONF.151/26 (vol. I) (Rio de Janeiro, 14 June 1992) (The Rio Declaration).

27 Terms of Reference (n 20).

28 *ibid* 53.

29 Rüdiger Wolfrum, ‘The principle of the common heritage of mankind’ (1983) 43 *Houston Journal of International Law* 312, 312 [cited in Helmut Tuerk, ‘The idea of the common heritage of mankind’ in Norman A Matrinez Gutierrez (ed), *Serving the Rule of International Maritime Law* (Routledge 2010) 156].

30 See, eg, Marie-Claire Cordonier Segger and Ashfaq Khalfan, *Sustainable Development Law: Principles, Practices and Prospects* (Oxford University Press 2004) 103.

31 See Peter Bautista Payoyo, *Cries of the Sea: World Inequality, Sustainable Development and the Common Heritage of Humanity* (Martinus Nijhoff Publishers 1997) 117.

32 Cordonier Segger and Khalfan (n 30) 2.



strength in the hands of judges, to attributing to it the status of a customary rule or that of a general principle of law.³³ One can notice, however, that passing time has strengthened the concept, which may suggest its evolution towards a binding norm of international law as a customary rule or rather a general principle.³⁴ This article postulates that, based on legal testing, sustainable development can be accepted as a binding principle of international law and is therefore applicable to outer space law. However, the lack of a clear confirmation of its status by jurists leaves it prone to different interpretations. This factor, coupled with the lack of a formal acceptance of sustainable development by the space law regime, leaves space law cut off from the modern legal developments taking place in international law.

3.2 The notion of sustainable development

The mostly cited and widely accepted definition of sustainable development can be found in the Report of the World Commission on Environment and Development (UNWCED), also known as the Brundtland Report. Sustainable development is a development 'that meets the needs of the present without compromising the ability of future generations to meet their own needs.'³⁵

The definition points to two core components of sustainable development: first, the equitable meeting of present needs (the intragenerational equity), and second, a focus on not hindering future generations from meeting their needs (intergenerational equity).³⁶ Since then, from the extensive discussion and use of the concept, a general recognition of three aspects of sustainable development

33 See section 3.3 below.

34 Eg, Brownlie in the 5th edition of his monograph *Principles of Public International Law* stated that sustainable development remains 'problematic and nebulous', while acknowledging its changing nature [Ian Brownlie, *Principles of Public International Law* (5th edn, Oxford University Press 1998) 287]. In the 6th edition, the words 'problematic and nebulous' were removed and specific elements of SD were identified [Ian Brownlie, *Principles of Public International Law* (6th edn, Oxford University Press 2003) 276-77]. Moreover, he analyses sustainable development in the section on emergent principles. See also Christina Voigt, *Sustainable Development as a Principle of International Law: Resolving Conflicts between Climate Measures and WTO Law* (Martinus Nijhoff Publishers 2009).

35 UN World Commission on Environment and Development, *Report of the World Commission on Environment and Development: Our Common Future* (1987) para 27 <www.un-documents.net/our-common-future.pdf> accessed 23 July 2015. A more recent and more expansive definition can be found in the preamble to the ILA New Delhi Declaration: 'the objective of sustainable development involves a comprehensive and integrated approach to economic, social and political processes, which aims at the sustainable use of natural resources of the Earth and the protection of the environment on which nature and human life as well as social and economic development depend and which seeks to realize the right of all human beings to an adequate living standard on the basis of their active, free and meaningful participation in development and in the fair distribution of benefits resulting therefrom, with due regard to the needs and interests of future generations' [ILA, 'New Delhi Declaration of Principles of International Law Relating to Sustainable Development' (The 70th Conference of the International Law Association, New Delhi, April 2002) <<http://cisdl.org/tribunals/pdf/NewDelhiDeclaration.pdf>> accessed 25 July 2015 (New Delhi Declaration)]

36 See, eg, Alan Boyle and David Freestone (eds), *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford University Press 2001) 12-15.



has emerged.³⁷ First, the economic aspect, that an economically sustainable system must be able to produce goods and services on a continuing basis; second, the environmental aspect, that an environmentally sustainable system must maintain a stable resource base that requires maintenance of biodiversity, atmospheric stability, and other ecosystem functions; third, the social aspect, that a socially sustainable system must achieve distributional equity, adequate provision of social services and political accountability and participation.³⁸ Overall sustainability is therefore to be achieved through integration of economic, environmental and social values. The principle of integration is key to achieving sustainable development; and integration can be ensured by the specific tools and procedures that are an integral part of sustainable development.³⁹

The goals of sustainable development are multidimensional and complex, just like the path leading to them. From the systemic point of view, this is what constitutes a 'good' concept. On the one hand, it is easy to grasp, but on the other, its complexity allows for better reflection on the intricate nature of reality. It obviously raises questions on how to balance objectives, how to judge success or failure, or which value should be given precedence.⁴⁰ To this end, sustainable development provides for flexibility, which allows for the adoption of a set of tools custom-tailored for a particular domain. As is often highlighted, the three principles outlined above resonate at a common-sense level. Because of its 'inescapable logic',⁴¹ sustainable development satisfies the criterion for wide applicability that accounts for differences among various legal regimes.

3.2.1 Conceptualisation of the legal content

The UN Conference on the Human Environment, held in Stockholm in 1972, created considerable momentum for conceptualisation of the theoretical framework of sustainable development. The concept of sustainable development was then set out in more detail in the 1992 Rio Declaration. While the Stockholm Conference and the UNWCED were politically important to the conceptualisation of sustainable development, it was the Rio Conference that consolidated its meaning and provided the impetus for developments in the scope of international law.⁴² Although the Rio Declaration does not

37 See, eg, Nico Schrijver, *The Evolution of Sustainable Development in International Law: Inception, Meaning and Status* (Martinus Nijhoff Publishers 2008); Nico Schrijver and Friedl Weiss (eds), *International Law and Sustainable Development: Principles and Practice* (Brill Academic Publishers 2004); Cordonier Segger and Khalfan (n 30); Boyle and Freestone (n 36).

38 Jonathan M Harris, 'Basic Principles of Sustainable Development' (2000) 5-6 <http://notendur.hi.is/~bdavids/UUA101/Readings/Harris_2000_Sustainable_development.pdf> accessed 10 May 2015.

39 See Centre for International Sustainable Development Law (CISIL) <<http://cisil.org/tribunals/overview.html>> accessed 25 June 2015.

40 Norgaard points out that we can 'maximize' only one objective at a time. Norgaard concludes that 'it is impossible to define sustainable development in an operational manner in the detail and with the level of control presumed in the logic of modernity.' [Cited in Harris (n 38) 6].

41 *Case Concerning the Gabčíkovo-Nagymaros Project Case (Hungary v Slovakia)* (Separate Opinion of Judge Christopher Weeramantry) [1997] ICJ Rep paras 88, 95.

42 Dire Tladi, *Sustainable Development in International Law: An Analysis of Key Enviro-Economic Instruments* (Pretoria University Law Press 2007) 11-37.



offer a definition of sustainable development, it does consolidate the meaning of sustainable development through the 27 principles that represent the formative elements of sustainable development, both substantive and procedural. With the Rio Declaration, a system of values and tools emerged, which enabled integration of the economic, environmental and social aspects of human development.⁴³

First of all, Principle 1 of the Rio Declaration seals the anthropocentric character of the concept of sustainable development through the open statement that ‘human beings are at the centre of concerns for sustainable development’.⁴⁴ It is widely seen as a departure from the environmentally oriented Brundtland Report. The ‘three pillar’ approach that builds on integration of the equally important environmental, economic and social issues was reaffirmed by subsequent conferences on sustainable development that took place in Johannesburg in 2002⁴⁵ and Rio de Janeiro in 2012⁴⁶ and is widely reflected in international law.

The substantive elements of sustainable development are mainly set out in Principles 3-8 of the Rio Declaration. They encompass the sustainable utilisation of natural resources, the integration of environmental protection and economic development, the right to development and the principle of equity in the allocation of resources for both present and future generations (intra- and inter-generational equity).⁴⁷ The procedural elements are found in Principles 10 and 17, which deal with public participation in decision-making processes and environmental impact assessments.⁴⁸ The Delhi Declaration of the International Law Association (ILA) also provides for a list of substantive and procedural elements of sustainable development.⁴⁹ These elements represent goals and means to achieve them. While intra- and inter-generational equity represent an ideal or a goal that states should strive for, the essence of sustainable development lies in the employed means, most notably in the integration of environmental, economic and social values, which, in turn, can be implemented through various procedural elements of sustainable development provided for in the Rio Declaration. For this reason, sustainable development is also perceived as a concept of means.⁵⁰

43 The UNGA referred to the Rio Declaration as ‘containing fundamental principles for the achievement of sustainable development, based on a new and equitable global partnership’ [A/RES/48/190].

44 In contrast to the Stockholm Declaration, which inclined towards environmental concerns.

45 See UNGA, Johannesburg Declaration on Sustainable Development (in Report of the World Summit on Sustainable Development, Annex I, A/CONF.199/20, Johannesburg, 4 September 2002) (The Johannesburg Declaration).

46 See UNGA, Rio+20 Declaration ‘The Future We Want’ (in Report of the UN Conference on Sustainable Development, Chapter I - Annex, A/CONF.216/16 Rio de Janeiro, 22 June 2012) (The Rio+20 Declaration).

47 Boyle and Freestone (n 36) 9.

48 *ibid.*

49 New Delhi Declaration (n 35).

50 See Virginie Barral, ‘Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm’ (2012) 23 *The European Journal of International Law* 377.



3.3 Grasping the legal nature of sustainable development

Indeed, for many scholars the answer to the question of the legal status of sustainable development is quite straightforward: sustainable development is an important philosophical or political objective, but it is not a legal one. Although a lot of room is usually left for other interpretations, many highlight that the connection of sustainable development with law is restricted to the fact that, as a political objective, it impacts international negotiations; hence, it contributes to law formation while remaining separate from it.⁵¹

Nevertheless, there is an increasing number of voices that perceive it as a norm with normative value.⁵² First, the concept was introduced as a legal proposition in the Rio Declaration. The Rio Declaration, apart from enjoying worldwide acceptance, is formulated in terms of rights and obligations and uses prescriptive language in order to modify the conduct of various subjects. Its legal scope was further reflected in a large number of other binding and non-binding legal documents.

Nevertheless, in order to be recognised as a positive norm of international law, the rule must emanate from one of the sources of international law: conventions, custom or general principles of law.⁵³

Sustainable development is ubiquitous in international law. In international treaty law, it is an agreed upon objective of many international treaties, at both the global and regional levels.⁵⁴ As such, sustainable development can therefore be considered as part of the treaty's 'object and purpose', as defined by the Vienna Convention on the Law of Treaties (Vienna Convention),⁵⁵ and therefore directly relevant in the interpretation of provisions of the treaties⁵⁶ and binding on State Parties.

The concept often appears as an objective, or a reference in a preamble, in most international statements and declarations related to environmental, social and economic issues since the 1992 Rio de

51 *ibid* 378.

52 According to Virally, a proposition will have legal scope when it is formulated 'with the intention to modify . . . elements of the existing legal order, or . . . that its implementation effectively achieves this result' [M Virally, 'Le rôle des "principes" dans le développement du droit international' in Faculté de droit de l'Université de Genève, Institut universitaire des hautes études internationales, *Recueil d'études de droit international en hommage à Paul Guggenheim* (1968) (cited in Barral (n 50) 383)].

53 Statute of the International Court of Justice (San Francisco, 24 October 1945, in force 26 June 1945) art 38.

54 See Cordonier Segger and Khalfan (n 30) 281-94.

55 Vienna Convention, arts 31 and 33.

56 The concept of sustainable development can be considered part of the object and purpose of the following international treaties (examples): the 1992 *UN Convention on Biological Diversity* and its 2000 *Cartagena Protocol*, the 1992 *UN Framework Convention on Climate Change* and its 1997 *Kyoto Protocol*, the 1994 *UN Convention to Combat Desertification and Drought*, the 1994 *North American Free Trade Agreement*, the 1995 *Straddling Fish Stocks Agreement* of the 1982 *UN Convention on the Law of the Sea*, the 2000 *Cotonou Partnership Agreement* between the European Union and the African Caribbean and Pacific countries, the 2001 *International Treaty on Plant Genetic Resources for Food and Agriculture*, and many others.



Janeiro Earth Summit.⁵⁷

The UNCLOS itself is a great example of incorporating sustainable development into the legal regime governing the seas. Although it does not use the actual phrase 'sustainable development', it incorporates all the elements of sustainable development.⁵⁸

In this pantheon of instruments, the Treaty on the Functioning of the European Union (TFEU) constitutes a noble example.⁵⁹ It is a high-ranking international treaty and specifically imposes an obligation on European countries to 'work for the sustainable development of Europe'.⁶⁰ The treaty also included outer space in the common competences,⁶¹ therefore, through this treaty obligation, European countries are obliged to work towards the sustainable development of Europe, including outer space.

Although the concept of sustainable development is widely accepted by various international treaties, it was never accepted as a part of the space law regime. Consequently, there is no treaty obligation to develop sustainably in outer space.⁶²

The concept of sustainable development could be directly applied to space activities if it enjoyed the status of a customary rule or a general principle of law. However, determining whether a norm has achieved the status of a recognised source of international law is no easy feat. In the case of sustainable development, the doctrine is divided. Some argue that the concept is intrinsically incapable of achieving such a status.⁶³ According to Lowe, sustainable development lacks norm-creating character, which rules out its possible status as a customary rule or general principle of law.⁶⁴ Its normativity cannot be assessed according to classic proof of *opinio iuris* or generality of state practice because it is a changing concept with content prone to different interpretations, and is therefore unable to result in uniform, widespread and continuous state practice. For proponents of a systemic approach, sustainable development is an obligation that simply might not fit within positivist reductionist thinking⁶⁵ because it belongs to the realm of a modern legal regime that actually accounts for the challenges of today.

57 The World Trade Organisation (WTO) recognises sustainable development among its objectives, what was later confirmed in the 2001 Doha Declaration: 'We strongly reaffirm our commitment to the objective of sustainable development, as stated in the Preamble to the Marrakesh Agreement.' The WTO Appellate Body found in the *US – Shrimp Case*, that '[t]his concept has been generally accepted as integrating economic and social development and environmental protection.'

58 Ebbesson and others (n 10) 196.

59 Consolidated Version of the Treaty on the Functioning of the European Union [2008] OJ C115/49 (TFEU).

60 TFEU, art 3(3).

61 TFEU, arts 4(3) and 189.

62 The concept of sustainable development was developed much later.

63 Vaughan Lowe, 'Sustainable Development and Unsustainable Arguments' in Alan Boyle and David Freestone (eds), *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford University Press 2001) 23.

64 *ibid* 23-25.

65 See Decleris (n 17).



Turning to the courts' decisions in order to find an answer, two cases need to be considered. The International Court of Justice (ICJ) approached the issue of defining the legal status of sustainable development in the *Gabčíkovo-Nagymaros Project* case. In the judgement, the ICJ invoked 'the concept of sustainable development' stating that it reconciles economic development with protection of the environment.⁶⁶ The reliance of the Court on the concept of sustainable development has attributed sustainable development with a legal function. Notwithstanding the judgement, the separate opinion of the Vice-President of the Court, Judge Weeramantry, describes sustainable development as 'more than just a concept' and as 'a principle with normative value'.⁶⁷ In the *Pulp Mills* case, the ICJ further contributed to the legal evolution of the concept of sustainable development. However, like in the *Gabčíkovo-Nagymaros* case, the Court was unwilling to affirm sustainable development as a binding norm of international law. It refers to sustainable development as an 'objective'.⁶⁸ The separate opinion of Judge Trindade, however, describes sustainable development as one of the principles of international environmental law.⁶⁹ The court avoided classifying it as a classical source of international law, yet its classification as a concept or objective gives sustainable development a normative status at least as an element of the process of judicial reasoning.

To that end, Lowe argues that as 'sustainable development is a meta-principle, acting upon other legal rules and principles – a legal concept exercising normativity, pushing and pulling the boundaries of true primary norms when they threaten to overlap or conflict with each other'.⁷⁰ But he sees such normative status of sustainable development as a component of judicial reasoning that acquires a normative value through decisions of the courts, not as a primary rule of the conduct of states.⁷¹

Without a firmly established status as a customary rule or a general principle, there are warranted doubts that there is a general obligation placed on states to develop sustainably. Nonetheless, recently, more scholars are insisting that its presence in international treaties and in a countless number of other international documents is a great token of *opinio iuris* and probably determinant of state practice.⁷² But determining uniform state practice on the implementation level is difficult, if not impossible, due to the evolutive and complex nature of sustainable development.

66 *Case Concerning the Gabčíkovo-Nagymaros Project* (n 41) 7.

67 Separate opinion of Judge Christopher Weeramantry (*Case concerning the Gabčíkovo-Nagymaros Project*) [ibid, paras 88, 95].

68 *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)* [2010] ICJ Rep 14, para 177.

69 *Case Concerning Pulp Mills on the River Uruguay (Argentina v Uruguay)* (Separate opinion of Judge Cañado Trindade) [2010] ICJ Rep 14, para 6, See also para 132ff.

70 Lowe (n 63) 31.

71 *ibid.*

72 See Barral (n 50).



3.4 Evolutive nature of sustainable development

Sustainable development is an evolutive concept, which means that its substance varies *ratione temporis, personae, materiae and loci*,⁷³ as was highlighted by the Brundtland Report: ‘sustainable development is not a fixed state of harmony, but rather a process of change’.⁷⁴

According to Barral, because sustainable development is intrinsically evolutive, its content is difficult to identify and probably immune to clear legal definition. She observes that the efforts to define it clearly led some to conclude that it is empty of substance or incapable of legal classification.⁷⁵

The indeterminacy argument regarding sustainable development is not a new one.⁷⁶ It was also invoked regarding established principles. The realists introduced the indeterminacy argument to demonstrate that the application of the principles of deductive reasoning to the set of legal materials did not and could not uniquely determine the outcome of particular cases. This is also the case for sustainable development. To some extent, flexibility is a main strength and drawback of the principles in general. Yet, as mentioned before, sustainable development challenges legal researchers in one more way. It is an evolutive concept. Change is its nature. Its substantive and procedural elements have to change in order to be sustainable. Therefore, the concept’s substance inherently varies *ratione temporis, personae, materiae and loci*.

The overarching coherence, however, can be found in the fact that sustainable development is always accepted as an objective to aspire to.⁷⁷ Many legal instruments talk about the promotion of sustainable development or about striving to achieve it. They therefore point to sustainable development as a norm guiding the conduct of states – but as a norm of means, not a norm of results.⁷⁸ Although a state might not be developing in a sustainable way, it is obliged to *strive* to develop in a sustainable way. This can be read as an obligation to employ specific instruments to achieve it. The Rio Declaration provides for a range of instruments that constitute substantive and procedural elements of sustainable development. These means, however, would have to vary so as to be sustainable in a given (changing) reality. The complex nature of sustainable development does not allow for a strictly positivist assessment of its normative scope, unless two assumptions are put in place: first, that sustainable development is an evolutive concept; second, that it is a norm of means, not results.

There is one last view that sustainable development enjoys: it is also perceived as an ‘emerging area of law’ at the intersection of environmental and developmental laws.⁷⁹ This seems to be in line with

73 *ibid* 392.

74 The Brundtland Report (n 35) 17.

75 Barral (n 50) 382ff.

76 See John Hasnas, ‘Back to the Future: From Critical Legal Studies Forward to Legal Realism, Or How Not to Miss the Point of the Indeterminacy Argument’ (1995) 45 *Duke Law Journal* 84.

77 Barral (n 50) 388.

78 *ibid* 390ff.

79 See Cordonier Segger and Khalfan (n 30).



Principle 27 of the Rio Declaration, which calls for ‘further development of international law in the field of sustainable development.’ In this case, applicability of the objective of sustainable development could be secured by Article III of the Outer Space Treaty (OST), which makes general international law applicable to space law.

Is sustainable development a part of international law? The answer is yes. At least as an objective with normative status determining state conduct, not only judicial reasoning, as an accepted principle of environmental law,⁸⁰ or arguably as a customary rule or a general principle of law, and possibly as an ‘emerging area of law’ in its own right.⁸¹ Despite the disagreement on its legal status, sustainable development has been given great recognition in international law and furnished with the capacity to impact law-making processes. As Schrijver and Weiss point, sustainable development is not going to disappear from sight because it has already established its credentials in the legal realm.⁸²

4. Rationale behind applying the concept of sustainable development to outer space law

Space law is particulate law,⁸³ a self-contained system of rules that is governed by a set of specific principles⁸⁴ developed to deal with the practical problems of use and exploration of outer space.⁸⁵ It consists of an international binding treaty regime, declarations and guidelines, industry guidelines, regional and national laws and arrangements. The core of the system constitutes legal instruments created by the UNCOPUOS⁸⁶ during the ‘golden age’ of space law-making.⁸⁷ The OST⁸⁸ is regarded as the *Magna Carta* of outer space that enshrines fundamental principles relating to the use and exploration of outer space. Moreover, it serves as the foundation for the other four major international

80 In the *Iron Rhine* case the tribunal was of the view that international law today ‘require[s] the integration of appropriate environmental measures in the design and implementation of economic development activities’, and that this integration requirement means that ‘where development may cause significant harm to the environment there is a duty to prevent, or at least mitigate, such harm’, which ‘has now become a principle of general international law’ [PCA, *Iron Rhine case (Belgium v Netherlands)*, Award of the Arbitral Tribunal of 24 May 2005, 29 <www.pca-cpa.org/showpage.asp?pag_id=1155> accessed 25 July 2015]. The European Union has accepted a sustainable development as a principle of environmental law [TFEU, art 37].

81 Sustainable development law is found at the intersection of three principal fields of international law: international economic law, international environmental law and international social law. Sustainable development law refers to emerging substantive body of legal instruments, norms and treaties, supported by distinctive procedural elements, (CSIL) <www.Csil.org> accessed 25 July 2015.

82 Schrijver and Weiss (n 37).

83 Francis Lyall and Paul B Larsen, *Space Law: A Treatise* (Ashgate 2009) 2.

84 Koskenniemi (2006) (n 3) 65ff.

85 Lyall and Larsen (n 83) 2.

86 For the accomplishments and history of the UNCOPUOS see, eg, S Neil Hosenball, ‘The United Nations Committee on the Peaceful Uses of Outer Space: Past Accomplishments and Future Challenges’ (1979) 7(2) *Journal of Space Law* 95-114.

87 Gennady M Danilenko, ‘Outer Space and the Multilateral Treaty-Making Process’ (1986) 4 *High Technology Law Journal* 218.

88 See OST (n 2).



conventions, i.e. the Rescue Agreement,⁸⁹ the Liability Convention,⁹⁰ the Registration Convention⁹¹ and the Moon Agreement.⁹² These five treaties are regarded by most as the controlling authority for human activities in outer space.

Space law in its current shape cannot be regarded as an operative regime for future activities in space, particularly resource mining. First, it is too general, and second, it permits a reductionist interpretation of its rules that ignores current developments.

The application of the concept of sustainable development to space law could contribute to its revitalisation. The accepted legal passage for this process can be found in Article III of the OST, which makes general international law applicable to space law.⁹³ Moreover, Article 31(3)(c) of the Vienna Convention⁹⁴ requires that a treaty be interpreted in light of the rules of international law. This rule should not be limited by the principle of contemporaneity⁹⁵ since the intentions of the negotiating parties during the space law-making process were to use general, framing provisions capable of encompassing future developments.⁹⁶ Interpretation of the treaty should therefore account for the temporary developments in international law, such as sustainable development. It would be damaging to the space law regime to freeze it in the reality of the 1960s as activities in outer space are pinned to the fast-changing technological developments. 'International law is a truly living law which can shift in content from day to day in order to meet ... the challenge arising from man's venture into new frontiers.'⁹⁷ Sustainable development could help to revitalise space law by setting up both existing and future rules in light of modern developments that take place in international law, especially on the eve of industrial changes relating to the excavation of resources of celestial bodies that must entail drawing up new rules.

It also looks like sustainable development is slowly paving its way to outer space law. Most of all, it is not extrinsic to space law. From the contemporary perspective many provisions of the OST can

89 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (adopted 22 April 1968, entered into force 3 December 1968) 672 UNTS 119.

90 Liability Convention (n 2).

91 Convention on Registration of Objects Launched into Outer Space (adopted 14 January 1975, entered into force 15 September 1976) 1023 UNTS 15.

92 Moon Agreement (n 7).

93 It states that States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with international law [OST (n 2)].

94 Vienna Convention (n 18).

95 According to which a treaty must be interpreted in the context of the law applicable at the time of its conclusion [See *Island of Palmas Case (Netherlands, USA)* II RIAA (1928) 829, 845 and 839] unless Parties agreed otherwise and decide to allow the interpretation of the treaty to follow modern legal developments [See ILC Commentaries to the Draft Articles on the Law of Treaties [1966] ILC Yrbk 187, paras 16, 242].

96 Nandasiri Jasentuliyana, 'Space Debris and International Law' (1998) 26(2) *Journal of Space Law* 139, 141.

97 Bin Cheng, *Studies in International Space Law* (Clarendon Press 1997) 680.



be seen as a passage of sustainable development to the domain of outer space.⁹⁸ There are also many multilateral regulatory initiatives advancing the issue of sustainability of outer space.⁹⁹

5. Learning from the law of the sea: the relevance of a legal regime governing the deep seabed for the development of outer space law

The process of applicability of sustainable development to outer space can be better understood and conducted if the experiences and developments in other branches of international law, particularly the law of the sea, are taken into account. The legal regimes of the seas and outer space are often subject to a comparative analysis because the domains they regulate are alike in many ways. The seas and outer space have stimulated the human imagination for centuries. They have both been areas of progressive conquest directly dependent on technological developments. Their legal statutes have been going through similar changes, with the law of the sea being a step ahead of space law.

Nevertheless, unlike the relatively recent space law, the general law of the sea has matured in a slow process that is as old as sailing itself.¹⁰⁰ Even the changes introduced by the UNCLOS, although revolutionary in many ways, were accompanied by heavy debate and tested by passing time. The current regime governing the seas represents a truly international consensus on the new type of philosophy and approach to the issues relating to the management of resources, including global commons. This is where the strength and legitimacy of the law of the sea lies, as a model legal instrument for governing areas beyond national jurisdiction. Albeit not perfect, it provides for normative solutions that serve as a good model of reference while developing the more feasible space law under the umbrella of sustainable development.

The UNCLOS is a comprehensive legal instrument focused on the sustainable use and management of the seas. The conclusion of the UNCLOS was in response to the pressing problem of environmental degradation of natural resources of the seas. Before the UNCLOS, the use of the seas was settled in the Westphalian reality based on the sovereignty of states and the theory of a big sea. The growing population, unsustainable fisheries and the belief that oceans are capable of absorbing all the waste that is the result of human economic activity ended with the degradation of both marine resources and the marine environment (as predicted by Hardin's theory drawing on the tragedy of the com-

98 Eg, Article I of the OST provides that outer space shall be free for exploration by all States on a basis of equality without discrimination of any kind. This Article can be seen as a passage for the concepts of inter- and intra-generational equity in space law.

99 The COPUOS Working Group on Long-Term Sustainability of Space Activities The LTSSA (2010), the International Code of Conduct for Outer Space Activities (first version adopted in 2008), the draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (submitted in 2008), the UNGA Group of Governmental Experts on the transparency and confidence building in outer space (2010).

100 The maritime customs began to be accepted throughout the European continent in the middle ages [Malcolm N Shaw, *International Law* (6th edn, Cambridge University Press 2008) 19].



mons).¹⁰¹ The UNCLOS is a great example of incorporating sustainable development into the legal regime in order to tackle the problems of environmental degradation and depletion of resources of global commons. Although it does not use the actual phrase 'sustainable development', it incorporates all the elements of sustainable development.¹⁰² The process of negotiation and acceptance of the UNCLOS, as well as the innovative solutions it introduces, serves as a great model to build upon.

5.1 Global commons and use of resources

The sustainable use of natural resources is probably the most visible substantive element of sustainable development. The use of natural resources has been a constant subject of international competition. The scarcity and finite nature of natural resources raise tensions among states and are often believed to be a primary driving force behind states' conduct on the international arena.

So far, the resources that have been exploited in outer space are Earth orbits, which are mainly used by satellites and are cluttered with space debris. Meanwhile, the seas offer a whole range of resources, including food. The common ground between the seas and outer space with respect to resources is reached when it comes to mineral mining.

The international community has developed a few different types of legal regimes to govern natural resources: (1) within their territorial limits, states exercise sovereign rights over natural resources; (2) in cases of international rivers and migratory species, they share the resources; (3) states also recognise the *res communis* status, which is the area beyond national jurisdiction where, as in the case of the high seas, no user has exclusive rights to resources and no one can exclude others from exploiting them, but capturing resources results in exclusive property rights. Lastly, (4) some parts of *res communis* can have the special status of *res communis omnium* or (arguably) *res communis humanitatis*.¹⁰³ The key concept of this category is 'the common heritage of mankind', but it can also take shape of 'the province of all mankind', as in the case of outer space.

5.2 The common heritage of mankind and the province of mankind

In 1970, the UN General Assembly adopted Resolution 2749 recognising the CHM as the principle governing the exploitation of the international seabed. The concept of the CHM was subsequently adopted by the UNCLOS to govern the 'Area'.¹⁰⁴ Under Article 136 UNCLOS, the 'Area' – which is the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction, and its resources – are the common heritage of mankind.

101 See Garrett Hardin, 'The Tragedy of the Commons' (1968) 162 Science 1243.

102 Ebbesson and others (n 10) 196.

103 For the doctrine proposition on distinction between *res communis omnium* and *res communis humanitatis* see Kemal Baslar, *The Concept of the Common Heritage of Mankind in International Law* (Martinus Nijhoff Publishers 1998) 40-42.

104 UNCLOS (n 9).



The CHM was the main innovating aspect of the UNCLOS with respect to the previous law of the sea regime. While other important innovations, such as the exclusive economic zone, were to some extent an evolutionary development of the system, the introduction of the CHM had a revolutionary character.¹⁰⁵ The CHM was specifically designed to achieve aspects of sustainable development in the scope of common spaces. It presupposes a regime different from both the traditional concepts of sovereignty and freedom. It is also argued that the CHM has introduced a new type of subject to international legal relations: mankind.¹⁰⁶

Borgese points to five principles underpinning the concept of the CHM: (a) the principle of non-appropriation; (b) the principle of shared management; (c) the principle of a 'common benefit for mankind as a whole' implying an equitable distribution of benefits; (d) the principle of use for exclusively peaceful purposes; and (e) the principle of conservation for future generations, which reiterates the principle of sustainable development in the oceans.¹⁰⁷

Although the CHM had been conceived prior to the adoption of the OST in 1967, it was not incorporated into it. The novel notion of the 'the province of all mankind' was used instead, which many scholars consider to be the functional and legal equivalent of the common heritage of mankind. Others argue that the two terms, as applied in two different treaties for different purposes, cannot be used interchangeably. Nevertheless, outer space, along with the seabed, ocean floor and subsoil thereof, are often categorised as the CHM. This approach is reflected in the ILA Delhi Declaration that calls '[t]he resources of outer space and celestial bodies and of the sea-bed, ocean floor and subsoil thereof beyond the limits of national jurisdiction as "the common heritage of humankind"'.¹⁰⁸

However, the *de facto* status and provenance of the 'province' and 'heritage' concepts differ. The term 'province of all mankind' was coined in 1966 by the USSR in the drafting process of the OST

105 Borgese commented: 'The basic principle, the motor force of the "marine revolution", is the concept of the Common Heritage of Mankind. It cannot be stressed enough that the adoption of this principle by the XXV General Assembly as a norm of international law marked the beginning of a revolution in international relations' [cited in Ettinger and Payoyo (n 14) <<http://archive.unu.edu/unupress/unupbooks/uu15oe/uu15oe0p.htm>> accessed 20 May 2015].

106 Some scholars insist on legal personality of mankind. Eg, Cocca suggests that 'the international community has recognized the existence of a new subject of international law, namely mankind itself, and has created *jus commune humanitatis*' [Aldo A Cocca, 'The Common Heritage of Humankind Doctrine and Principles of Space Law – An Overview' [1986] Proceedings of the Colloquium on the Law of Outer Space 150]; Markoff points to the fact that with the CHM, mankind was for the first time recognised as a subject of international order and a premier beneficiary of use and exploration of outer space [M G Markoff, *Traité de droit international public de l'espace* (Fribourg 1973) 272, cited in Fabio Tronchetti, *The Exploitation of Natural Resources of the Moon and Other Celestial Bodies: A Proposal for a Legal Regime* (Martinus Nijhoff Publishers 2009) 126].

107 Elisabeth Mann Borgese, 'The Common Heritage of Mankind: From Non-living to Living Resources and Beyond' (cited in Nisuke Ando and others (eds), *2 Liber Amicorum Judge Shigeru Oda* (2002) 1313).

108 New Delhi Declaration (n 49). During the recent discussions at the UN on a third UNCLOS implementing agreement on conservation and sustainable use of marine biodiversity beyond national jurisdiction the developing countries took the position that the CHM regime should be extended to cover marine genetic resources [The UN Informal Consultative Open-ended Process on Ocean and Law of the Sea (6-10 April 2015) <www.un.org/depts/los/consultative_process/consultative_process.htm> accessed 15 July 2015].



and then it found its way into Article 1 of the OST.¹⁰⁹ The USSR insisted on ‘the province of all mankind’ because it refused to recognise the CHM, mainly for ideological reasons, as being rooted in bourgeois Roman law.¹¹⁰ The less developed countries insisted that ‘the province of all mankind’, like the CHM, means that all nations have vested rights in common resources and these should be shared equitably among them. The US also saw the two concepts as indistinguishable but as an expansion of *res communis* governed by the principle of freedom.¹¹¹ As a result, in the negotiating process of the UNCLOS, the less developed countries led the move away from ‘the province of mankind’ as contained in the OST (in the negotiation of which, they had no real power) and turned to ‘the common heritage of mankind’.¹¹²

Since the very beginning, the CHM was to serve as a novel managing mechanism for the seas beyond national jurisdiction,¹¹³ as an alternative to the freedom of the seas.¹¹⁴ ‘The province of all mankind’, on the other hand, since the very beginning, has functioned as an equivalent of the principle of freedom of the seas. It was underpinned by the theory of a big sky with a laissez-faire approach to activities in outer space. This approach was somehow understood, given that space exploration had just begun. The launch of Sputnik 1, apart from sparking fears of a military space race, awakened a tremendous thirst for space exploration. The set of freedoms provided by the OST was an incentive for the development of the space industry. The content of the five treaties adopted by the UNCOP-UOS are a fair reflection of the hopes and fears of the time.¹¹⁵ Nevertheless, it soon became obvious that, despite the immensity of space, the usable outer space is a ‘congested, contested, and competitive’¹¹⁶ finite resource. Just as in the case of the seas, the need for sustainable management of resources became obvious.

109 ‘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 or scientific development, and shall be the province of all mankind’ [OST, art 1].

110 Dekanzov (1974) (cited in Joanne Irene Gabrynowicz ‘The “province” and “heritage” of mankind reconsidered: a new beginning’ (2nd Conference on Lunar Bases and Space Activities of the 21st Century, Proceedings from a conference held in Houston, TX, April 1988).

111 *ibid.* In practice, this interpretation was guiding the states’ conduct in outer space until the moment when the actions were taken to tackle the problem of space debris.

112 *ibid.*

113 The CHM was originally intended as a concept that would revolutionise the law of the sea by applying to all ocean space and resources. But in 1967, Arvid Pardo suggested applying it to the limited entity of the seabed.

114 Freedom of the high seas, developed by the Dutch jurist Hugo Grotius (1583–1645), creates an open access regime allowing for its laissez-faire use. Presently, however, the concept of freedom of the sea is not absolute and needs to be understood in the context of the present legal regime and in relation to the other potentially conflicting uses and interests.

115 Gabrynowicz (2004) (n 5) 1042.

116 The US National Security Space Strategy (2011) 1 <www.defense.gov/home/features/2011/0111_nsss/docs/NationalSecuritySpaceStrategyUnclassifiedSummary_Jan2011.pdf> accessed 25 July 2015.



5.3 The CHM: the perplexing concept

The CHM eventually made its way into the Moon Agreement. Article 11 calls the resources of the Moon and other celestial bodies a common heritage of mankind.¹¹⁷ As in the case of the seas, the acceptance of the CHM in the context of outer space turned out to be problematic. The fact that the main space-faring states refrained from adopting the Moon Agreement clearly demonstrates the issue.¹¹⁸

On the one hand, many scholars see the continued relevance of the CHM concept in the management of the global commons, but on the other hand, there are significant difficulties surrounding its acceptance by states.¹¹⁹ Despite many legal drawbacks, the true nature of the problem is political and therefore is a subject for a political solution.¹²⁰ The element of common and equitable sharing of benefits associated with the exploitation of resources and governance via a common management regime entails an international discord. The line of division runs between the 'haves' and the 'have-nots'.

The changes to the CHM introduced by the 1994 Implementation Agreement¹²¹ allowed for wide acceptance of the concept.¹²² The introduced changes, in spite of softening the CHM concept, managed to keep its spirit and gained worldwide acceptance.¹²³

The launch of the 1994 Implementation Agreement was possible due to the relaxed position of less developed countries in the face of a diminishing interest in mining the seabed.¹²⁴ The situation relating to outer space is now quite different. There is a great interest in mining minerals with huge investments being made in the development of relevant technology, but the ambiguity and ramifications of the terms have left space law as one of the least stable and least clarified areas of international law,¹²⁵ continuously deterring the progress of resource extraction in outer space.

The concept of sustainable development is characterised by far greater acceptance than the CHM. The lack of political will to accept sustainable development is to a large extent due to the fact that

117 Moon Agreement, art 11.

118 As of 15 January 2015, the agreement enjoys 16 ratification and 4 signatures (n 7).

119 See Tronchetti (n 106).

120 Gabrynowicz (1988) (n 110).

121 The Implementation Agreement (n 13).

122 The main changes introduced by the Implementation Agreement are: introduction of a consensus as a primary voting system; different representation on the Council; a market-oriented approach towards the issue of technology transfer; reduction of the fees; adoption of fifteen-year timetables providing for more economic certainty for investors [John E Noyes, 'The Common Heritage of Mankind: Past, Present, and Future' (2012) 40:1-3 *Denver Journal of International Law and Policy* 447].

123 In practice, no state is actively pursuing any alternative deep seabed mining regime. Activity is taking place only under the UNCLOS Convention/1994 Implementation Agreement regime [ibid 465].

124 Tronchetti (n 106) 83ff.

125 Yun Zhao, 'An International Space Authority: A Governance Model for a Space Commercialization' (2004) 30 *Journal of Space Law* 279.



it is identified with the CHM when it comes to governance of the common spaces. However, the acceptance of sustainable development would not mean automatic acceptance of the CHM in the form proposed by the Moon Treaty because a solution that does not enjoy wide acceptance cannot yield sustainable results. The applicability of sustainable development would require re-examination of the status of outer space with respect to natural resources when the time is ripe. Sustainable development, once applied, would draw a framework of values with the potential to ensure the sustainable use of outer space. Such a framework approach would help prevent the possible development of custom based on the practice of states that currently have the technology necessary to extract resources, leaving the 'have-nots' stranded.¹²⁶

The CHM concept in outer space has great potential to manage the common resources of outer space but it needs to be re-examined, just like in the case of the seabed. One needs to keep in mind that the reluctance to accept the CHM as introduced by the UNCLOS was mainly due to the proposed *lex specialis*, while the aversion to the CHM in outer space is mainly due to the very general wording and lack of clarity. If we are to enter the new era of mining the mineral resources of outer space, the space law regime must develop. The changes introduced by the Implementation Agreement in the law of the sea in that respect can definitely serve as a good example. In the meantime, the application of sustainable development would secure important values while also leaving room for new legal developments.

Nevertheless, the extraction of resources must first be feasible and sustainable economic activity be made possible. Sustainable development recognises the importance of the human-made systems, including the economic system, and as a result, economic issues could be given priority in order for mining to be feasible at all. As the example of the seabed shows, the extended debate over non-existing economic activities may lead to an impasse with respect to the extraction of resources. While the impasse in the excavation of resources from the seabed can be justified by the environmental concerns, the extraction of minerals from celestial bodies, apart from technological issues, primarily poses political and legal problems.

5.4 Delimitation of outer space

There is at least one more way that future developments in outer space can benefit from the law of the sea. There is a trend in outer space law that proposes different legal regimes for outer space depending on where the activity takes place. Currently, outer space holds one legal status that is by no means clear, neither in terms of the nomenclature nor the interpretation.¹²⁷ Furthermore, there is an ongoing debate on the delimitation of outer space from air space. As the two regimes are subordinat-

126 With the unclear legal status in place, various parties, foreseeing potential profit, have started their own projects aiming at space. The United States has also executed a series of bilateral Memoranda of Understanding with Partner States concerning outer space activities. With no clear-cut rules and regimes in place, the activities are carried out subject to Partner States' own interpretations [Noyes (n 122) 465].

127 See Part 5.2 above.



ed to different jurisdiction regimes (*res communis* and sovereignty respectively) a natural question for a lawyer is where does 'space' begin? Space law does not settle the issue, nor does doctrine agree on an answer.¹²⁸ Because of this lack of agreement, the 'working' border has been set up at the altitude of 100 km, known as Kármán Line.¹²⁹

The homogeneous legal status of outer space does not seem likely to endure in the long-term. In the years preceding the finalisation of the OST, the issue of space and celestial bodies was already being discussed.¹³⁰ It was argued that celestial bodies were physically markedly different from their largely void surroundings, such as orbits, and should therefore be subject to a separate legal regime, which was reflected in the wording of the international space treaties. Space law did not approach the issue directly but uses the phrase 'outer space and celestial bodies' when defining the scope of its provisions, which can suggest that there is a possibility of installing two separate legal regimes depending on the physical characteristics of their subject matter. Also, the Moon Agreement postulates a distinct legal status for the Moon, namely the CHM.¹³¹ To this end, the various types of jurisdiction employed by the law of the sea suggest that the introduction of similar changes with respect to outer space could be a viable solution. The status of airspace begs a comparison with territorial waters. The legal status of 'other areas' of outer space would have to be a mix of different determinants mostly dependent on the subject matter (celestial body, orbits, unused space, deep space, etc.) and probably in light of a functional approach.

6. Conclusion

Since a viable system of law presupposes continuous law-making activity,¹³² the development of space law is inevitable. The extension of the concept of sustainable development to the domain of outer space would help keep the system viable, coherent and integrated into general international law. Its adoption would resemble the development of the existing legal system, rather than a radical change.

Just like in the case of the seas, the future governance of mineral resources in space needs to be established. The application of sustainable development to outer space would draw a necessary frame-

128 Not all the researchers supported a delimitation of outer space understood as a permanently marked border between airspace and outer space. A number of them presented so called 'functional approach', and postulated that regulation should depend on the nature of the activity rather than on its location. This division in the debate between proponents of 'spatialism' and 'functionalism' has been ongoing till present days [see, eg, Frans G von der Dunk, 'The Delimitation of Outer Space Revisited: The Role of National Space Laws in the Delimitation Issue' (1998) Paper 51 University of Nebraska, Space and Telecommunications Law Program Faculty Publications].

129 The Fédération Aéronautique Internationale, '100km Altitude Boundary for Astronautics' <www.fai.org/icare-records/100km-altitude-boundary-for-astronautics> accessed 28 July 2015.

130 See the reports of the Working Group III of the International Institute of Space Law (IISL) on the legal status of celestial bodies, published in the 1962-1966 IISL Proceedings of the colloquium on the law of outer space.

131 Moon Agreement, art 11.

132 Danilenko (n 87).



work for this process. The concept of the common heritage of mankind is believed to be at the heart of sustainable development when it comes to the governance of common spaces. Nevertheless, its current form, as put forth by the Moon Treaty, has not been accepted by the main space-faring states. To this end, the experiences learned from drafting Part XI of the UNCLOS and its amendment by the 1994 Agreement can serve as model to follow.

Unlike the UNCLOS, the OST is merely a broad framework, which is waiting to be filled with precise rules. As the debate in the law of the sea shows, the developed and developing countries have all demonstrated that they want their share of space exploration, and generally for the same reasons. This points to the probability that, if properly facilitated within a supportive structure of sustainable development, cooperation and compromise can occur.¹³³

133 Gabrynowicz (1988) (n 110).