

# DRAFT BUILDING BLOCKS FOR THE DEVELOPMENT OF AN INTERNATIONAL FRAMEWORK ON SPACE RESOURCE ACTIVITIES

## Introduction

*The utilization of space resources has great potential for the future of humankind. In order to create an enabling environment for space resource activities, The Hague Space Resources Governance Working Group<sup>1</sup> was created to promote international cooperation and multi-stakeholder dialogue. It has designed the building blocks below to lay the groundwork for international discussions on the potential development of an international framework, without prejudice to its form and structure.*

*Guided by the principle of adaptive governance, the Working Group considered it neither necessary nor feasible to attempt to comprehensively address space resource activities in the building blocks: space resource activities should be incrementally addressed at the appropriate time on the basis of contemporary technology and practices.*

*On 13 September 2017, the Working Group agreed to circulate the building blocks as the preliminary result of its work and to invite comments to inform its further consideration of the building blocks. It will continue to explore the need, and form, of any future mechanism(s) for the governance of space resource activities. The Working Group hopes that its activities will complement efforts at the national, regional and global level.*

## 1. Objective

- 1.1 The international framework should create an enabling environment for space resource activities that takes into account all interests and benefits all countries and humankind.
- 1.2 To achieve this objective, the international framework should:
  - a) Identify and define the relationship of space resource activities with existing international space law, including the provisions of the United Nations treaties on outer space;

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<sup>1</sup> <http://law.leiden.edu/organisation/publiclaw/iasl/working-group/the-hague-space-resources-governance-working-group.html>

- b) Propose recommendations for the consideration of States for the application or development of domestic frameworks;
- c) Propose recommendations for the consideration of intergovernmental organizations for the application or development of internal frameworks;
- d) Promote the identification of best practices by States, intergovernmental organizations and non-governmental entities.

## **2. Definition of key terms**

- 2.1 Space resource: an extractable abiotic resource *in situ* in outer space.<sup>2</sup>
- 2.2 Utilization of space resources: the recovery of space resources and the extraction of raw mineral or volatile materials therefrom.<sup>3</sup>
- 2.3 Space resource activity: an activity conducted in outer space for the purpose of searching for space resources, the recovery of those resources and the extraction of raw mineral or volatile materials therefrom, including the construction and operation of associated extraction, processing and transportation systems.
- 2.4 Space object: object launched into outer space from Earth, including component parts thereof as well as its launch vehicle and parts thereof.<sup>4</sup>
- 2.5 Space product: product made in outer space wholly or partially from space resources.<sup>5</sup>
- 2.6 Operator: a governmental, intergovernmental or non-governmental entity conducting space resource activities.

## **3. Scope**

- 3.1 The international framework should address States and intergovernmental organizations.
- 3.2 The international framework should address space resource activities within the solar system.

## **4. Principles**

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<sup>2</sup> According to the understanding of the Working Group, this includes mineral and volatile materials, including water, but excludes (a) satellite orbits; (b) radio spectrum; and (c) energy from the sun.

<sup>3</sup> According to the understanding of the Working Group, this excludes secondary utilization of space resources, i.e. (a) utilization of raw materials derived from space resources; and (b) marketing and distribution of space resources.

<sup>4</sup> According to the understanding of the Working Group, this includes objects made wholly or partially from space resources).

<sup>5</sup> According to the understanding of the Working Group, this excludes raw mineral and volatile materials, including water, irrespective of form.

- 4.1 The international framework should be consistent with international law.
- 4.2 The international framework should be designed so as to:
- a) Incrementally regulate space resource activities at the appropriate time (principle of adaptive governance);
  - b) Promote consistency and predictability among domestic frameworks of States and internal frameworks of intergovernmental organizations;
  - c) Contribute to sustainable development;
  - d) Prevent disputes arising out of space resource activities;
  - e) Promote and secure the orderly and safe utilization of space resources;
  - f) Promote the rational, efficient and economic use of space resources;
  - g) Promote the use of sustainable technology;
  - h) Provide legal certainty and predictability for operators;
  - i) Take into particular account the needs of developing countries;
  - j) Take into particular account the needs of science;
  - k) Take into particular account the contributions of pioneer operators.
- 4.3 The international framework should provide that:
- a) Space resources shall be used exclusively for peaceful purposes;
  - b) Space resource activities shall be carried out for the benefit and in the interests of all countries and humankind irrespective of their degree of economic and scientific development;
  - c) Space resource activities shall not harmfully interfere with other on-going space activities, including other space resource activities;
  - d) International cooperation in space resource activities shall be conducted in accordance with international law.

## **5. International responsibility for space resource activities and jurisdiction over space products**

- 5.1 The international framework should provide that States and intergovernmental organizations shall be responsible for space resource activities authorized by them in accordance with their international obligations.
- 5.2 The international framework should provide that space resource activities require prior authorization and continuing supervision by the appropriate State or intergovernmental organization.
- 5.3 The international framework should provide that States and intergovernmental organizations shall exercise jurisdiction and control over space products used in space resource activities authorized by them.

## **6. Access to space resources**

- 6.1 The international framework should enable the unrestricted search for space resources.
- 6.2 The international framework should enable the attribution of priority rights to an operator to search and/or recover space resources *in situ* for a maximum period of time and a maximum area upon registration in an international registry, and provide for the international recognition of such priority rights. The attribution, duration and the area of the priority right should be determined on the basis of the specific circumstances of a proposed space resource activity.

## **7. Utilization of space resources**

- 7.1 The international framework should ensure that resource rights over raw mineral and volatile materials extracted from space resources, as well as products derived therefrom, can lawfully be acquired, and provide for the mutual recognition between States of such resource rights.
- 7.2 The international framework should ensure that the utilization of space resources does not contravene the principle of non-appropriation under Article II OST<sup>6</sup>.

## **8. Due regard for interests of all countries and humankind**

The international framework should provide that States and intergovernmental organizations authorizing space resource activities shall give due regard to the interests of all countries and humankind.

## **9. Avoidance of harmful impacts resulting from space resource activities**

Taking into account the current state of technology, the international framework should provide that States and intergovernmental organizations authorizing space resource activities shall adopt a precautionary approach with the aim of avoiding harmful impacts, including:

- a) Risks to the safety of persons, the environment or property;
- b) Damage to persons, the environment or property;
- c) Adverse changes in the environment of the Earth, taking into account internationally agreed planetary protection policies;
- d) Harmful contamination of celestial bodies, taking into account internationally agreed planetary protection policies;

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<sup>6</sup>1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

- e) Harmful contamination of outer space, including the creation of harmful persistent space debris;
- f) Harmful interference with other on-going space activities, including other space resource activities;
- g) Changes to designated and internationally endorsed outer space natural or cultural heritage sites;
- h) Adverse changes to designated and internationally endorsed sites of scientific interest.

## **10. Technical standards for, prior review of, and safety zones around space resource activities**

10.1 The international framework should provide that States and intergovernmental organizations shall require the conduct of a review prior to the authorization of a space resource activity to ascertain that such an activity is carried out in a safe manner to avoid harmful impacts.

10.2 The international framework should:

- a) Encourage the development of a domestic approval process to ensure that equipment, operational procedures and processes applied in space resource activities avoid harmful impacts;
- b) Encourage the development of a methodology to assess that equipment, operational procedures and processes applied in space resource activities meet common technical standards (conformity assessment);
- c) Encourage operators to develop technical standards for equipment, operational procedures and processes applied in space resource activities (standardization).

10.3 Taking into account the principle of non-appropriation under Article II OST, the international framework should permit States and intergovernmental organizations authorizing space resource activities to establish a safety zone, or other area-based safety measure, around an area identified for a space resource activity as necessary to assure safety and to avoid any harmful interference with that space resource activity. A safety zone shall not impede the free access, in accordance with international law, to any area of outer space of personnel, vehicles and equipment of other governmental, intergovernmental and non-governmental entities conducting space activities. A State or intergovernmental organization may authorize the restriction of access to a safety zone for a limited period of time, provided that timely public notice has been given setting out the reasons for such restriction.

## **11. Monitoring and redressing harmful impacts resulting from space resource activities**

- 11.1 The international framework should provide that States and intergovernmental organizations shall monitor whether any harmful impacts result from space resource activities authorized by them.
- 11.2 If a harmful impact resulting from a space resource activity occurs, the international framework should provide that the State or intergovernmental organization that authorized the space resource activity shall implement measures to respond to such harmful impact (response measures) and consider whether the space resource activity should be adjusted or terminated (adaptive management).

## **12. Sharing of benefits arising out of the utilization of space resources**

- 12.1 Bearing in mind that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and humankind, the international framework should provide that States and intergovernmental organizations authorizing space resource activities shall provide for benefit-sharing through the promotion of the participation in space resource activities by all countries, in particular developing countries. Benefits may include, but not be limited to enabling, facilitating, promoting and fostering:
  - a) Development of space science and technology and of its applications;
  - b) Development of relevant and appropriate capabilities in interested States;
  - c) Cooperation and contribution in education and training;
  - d) Access to and exchange of information;
  - e) Incentivization of joint ventures;
  - f) Exchange of expertise and technology among States on a mutually acceptable basis;
  - g) Establishment of an international fund.
- 12.2 The international framework should not require compulsory monetary benefit-sharing.
- 12.3 Operators should be encouraged to provide for benefit-sharing.

## **13. Registration and sharing of information**

The international framework should provide that States and intergovernmental organizations shall:

- a) Register priority rights of an operator to search and recover space resources *in situ* in accordance with the international framework;
- b) Give advance notification of space resource activities authorized by them through an international repository;
- c) Register space objects in accordance with the REG<sup>7</sup>, United Nations General Assembly Resolution 1721 B (XVI)<sup>8</sup>, or Article XI OST, taking into account United Nations General Assembly Resolution 62/101<sup>9</sup>;
- d) Notify frequency assignments for recording in the Master International Frequency Register in accordance with the Radio Regulations of the International Telecommunication Union<sup>10</sup>;
- e) Provide, taking into account Article XI OST and the legitimate interests of operators, information and best practices on the authorization and supervision of space resource activities authorized by them through an international repository, including:
  - i. The purposes, locations, orbital parameters and duration of space resource activities;
  - ii. The nature, conduct, and locations of space resource activities and associated logistic activities, for example deployment of stations, installations, equipment and vehicles;
  - iii. The results of space resource activities;
  - iv. Any phenomena discovered in outer space which could endanger human life or health, as well as of any indication of life;
  - v. Any harmful impacts resulting from space resource activities authorized by them and the measures planned or implemented to redress such impacts;
- f) Notify the termination of space resource activities authorized by them through an international repository together with a statement on the condition of the area where the space resource activity was carried out, including the presence of any space objects or space products, or parts thereof.

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<sup>7</sup> 1975 Convention on the Registration of Objects Launched into Outer Space.

<sup>8</sup> 1961 Resolution 1721 B (XVI) adopted by the United Nations General Assembly, International Cooperation on the Peaceful Uses of Outer Space.

<sup>9</sup> 2008 Resolution 62/101 adopted by the United Nations General Assembly, Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects.

<sup>10</sup> The Radio Regulations, edition of 2016.

#### **14. Provision of assistance in case of distress**

The international framework should provide for the applicability of Article V OST and the ARRA<sup>11</sup> to persons involved in space resource activities.

#### **15. Liability in case of damage resulting from space resource activities**

15.1 The international framework should provide for the applicability of Articles VI and VII OST and the LIAB<sup>12</sup> to damage resulting from space resource activities.

15.2 The international framework should encourage initiatives of operators to provide, individually or collectively, compensation for damage resulting from their space resource activities.

#### **16. Visits relating to space resource activities**

The international framework should provide for the applicability of Article XII OST, taking into account the legitimate interests of operators.

#### **17. Institutional arrangements**

The international framework should provide for:

- a) The establishment and maintenance of a publicly available international registry for registering priority rights of an operator to search and recover space resources *in situ*;
- b) The establishment and maintenance of an international repository, in addition to the international registry, for making publicly available:
  - i. Information and best practices;
  - ii. The list of designated and internationally endorsed outer space natural and cultural heritage sites; and
  - iii. The list of designated and internationally endorsed sites of scientific interest;
- c) The designation or establishment of an international body or bodies responsible for:
  - i. The identification of best practices;
  - ii. The listing of designated and internationally endorsed outer space natural and cultural heritage sites, and sites of scientific interest;

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<sup>11</sup> 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space.

<sup>12</sup> 1972 Convention on International Liability for Damage Caused by Space Objects.

- iii. The monitoring and review of the implementation of the international framework as well as its modification or amendment; and
- iv. The governance of the international registry, the international repository and any other mechanism that may be established for the implementation of the international framework.

## **18. Settlement of disputes**

The international framework should encourage recourse by States, intergovernmental organizations and operators to the amicable resolution of disputes, for example by developing procedures for consultation or promoting the use of the 2011 Permanent Court of Arbitration Optional Rules for Arbitration of Disputes Relating to Outer Space Activities.

## **19. Monitoring and review**

Mechanisms should be developed for monitoring implementation of the international framework, for example on the basis of reports of States and intergovernmental organizations, as well as for its review and further development (principle of adaptive governance).