Commercial Use of Natural Resources (CUR) in Outer Space: Value, Legal Challenges and a Way Forward

Guoyu Wang

Academy Senior Fellow, Chatham House, U.K. Associate Professor, Law School of Beijing Institute of Technology, China

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main questions and overview

- Whether CUR should be encouraged or not?
  - value

- Whether CUR is entitled under existing international space law regime?
  - legal challenges

- Why an international mechanism for CUR is imperative, what should it be and to which extent it will impact on development of international space law?
  - a way forward

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main points and remarks

- A state is encouraged to nurture and facilitate CUR due to its strategic value and a need of friendly-international-rules-environment;

- CUR is in a situation of (internationally) legal uncertainties, in terms of the vacancy and ambiguity of existing treaty system;

- Any individual, national, unilateral ventures has a high political risk and could likely trigger "CUR Race", which will be definitely a zero-sum game.
Instead, a cooperative joint venture model, an international mechanism is desired and necessary.

- **rationale:** cooperation; incentives; appropriate sharing
- **method:** bilateral, multilateral agreements; the Moon Agreement; new treaty for commercial use of outer space
- **contents:** specific rights, obligations and liabilities (model law)
1. The value of CUR and relevant plans

1.1 value to a state

- the need of developing a positive space strategy
  - economic strategic need
  - technological strategic need
  - political strategic need

- the need of creating a positive environment of international rule
1. The value of CUR and relevant plans

1.2 plans

- asteroid mining or lunar exploitation: ambition and announcement of private actors
  - Planetary Resources
  - Deep Space Industry
Deep Space Industry
firefly
Deep Space Industry

cubesat
Deep Space Industry
asteroid capture

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Deep Space Industry
asteroid capture
Deep Space Industry
asteroid capture
Deep Space Industry
MicroGravity Foundry
Deep Space Industry
space settlements

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Deep Space Industry
1. The value of CUR and relevant plans

1.2 plans

- official lunar or deep space project: undertaking or planning
  - NASA
  - China
  - Russia
  - Europe
  - Japan, India, UK
A NASA illustration of Option B of the Asteroid Redirect Mission, with the ARM spacecraft on the surface of an asteroid to grab a boulder. (credit: NASA)
2. CUR and legal challenges

- Whether CUR is entitled under existing international space law regime?
- Whether CUR could be granted legitimacy or justification through interpretation of and application to the existing legal framework? If so, whether the present legal system is adequate to adjust all the elements and steps of AM?
2. CUR and legal challenges

- Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.

  --Art.II of OST

- Whether natural resources falls within the scope of the prohibition, is still an open question.
- The Vienna Convention on the Law of Treaties (VCLT)
2. CUR and legal challenges

- treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.

- Art.31(1) of VCLT

  - By context
  - By object and purpose
  - By practice
2. CUR and legal challenges

2.1 By context

➢ Art. 11 of MA: negative to CUR

2. The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means.

3. Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person.
2. CUR and legal challenges

2.1 By context

- Art.6(2) of MA: (limited) positive to CUR

   2. ..., the States Parties shall have the right to collect on and remove from the moon samples of its mineral and other substances. Such samples shall remain at the disposal of those States Parties which caused them to be collected and may be used by them for scientific purposes. ...States Parties may in the course of scientific investigations also use mineral and other substances of the moon in quantities appropriate for the support of their missions.
2. CUR and legal challenges

2.2 By object and purpose

- The object and purpose of Art.II
- The object and purpose of OST as a whole
2. CUR and legal challenges

2.2 By object and purpose

The object and purpose of Art.II

"[t]he negotiating history of the Treaty shows that the purpose of this provision (i.e. Article II) was to prohibit a repetition of the race for the acquisition of national sovereignty over overseas territories that developed in the sixteenth, seventeenth, eighteenth and nineteenth centuries. The Treaty makes clear that no user of space may lay claim to, or seek to establish, national sovereignty over outer space."

---the United States delegate to UN COPUOS, Mr. Herbert Reis, on 31 July 1969
2. CUR and legal challenges

2.2 By object and purpose

- The object and purpose of Art.II
- to protect outer space from national/exclusive colonisation by States
  - commercialization is different with colonisation
  - CUR mission might require to establish a base on the target asteroid
  - a standard of prohibition here. By quantity? By size or by value?
2. CUR and legal challenges

2.2 By object and purpose

- The object and purpose of OST as a whole

- Preamble of OST
  - Recognizing the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes,
  - Believing that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development,
2. CUR and legal challenges

2.2 By object and purpose

The object and purpose of OST as a whole

Preamble of OST

- Desiring to contribute to broad *international co-operation* in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes,

- Believing that such co-operation will contribute to the development of mutual understanding and to the strengthening of friendly relations between States and peoples.

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2. CUR and legal challenges

2.2 By object and purpose

- The object and purpose of OST as a whole
  - global commons
  - common interests of all mankind
  - international cooperation

- the more participants in a AM project, the higher level the “common interests requirements” is achieved.
## 2. CUR and legal challenges

### 2.3 By practice

<table>
<thead>
<tr>
<th></th>
<th>Scientific investigation</th>
<th>Commercial untilization</th>
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<tbody>
<tr>
<td>By unilateral</td>
<td>positive</td>
<td>Never happen;</td>
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<tr>
<td></td>
<td></td>
<td>No objection--positive;</td>
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<td></td>
<td></td>
<td>Objection-negative</td>
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<tr>
<td>By multilateral</td>
<td>Should be positive</td>
<td>Never happen;</td>
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<tr>
<td></td>
<td></td>
<td>Less objection than above;</td>
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<tr>
<td></td>
<td></td>
<td>Positive result is expected</td>
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**Practice’ impact on the interpretation of Art.II of OST (figure 1)**
2. CUR and legal challenges

2.4 conclusion

<table>
<thead>
<tr>
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<th>Negative elements</th>
<th>Positive elements</th>
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<tbody>
<tr>
<td>By context</td>
<td>Art.11(2)(3), MA</td>
<td>Art.6(2), MA</td>
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<tr>
<td>By object and purpose</td>
<td>Colonization; Global commons; Common interests</td>
<td>Interests-sharing mechanism</td>
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<td>By practice</td>
<td>Unilateral commercial utilization (negative response)</td>
<td>Unilateral commercial utilization (positive response); Multilateral commercial utilization</td>
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3. an international mechanism: a way forward

3.1 The necessity, feasibility and rationale

- necessity
  - a need for new balance
  - a need of order: vacancy of current international space law--orderly development of activities
  - unilateral behavior; CUR Race; Zero-sum game; prisoner dilemma
3. an international mechanism: a way forward

3.1 The necessity, feasibility and rationale

feasibility

• Paragraph 5 Article 11 of the Moon Agreement
• technical feasibility
• market demand
• strategic needs
• legal feasibility
• principle of equality
3. an international mechanism: a way forward

3.1 The necessity, feasibility and rationale

- **rationale**
  - cooperation
  - incentive
  - appropriate sharing

- **balance; tradeoff**
3. an international mechanism: a way forward

3.2 Approaches (stepwise)

- to clarify rights and obligations through bilateral or multilateral agreements;
- to clarify rights and obligations through joining and amending the Moon Agreement;
- to clarify rights and obligations through joining treaties on commercial activities in outer space
3. an international mechanism: a way forward

3.3 Basic contents

- orderly, secured, reasonable and fair principle for CUR
- notification, consultation, negotiation and environmental protection;
- ownership, the right to use and privileges; the contents should also provide for the duty of care of predecessors and newcomers;
- responsibility determination approaches and dispute resolution measures

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thank you!
any comments and questions