A COMMONS VIEW

Global Commons or Common Resource and Heritage to Preserve for Future Generations

BY COL (RET) PAT FRAKES

Recently there has been much discussion of the concept of global commons as it applies to the domain of space. Drawing from our collective experience with the more familiar land, sea and air domains, we tend to draw analogies to space hoping to develop a common understanding of this domain. While analogies can be helpful in identifying key issues, their utility quickly erodes when applied to issues with significantly different underlying conditions. This point was apparent early on when it comes to space:

"… [T]he principles and procedures developed in the past to govern the use of air space and also the sea may provide useful analogies. However, many problems of outer space will be unique in character."[1]

Space is different – physically and politically than the other dominions. The strategic context in which human activity in space began has changed dramatically over the last five decades. The situation in which we find ourselves today demands a more comprehensive view of the domain and human interactions therein based on our experiences. Enduring principles first articulated by the Eisenhower Administration served us well and remain present in policy today. These include the principles that outer space is freely available for peaceful exploration and use by all and the right of operations in space without interference.[2]

While these foundational principles enabled the enormously successful and peaceful growth in the utilization of space, we are now confronted with new challenges which require a broadly accepted understanding of space. The global commons concept is an attempt to create this understanding, but the vagueness of the concept and the variety of ways in which it has been applied to space leave many people questioning its validity. On its face, the term global commons seems to be an accurate description for the space domain, but continued success requires a shared view of the key attributes of the domain and the responsibilities placed on those who choose to derive benefits from it.

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A cursory search for the term "global commons" yields many definitions. From The Oxford Pocket Dictionary [2009], a global common is "any of the earth's ubiquitous and unowned natural resources, such as the oceans, the atmosphere, and space."[3] Another definition from the United Nations says that global commons are "any natural assets outside national jurisdiction such as the oceans, outer space and the Antarctic."[4] Some of the key attributes in these definitions are scope, appropriation and governance. The "ubiquitous" scope of global commons implies that scarcity, or competition for resources, is not likely. Appropriation of a common by any nation, group or individual is not possible and behavior in the common is governed by existing international law. An ideal common is assumed to be a vast resource in comparison to the demands placed upon it. Each individual in a common acts based on self interest, deriving benefits from the common. All will naturally seek to maximize individual benefit and, since the common appears infinite to the individual, will continually place greater demands on it. No management or cooperation mechanisms are necessary, as all derive benefit without competition. Following this line of thinking to its extreme, Garrett Hardin, in his essay "The Tragedy of the Commons," describes the inevitable destruction of a common resource when demands placed on it eventually exceed capacity. Each individual will continue to place demands on the common since the marginal benefit to the individual will always be greater than the marginal cost.[5] Avoiding such a tragedy requires recognition of the limitations of the common and a change in thinking between a resource as a global common to the concept of a resource as a common heritage of mankind. The common heritage of mankind concept, originally introduced in international law through the Outer Space Treaty, "… holds that defined territorial areas and elements of humanity's common heritage – cultural and natural – should be held of trust for future generations and be protected from exploitation by individual nation states or corporations."[6] This concept makes a resource universally available yet recognizes its finite limits and potential for harm due to human action. Common heritage of mankind places a stewardship responsibility upon all to maintain the value of the resource for future generations. This view requires an active and fully participatory management or cooperation regime. It shares many attributes with an ideal global common; however the attribute of scarcity imposes constraints upon users' activities if they desire to sustain the domain for future use.

While the entire domain of space may be ubiquitous, the portion primarily used by humans is quite small in comparison. Nearly all space-based activities take place between low earth orbit – beginning approximately 200 kilometers above the Earth's surface – and just beyond geostationary orbit approximately 36,000 kilometers above the Earth's surface. There are, of course, exceptions, but the principal area in which we face challenges today is limited in scope to that described above. And, as codified in the Outer Space Treaty, space "… is not subject to national appropriation …" and "… shall be free for exploration by all/States … in accordance with international law … ."[7] These statements confirm in international law that space cannot be owned and human activities shall be conducted in accordance with the international legal regime. The enduring

principles of U.S. National Space Policy are entirely consistent with these statements and helped to facilitate the substantial growth of space systems for security, exploration and commercial applications throughout the world. Resulting improvements in technology, miniaturization and reliability have reduced the cost of access to and utilization of space for all. Today there are 64 nations, consortia and businesses operating[8] over 900 satellites[9] in space. In addition to these operational satellites, over 14,000 pieces of non-functioning debris[10] resulting from over five decades of space activities remain in earth orbit. In a sense, we are the victims of our own success in that the increase in the number of groups operating space systems and the corresponding orbital debris present new challenges to the continued growth and utilization of the space domain. In order to address these challenges, additional principles are necessary to account for the demands being placed on this limited domain.

In addition to the foundational principles established in U.S. space policy, attributes derived from the common heritage of mankind concept are needed to ensure sustainable growth in the space domain. These attributes include individual stewardship and shared management. Individual stewardship consists of compliance with the applicable international legal regime, acceptance of additional burdens to sustain the domain, and active coordination as a responsible member of the community. The United States complies with the applicable legal regime regarding space and was the driving force behind the development and international acceptance of voluntary debris mitigation guidelines. These guidelines reflect current best practices designed to mitigate the creation of long-lived orbital debris in order to improve spaceflight safety. Implementing these guidelines increases the complexity and cost of space systems, but reduces risks to all others. Additionally, the United States currently tracks over 20,000 objects in Earth orbit, about 1,000 of which are active payloads,[11] and makes the positions of these objects available to the world at no cost in order to enable coordinated operations and promote the safe and responsible use of space.

As the number of space systems continues to grow, improved coordination will be increasingly necessary to avoid potentially harmful interference. Currently, utilization of the geostationary belt, also known as the Clarke Belt, is managed by the International Telecommunications Union. This particular area, a circular ring 36,000 kilometers directly above the earth's equator, is unique in that satellites placed in this belt appear to an observer on the earth to remain stationary. This physical artifact of orbital mechanics makes the geostationary orbit particularly useful for telecommunications and wide area broadcast applications. In this regard, there is a high demand for placing satellites in this region. In order to mitigate the potential for harmful physical and electromagnetic interference, the International Telecommunications Union created a process for users to secure the rights to particular locations, designated by geographic longitude, and register their electromagnetic frequencies so that owner-operators may reduce the possibility of interference with nearby spacecraft.[12]

There are no similar processes for other orbital regimes; satellites are placed in the other orbital regimes based on the best knowledge and judgment of the launching entity. Unfortunately, one of the beneficial aspects of the space regime, the fact that satellites can remain in relatively predictable orbits for long periods of time, also presents an increased risk of collision as the number of objects increases. This risk is compounded as satellites become inoperable and remain in orbital regimes populated by operational satellites. This danger dramatically manifested itself on Feb. 10, 2009 when an active Iridium communications satellite and a non-operational Russian military satellite collided at an altitude of about 750 kilometers. The collision generated thousands of pieces of debris, most of which will remain in low earth orbit for years and will continue to place operational satellites at risk.[13] This is the first indication of a potential "tragedy of the commons" scenario and a forcing function for expanding active coordination to all orbital regimes.

Enabling sustainable growth and avoiding the "tragedy of the commons" in the space domain requires responsibilities to accompany the rights articulated as foundational principles in U.S. national space policy. The following statement summarizes a proposed shared view:

> The domain of space is a common resource of humankind. All responsible parties have the right to access and operate in this domain without interference and in accordance with international law. With this right comes the responsibility to conduct activities in such a way as to: 1) minimize the possibility of interference with activities of other responsible parties; 2) ensure sustainable growth for all responsible parties; and 3) continually improve the coordinated utilization of space for all responsible parties.

In the near term, concrete steps which will move all nations closer to achieving these goals are:

- Universal acceptance of the international legal regime regarding space (the Outer Space Treaty, Rescue and Return of Astronauts and Objects, Liability Convention and Registration Convention)
- Acceptance of the above view of the space domain in respective national policies
- Acceptance and codification of Voluntary Debris Mitigation Guidelines in national regulatory documents
- Commitment to contribute appropriate information regarding space systems registered by a nation to a shared

repository in order to develop a fundamental coordination mechanism for current space operations and planning for future space activities

- Establishment of an organization representing all nations conducting space activities which has the technical competence and commitment of members to optimize current and planned space activities with the goal of sustaining the environment for future generations

None of the above actions are intended to preclude a nation from exercising its sovereign right to develop and deploy space systems essential for its security. Should it be necessary for nations to operate space systems outside the structure described above, the burden for safe and responsible use must be borne solely by that nation as a responsible member of the community. The fundamental principles established early in the history of human space activities established a solid foundation for all nations to benefit from space-based services and products. Building on this foundation, acceptance of a shared view of the domain by all nations, with its concomitant rights and responsibilities and an aim toward sustainable development, will ensure that the value of space remains available for future generations.

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BIO

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