2.6 Political and Legal Rationale

There are many possible benefits to creating new laws and policies to govern the settlement of the Moon. Given that the Moon has special status as the "common heritage of all [hu]mankind," (UNOOSA, 1979), settlement on its surface would not be bound by any legal precedent, unlike resource utilization in Antarctica or drilling for oil on the high seas. The building of a habitat, telescope, or mining the Moon by a nation is of concern, whether or not these activities prevent other States from accessing the Moon

This section will follow a similar structure to Section 2.1-2.5 above. However, instead of individually responding to the reasons not to go, the response to the political and legal critiques of returning to the Moon will be consolidated into one section, Section 2.6.3, as the response to the critiques in this section are consolidated into two key recommendations: (1) to update existing policy, and (2) to establish a body responsible for monitoring the compliance of space actors to policies regarding the Moon.

2.6.1 Political and Legal Rationale for Going

2.6.1.1 Policy Spin-Offs

Similar to spin-offs in technology, the legal framework created for developing the Moon in a sustainable manner could be applied to Earth, both in terms of governing places that are considered nationless, like Antarctica, and in terms of adapting responsible resource utilization frameworks. The Earth has suffered from unsustainable development and numerous conflicts over natural resources, so the development of a legal framework for the Moon may set the necessary precedent for restructuring the existing laws regarding resource utilization on Earth.

2.6.1.2 Development of teamwork models for the Moon could be applied directly on Earth

The ISS has five major partners, all of which send astronauts with different societal, workplace, and personal cultures. These astronauts work together to conduct ground breaking research, despite occasional intercultural conflict stemming from different cultural approaches to leadership, followership, and group living (Burke and Feitosa, 2015). The partnership models that have been implemented on the ISS, as well as confined space simulations such as the Hawaii Space Exploration Analog and Simulation (HI-SEAS), ensure the highest output efficiency of the international teams. This could be applied to international co-operations and projects on Earth, especially those occurring within the space sector (Johnson and Suedfeld, 2019).

2.6.2 Political and Legal Arguments Against Going

2.6.2.1 The legality of resource utilization is unclear

The law governing beyond the Earth's atmosphere is composed of a Magna Carta of five treaties including the 1967 Outer Space Treaty and the 1979 Moon Agreement. Although none of them explicitly addresses the exploitation of resources, the Moon Agreement was supposed to be a step forward in addressing this issue. However, it is perceived by many as a failure and was only ratified by only 18 countries, not including any of the space faring nations. The main debate questions whether the phrasing "use of outer space" in Article I of the OST allows for the exploitation of resources (Tronchetti, 2009).

Article II of the OST outlines a principle of non-appropriation of the Moon and other celestial bodies in order to maintain

peace and cooperation in outer space.

However, some argue that the principles of non-appropriation concern space in general or its natural resources (Tronchetti, 2009). This argument stems from the debate between the terms *res nullius,* meaning that a resource or land does not belong to anyone but all can use it, and *res communis,* which means that the land or resource belongs to everyone and cannot be appropriated, even by a State.

2.6.2.2 The Moon's status as common heritage of humankind is not universally agreed upon

One of the reasons the Moon Agreement was not ratified by the space faring nations lays in Article 11 which declared that the natural resources of the Moon were a "common heritage of [hu]mankind" and that it was necessary to establish a regime capable of regulating its exploitation. It is precisely the term "common heritage of [hu]mankind" that divides states, because the various works that led to this article were intended to privilege developing countries in the sharing of the exploitation of resources.

The USSR then declared not recognizing the notion of "common heritage of [hu]mankind" as proposed by UN Doc A/AC.105/196 Annex 1 (United Nations, 1997). The Moon Agreement remained general as to the creation of a regulatory regime for the exploitation of space ressources. The structure of such an organization, or its power and functioning, were not specified. This divergence explain why many in the space sector considered this treaty as a failed step towards regulated the use of celestial bodies.

2.6.2.3 The requirements of current space law can be perceived as unreasonable

The international space treaties establish that all nations have rights to lunar resources. This means that any attempt to exploit these resources would need the approval of all countries. Such a process would be slow, and prone to diplomatic and economic pressures. For now it is unclear if the exploitation of lunar resources is illegal or not, some national disposition are taken to authorize it but on the international level, the debate is still strong. Space could then become a place where tensions about exploitation would render peaceful exploration impossible.

2.6.2.4 Access to space is discriminatory

Article 3 of the Declaration on Space Benefits (United Nations, 1996), is supposed to give equal access to space, with a focus on ethical access for developing countries. However, access to space is still discriminatory because the majority of developing countries do not possess the means to have a space program. Moreover, regarding the exploitation of space resources, once a resource is extracted it becomes the property of the extractor (Lintner, 2016). Since the current space faring nations have a significant advantage in terms of reaching the Moon and extracting resources first, developing countries will be additionally disadvantaged in claiming property rights on the Moon.

2.6.2.5 There is a lack of political will for cooperation

Current laws like the Chinese Exclusion Policy impede the effective collaboration between spacefaring nations, clearly showing a lack of political will for international cooperation. In fact, current collaborations are coming to an end, as shown by the end of the Soyuz contract for the transportation of astronauts to the ISS, which will be replaced by contracts for American companies. This could leave to a movement away from the strong international cooperation between the U.S and Russia regarding space activities, with NASA administrator Jim Bridenstine recently quoted as saying the following with regards to a SpaceX launch:

"Today's successful launch marks a new chapter in American excellence, getting us closer to once again flying American Astronauts on American rockets from American soil"

(Bridenstine and Gerstenmeir, 2019).

The development of national space laws such as the US Space Act of 2015 or the Luxembourg law on Exploration and Utilization of Space Resources of 2017 are declaring the legality of resource extraction before an international legal framework is established.

2.6.2.6 There is a lack of legal framework to ensure the protection of the lunar environment

The Committee on Space Research (COSPAR) has argued that the protection of the Moon and other celestial bodies under the current planetary protection framework is insufficient. However, this argument is centered on protecting human interest in scientific investigation (Garber, 2012), as opposed to protecting the Moon from an active modification of its environment. Therefore, the laws governing what steps must be taken to protect the lunar environment are extremely vague. While this report will attempt to provide some actionable guidelines for sustainable lunar development, found in Section 4, which includes environmental protection, a firm legal framework is needed.

2.6.3 Response to Reasons Not to Go

Unlike the previous sections where mitigation techniques were provided to counter every objection, there are only two appropriate mitigation techniques for all the concerns outlined in Section 2.6.2 above, which are to: (1) update the existing space policy and legal framework governing the settlement of the Moon, and (2) establish a governing body responsible for enforcing the rules and regulations surrounding lunar settlement.

2.6.3.1 Update the Existing Space Policy

A new Moon Agreement could rectify the lack of clarity resulting from the failed Moon Agreement of 1979. Such an agreement would address the concerns outlined above, namely: (1) the utilization of lunar resources, (2) the establishment of property rights, (3) cooperation between states, and (4) planetary protection. Even without establishing hard law, soft policy guidelines such as the ones discussed in Section 4 (Lunar Sustainability Goals), which establish standards and consensus on the above topics are necessary to ensure that the use of the Moon is equitable and sustainable.

For (1) and (2), the establishment of property rights gives an important legal framework to extra-atmospheric space. It is important to reach an agreement that would allow a combination of the concepts of non-appropriation of territory and property rights regarding natural resources. Indeed, States have expressed interest in space resources, the legalization of appropriation would give an important legal framework but also attract investors.

Thus, the creation of two legal regimes, one concerning the non-territorial appropriation (or an object that cannot be detached from its soil) and the other concerning the property rights of natural resources (an object extracted from its territory of origin and movable becomes the property of its extractor), would allow the respect of previously signed treaties (including the Moon Agreement to a lesser extent)

and give the green light to private and public investors for the exploitation of extra-terrestrial natural resources (Lintner, 2016).

It is prudent to establish an international consensus where States and private actors establish the rules for the use and commercialization of the natural resources of the Moon. One possible guide is the regulation regarding the high seas, which reduces risks of pressures and conflicts, and works quite well today. While some may complain that creating a comprehensive legal framework would be expensive and that it would slow down the evolution of the sector, investing time in creating a legal base would ultimately ensure states and private actors legitimacy in the exploitation of the resources (Brünner and Soucek, 2011).

For (3), agreements should be reached regarding planetary protection, which show the will of nations to protect the environment of the Moon to a reasonable standard without prohibiting the use of lunar resources. While the development of sustainable technology will certainly aid in planetary protection, some degree of consensus on the matter may encourage industry to innovate in order to meet international standards.

For (4), it would be beneficial to incorporate articles that establish equity between developed and developing countries in order to re-enforce the resolution 51/122 of the UN General Assembly (United Nations, 1996). According to this declaration, "All States, particularly those with relevant space capabilities and with programmes for the exploration and use of outer space, should contribute to promoting and fostering international cooperation on an equitable and mutually acceptable basis. In this context, particular attention should be given to the benefit for and the interests of developing countries and countries with incipient space programmes stemming from such international cooperation conducted with countries with more advanced space capabilities."

Finally, States should be invited to take steps to regulate their national space activities and the activities of their partner States, taking into account their international obligations, so that private ventures are held responsible for their activities.

2.6.3.2 Create a governing body to enforce regulations concerning lunar settlement

The assignment of property rights over the extra-terrestrial territories could create tensions between States and private actors, as it would be a race for their acquisition, on a first come first served basis. Therefore, the establishment of a regulating organization of space resource activities could serve as a liaison between nations in order to ensure fair and equitable access to resources. While nations could regulate themselves through treaties and agreements, having an external observer could make the entire process of managing the Moon more objective, and less subject to the relative political power of various states.

This is not a new idea. In 1999 at the UN Conference for Peaceful Use of Space, it was proposed to create a governing organization of outer space activities called the International Space Authority. Such an organization would regulate the use of the resources in the form of a license granted to applicants, and would also settle disputes between governmental and non-governmental entities. This organization, in the manner of the World Trade Organization, would be open to all and would have the capacity to extend its skills or modify them.

2.6.4 Political and Legal Rationale Summary

The creation of policy is not a reason to go to the Moon in itself. However, in order to support the other rationales explored in this section, robust policy must be created to guide space actors towards ethics of sustainability and cooperation. It is also necessary to mitigate the risks that are posed by the

somewhat unclear regulations regarding resource extraction and settlement on the Moon that are a reality of existing space policy. The Lunar Sustainability Goals detailed in Section 4 offer a broad pathway to developing a sustainable lunar base through soft policy recommendations, and the rationales and responses discussed in Sections 2.6.1-2.6.3 are summarized below in Table 2.10.

Table 2.10. Summary of Policy Rationale

Rationale for Going	Arguments Against Going	Responses
Creation of new policy can be adapted to be applied to Earth situations: ● Sustainability regulations ● Use of the Antarctic	The legality of resource utilization is unclear The Moon's status as "Common Heritage of all [hu]mankind" is not universally agreed upon The steps that need to be taken in order to ensure compliance with current law are unreasonable Access to space is discriminatory There is a lack of political will of cooperation There is insufficient legal framework to ensure the protection of the lunar environment	Update the Existing Space Policy regarding: ● The utilization of lunar resources ● The establishment of property rights ● Cooperation between states ● Planetary protection Create a governing body to enforce regulations concerning lunar settlement

2.7 Purpose Conclusion

The sections above have presented a thorough and diverse set of rationales for going to the Moon, and have offered responses to common critiques of lunar missions. At the heart of the matter, what is important is how lunar missions are beneficial for people on Earth. It will be a long time before there is substantial human presence on the Moon, which will be discussed in the Roadmap section of this report, but there will be substantial investment from all sectors of society in lunar missions from the very beginning. Therefore, it is critically important that space missions are helping Earth-bound humanity reach its goals.

It is similarly important to establish a sustainable Moon presence to ensure that the benefits outlined above continue to benefit humanity on Earth. In Section 4, Lunar Sustainability Goals which could help space actors incorporate sustainability into their missions are outlined, and in the following section, the roadmap by which a lunar base could be sustainably established in support of the above rationales will be explored.