Space Diplomacy as A Way to Face The Era of Space Commercialization in Indonesia

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ABSTRAK - Dalam perkembangannya, kegiatan antariksa telah melalui beberapa tahapan. Diprakarsai oleh peluncuran pertama satelit ke luar angkasa hingga penggunaan antariksa untuk kegiatan komersial. Semua kemajuan ini disubsidi oleh pengembangan teknologi dan kerangka hukum internasional dalam mengatur kegiatan antariksa. Negara-negara telah berkomitmen untuk saling bekerjasama untuk tujuan damai dalam menggunakan antariksa yang telah dinyatakan dalam lima perjanjian internasional tentang antariksa. Sebagai negara berkembang khatulistiwa dengan lokasi geografis yang menguntungkan, Indonesia memiliki keinginan yang kuat dalam menguasai dan menerapkan ilmu dan teknologi antariksa. Konsisten dengan tujuan utamanya yang termaktub di dalam Undang-Undang Antariksa Indonesia; untuk meningkatkan kemandirian dan daya saing Indonesia di bidang antariksa dan untuk menggunakan antariksa untuk memberi manfaat bagi penduduknya dan untuk meningkatkan produktivitas nasional. Dari berbagai kegiatan antariksa seperti ilmu antariksa dan penginderaan jauh yang telah dilakukan oleh Indonesia, komersialisasi dalam hal antariksa adalah area yang memiliki potensi dalam berkontribusi terhadap tujuan-tujuan yang telah dituliskan. Makalah ini bertujuan untuk menganalisis peran diplomasi Indonesia dalam menyiapkan peluang bagi peningkatan kegiatan komersial di antariksa dengan harapan dapat menutup kesenjangan antara negara maju dan berkembang dari kemajuan bidang antariksa yang begitu cepat. Makalah ini menggunakan penelitian hukum normatif dengan pendekatan konseptual dan komparatif.

Kata Kunci: Diplomasi Antariksa, Komersialisasi Antariksa, Hukum dan Hubungan Internasional

ABSTRACT *- In its development, outer space activities have gone through a few stages. Initiated by the first launch of satellite to outer space up to the use of space of commercial activities. All of these progresses is subsidized by technological development and international legal framework in governing space activities. States have committed to cooperate amongst each other for the peaceful purposes of outer space declared in the five main international outer space treaties. As a developing equatorial country with specific geographical location, Indonesia has a steady desire in mastering and applying space science and technology. Consistent with its primary aims enlisted under the Indonesian Space Law; to improve Indonesia's self-sufficiency and competitiveness in the area of space activities and to use space to benefit its population and to increase national productivity. Out of the various space activities such as space science and remote sensing that has been conducted by Indonesia, space commercialization is an area that has potentials in contributing to the aforementioned goals that has been brushed off. This paper aims to analyse the role of Indonesian diplomacy in setting up opportunities for space commercial improvement in hopes of closing the gap between developed and developing countries of rapid outer space advancement. This paper uses a normative legal research with conceptual and comparative approach.*

Keywords*: Space Diplomacy, Space Commercialization, Law and International Relations*

1. INTRODUCTION

1.1. Background

Indonesia has every interest in conquering space science and technology, along with its utilization for the national development and prosperity of its people. Despite the initial enactment of the Indonesian Space Act as an effort to ensure national conduct meets international obligations while balancing national interest (Froehlich, Annette and Seffinga, Vincent, 2018). There are four substantial rationale behind the Indonesian Space Law enactment. First, outer space, as an area of activities, media, and natural resources, shall be used peacefully to apprehend national interest as prescribed in the 1945 Indonesian Constitution. Second, for Indonesia's archipelagic nature, lying on the equator making it as a disaster-prone area. Third, in addition to the geographic location, it is likely that other states will be interested to internationally cooperate in space activities from the Indonesian Territory. Last, the national space legislation that existed at that time was inadequate to govern space activities.

The development of Space Law in Indonesia, including the formulation of national space act, and its enactment, shall take into consideration national interest, international obligations, and present and future development of space activities, including the trend of commercialization and privatization of space activities (Supancana, I.B.R., 2006). Economic activity also depends on space technology for data communication and so on (Djamaluddin, Thomas, 2014). Indonesia has been building a domestic communications infrastructure using satellites since the 1970s (Supancana, I.B.R, 2006), and currently have nine satellites operating including those used in commercial communication and for research purposes.

The origin of human enterprise in space goes back to competition between the Soviet Union and the United States (Hampson, Joshua, 2017). The pinnacle for the conclusion of the 1967 Outer Space Treaty came about for the concern that geopolitical rivalry and nuclear arms race between the two superpowers. To which extent each country would respect other's space vehicles and astronauts, no claims over sovereignty and celestial bodies, and neither would station weapons of mass destruction. Most importantly for the commercial use of outer space, each would assume responsibility for the actions of their private individuals and companies in outer space. Space commercialization encompasses space related technologies, capabilities and services, both space-based as well as ground-based, that are generally exploited to generate revenue by governments and aerospace companies (Jasani, Bhupendra, 2013).

So far, Indonesia's space commercial activities only extend to telecommunication services, satellite imagery, and potential launchers (Jones P, Zachary, 2014). Indonesia's earliest cooperation tracks back to the *Tropical Earth Resources Technology Satellite* with the Netherlands (Mayerchak, Patrick M., 1989). On one side, the government are expected to actively establish and develop space technology, while private sectors are to promote the commercial activity (Megah, Muhammad, 2012). From an ideal point of view, this cooperation is somewhat mutually symbiotic. The issue that arises is when the state refuses to cooperate with private sectors for space commercial activities for the reason that it is not feasible and relevant to the country's national development (Lyall, Francis, 2009). Developing countries must cooperate with advanced super powers if they expect a reasonable return on investment. One of the current challenges for Indonesia is re-balancing the domestically-driven foreign policy with a more active engagement (Sukma, Rizal, 1995).

Space diplomacy, a term that today, envisages a new connotation given by the space community, it brings the idea of formulating and implementing practical initiatives so that interests of States are convergent in space and also it is the art of negotiating to coexist peacefully in outer space for the future of human kind (Arellano, Ramirez De , 2016). For decades, space diplomacy has been the instrument to establish important provisions when it comes to reducing threatening developments in space. To keep it that way, as International community, our role should be, more than ever, active and prepositive. Global challenges and technology make us step up the pace of our initiatives aimed at using outer space in a sustainable manner. Space diplomatic engagements should not be seen as a means to prevent freedom of national actions or programs, as long as they are geared towards peaceful purposes and comply with space law.

Indonesia as part of International space community has played its role in space diplomacy. In 1998, DEPANRI held National Aerospace Congress. The congress was attended by numerous aerospace stakeholders and produced several important documents, one of them was about policy on aerospace international cooperation (Thomas Djamaludin,2014). The ratification of four out of five International space treaty and conducted numerous bilateral and regional space agreements with other countries (Mardianis,2014) are the real evidence from the Indonesia's space diplomacy. Nevertheless, the progress or development of Indonesia's space diplomacy still needs numerous improvements. It doesn't mean that the Indonesia's diplomats or ambassador have failed in playing their role as diplomats but it needs cooperation from several institutions in Indonesia in order to put their focus and attention in developing its space diplomatic policy.

The purpose in developing space diplomatic policy is to achieve the goals of Indonesia's space activities which has been written in Indonesia's space act number 21 of 2013 about Outer Space and Indonesia's Presidential Decree number 45 of 2017 about National Space Development Master Plan. Nevertheless, there are several challenges in achieving those goals. Definitely, Indonesia has send several satellites into outer space and also involved in several regional and international space forums but it still cannot follow the rapid development in Outer Space issue particularly in space commercialization. In terms

of the future challenges in space commercialization in Indonesia, it is not only talk about the lack of space infrastructure, cooperation in national and international level and human resources who capable and master in this respect but also Indonesia shall pursue the massive lag in space commercialization with the state which have advance technology, infrastructure and policies in space commercialization issue.

1.2. Problems Formulation

a. What are the future possibilities for Indonesia in developing space commercialization?
b. What are the importance of space diplomacy for Indonesia's space commercialization development?

1.3. Research Objectives

a. To find out the future possibilities of space commercialization in Indonesia;
b. To analyse the appropriate space diplomacy options for Indonesia's space commercialization development.

1.4. Research Methodology

This research use normative legal research with conceptual and comparative approach.

2. THEORETICAL FRAMEWORK

2.1. Involvement of Private Companies in Space Commerce

Private enterprise participation and influence in space commerce can be in the form of either direct or indirect involvement. For example, private company's indirect involvement as a service provider or subcontractor of the state and also providing insurance and financing (Boeckstiegel, K.H., 1988). Another example by private enterprise is where private industry operates as a purchaser of the outcome of space actions carried out by the state or a state establishment. Domestic law determines this relationship between the private body and the state.

Direct involvements can be applied in activities such as remote sensing and substances dispensation happening on board orbiting space facilities. More recent and contemporary involvement of private company are from space transportation, space communication including direct television broadcasting and other types of specialized telecommunication services (Vitale, Salvatore, 2009). The levels of private company's involvement range from full ownership, to more limited titles of right or relationships.

2.2. Developments of Space Commerce Activities and its Policies in the United States and ASEAN States

2.2.1. United States

i. Launch Services

For expendable launch vehicles (ELVs), the United States have introduced a licensing method. Consistent with Article VI of the Outer Space Treaty where the government promises protection to fulfil with global compulsions (Marshall, H.R., 1985). This is to fulfil the idea of 'authorization and continuing supervision', which conclusively stipulated a "Commercial Space Launch Act" where authorization is handed over to the Secretary of Transportation. Every licensee must either show monetary responsibility or get legal responsibility insurance for third-party claims in a quantity of the maximum likely loss. Every launch supplier must get insurance to cover the utmost likely loss to government property. The Secretary has to decide the utmost possible loss in talking with NASA Administrator, Secretary of the Air Force, and the heads of other suitable companies.

ii. Remote Sensing
Remote Sensing in the United States is stipulated under the Land Remote Sensing Commercialization Act of 1984. The Act sets up the cooperation between Federal Government and Private companies to additional development of a land remote sensing structure. A certain level of government knowledge must be sustained to warrant that private division actions are in the national interest and that the global commitments and policies of the US are respected.

iii. Communications via Satellite
The initial contribution of private industry takes its first step from the Comsat Act since 1962. The vital position of private enterprises dominates communication services in the U.S. Prior to this, communications in the US were conventionally offered by private industries, working on common communication carriers, under government rule. The beginning of new satellite equipment became more relevant for the goal of a better international communication network, which ignites the Comsat Act.

iv. Broadcasting by Satellite Directly
The idea of Direct Broadcasting Satellite to home recipients by encouraging widespread contribution in the new form of communication motivates a lot of private companies to be given permission to build direct broadcasting satellites. However, the US still adheres to the International Telecommunications Convention that offers guidance for broadcasting by direct satellite.

v. Substance development in Space
Substance development in space is where the manufacturing of pharmaceuticals, semiconductors, fibre optics, particular metals and the development of crystals. This activity is governed by the National Aeronautics and Space Act of 1958. It is suggested that substances giving out actions completed on board space crafts under the U.S. Authority will obtain the same treatment as substances developing actions completed inside the U.S. (Dula, A., 1985).It is expected that private industry will play more of an active role when business accomplishment turns out to be more apparent.

2.2.2. ASEAN

Global government spending on space is around $72.9 billion in 2012. A notable portion of increase was driven by developing countries across the Global South and Southeast Asia besides the dominant emerging space powers such as the United States, Europe, Russia, China, Japan, and India.

i. Malaysia
Telecommunications and broadcasting have been a large sector for space applications for the development of Malaysia's economy. MEASAT, (Malaysia East Asia Satellite) became fully commercial in 1998 under MEASAT Satellite systems, which has grown to operate a fleet of five satellites offering services worldwide from its centre in Cyberjaya and control centre on *Pulau Langkawi* (Moltz, James Clay, 2012). Malaysia also sought to raise its profile in space by promoting public support for space investment through its astronaut program, as part of a defence acquisition from Russia. a Malaysian orthopedic surgeon, Dr. Sheikh Muszaphar Shukor, was trained and flown to the International Space Station (ISS) for ten days in 2007. Malaysia devotes its space application with a highly market-based, and commercial application of space activities toward broader socioeconomic development.

ii. Thailand
Thailand's first of six commercial *Thaicom* geostationary communications satellites was launched in 1993 under a "30-year domestic Communications Satellite Operating Agreement" established in 1991 by the Ministry of Transport and Communications. After a series of reorganizations, Geo-Informatics and Space Technology Development Agency (GISTDA) was formed and since 2008, Thailand operated the Thailand Remote Observation Satellite similar to the Indonesian Palapa Series. Thailand has actively maintained regional leadership in space

services by strengthening training for its space industry, creating international and domestic cooperation between GISTDA and domestic universities.

iii. Singapore
Singapore's citizenry is among the world's wealthiest and best-educated, led by the dominant Lee family's People's Action Party (PAP) which dictates close ties between commercial, civil, military programs, and Research and Development. Singapore's commercial-academic role contributes highly to its economic wealth and human capital.

iv. Philippines
Philippines' space activity and affairs are coordinated between various government agencies and the private sector on a number of research and space technology applications despite it not having a formalized space agency (Daphne Burleson, 2005). The main focus of Philippines' space activities such as remote sensing, astronomical and atmospheric services, and communicates are all driven by commercial provider (Noichim, Chukeat, 2008).

2.3. Indonesia's Cooperation in Space Commerce Milestones

Indonesia's early cooperation with the United States was through the commercial contract of Palapa A-1, B-1, B-2, and B-3 from U.S Companies such as Boeing and Hughes. The Palapa telecommunications series was paired with deals for construction of the accompanying control and receiving stations, along with remote sensing Landsat signals. The receiver's capability was improved by 1990s to include French SPOT and European ERS-1 capabilities in views to diversify Indonesia's remote sensing sources. The last offer Indonesia accepted from cooperation with the United States was to fly an Indonesian Astronaut, but it was aborted.

Before 1989, Indonesia received an offer from China, in cooperation with Singapore, to build an $800 million commercial launch pad on Gag Island. This project never materialized, because Indonesia's aspiration to develop its own launch capability would have been undermined by a joint venture and the tensions with China for backing the abortive communist coups of 1960s.

The LAPAN-A series beginning with TubSat is one of the most recent space architecture indispensable for Indonesia's economic contribution, as its commercial-academic cooperative technology transfer with Germany Facilitates domestic construction of the subsequent satellites in the series.

Indonesia also hosts a telemetry station for the Indian Space Research Organization (ISRO) Further diversifying its suppliers when PT Telekomunikasi favoured of a joint contract with Russia's Reshnetev and French-Italian Thales Alenia Space Consortium for its Telekom-3 Satellite over the U.S. commercial providers. Which then in 2009, Indonesia deviated from the Russian, to choose over a cheaper launch with China which failed to reach geostationary orbit, costing five years off the satellite's service life to correct the mistake. Thus, learning from its mistakes, Indonesia then chooses to again work with a U.S company to construct a telecommunications satellite for launch aboard a European Ariane 5 in 2016 (de Selding, Peter B., 2014).

2.4. The Background and Purpose of Space Diplomacy

Diplomacy, in its traditional sense, is the dialogue between States. This understanding has been analysed since the classic study by Harold Nicolson of 1939 (Nicolson, Harold, 1939) then via the still valuable book by Adam Watson (Watson, Adam, 1982) through to the Oxford Handbook of Modern Diplomacy (Cooper, Andrew F., 2015). According to these authors, diplomacy has to be distinguished from international relations as a whole, or the foreign policy of a State. Diplomacy is therefore defined as the process of dialogue and negotiation between States. Today, the restrictive definition of diplomacy is getting blurred and an overlap with international relations can be seen (Rana, Kishan S., 2011). Currently, further attempts are made to adapt the concept of diplomacy to the internet age and the growing role of non-governmental actors in international relations (Bjola, Corneliu, 2015)

When we look at space law, a first phase can clearly be identified where the most traditional notion of diplomacy applies. It is the period of the negotiation and adoption of Outer Space Treaty, Agreement on Rescue and Return of Astronauts, Space Liability Convention and Registration of Objects Launched into

Outer space Convention covering the early 1960s to the mid-1970s.The substance of the diplomatic dialogue was characterized by the search for answers to basic questions related to the use of outer space: the status of outer space (including the still unresolved definition and delimitation of outer space), the determination of actors in outer space, the setting of rules on how to interact in outer space, and the setting of limitations for the actors in outer space. For the purpose of an ordered diplomatic dialogue, a special forum, the United Nations Committee for the Peaceful Uses of Outer Space (UNCOPUOS) was established after the Sputnik flight. But it was more a balance between multilateral and bilateral diplomacy that led to the space treaties, as its well-analysed drafting history demonstrates: (Jasentuliyana, Nandasiri, 1979) the diplomatic axis of multilateral diplomacy in UNCOPUOS was overlaid by the bilateral axis of U.S.-Soviet Union negotiations as the only space powers at that time.

COPUOS is by far, the international forum with the mandate to bring States together to minimize the inability or unwilling to implement key recommendations for strengthening space activities and make them priority in the national political agendas. COPUOS was created in an uncertain political environment precisely for the purpose of generating and promoting international collaboration in the peaceful use of outer space. Today, it is the forum that "gives life" to international space law, which sets the tone to design their space policies and, at the same time, expose needs and propose initiatives for ensuring space cooperation (Ramirez De Arellano,2016).

One very specific international arrangement should be included in this assessment of how early - and still basic - international space law was determined by the context and practices of diplomacy. Even if at first glance does not appear to fit, the Intergovernmental Agreement for the International Space Station (ISS-IGA) of 1998 should be included. This is the first broadly international, nonregional, agreement on creating and maintaining an infrastructure other than satellites and satellite systems in outer space. It is again dominated by the U.S. and Russia (the original Space Station approach was without the Soviet Union/Russia). It was set up at a time of detente, and today still has to face another period of confrontation Looking at diplomacy in the early space age, drawing the line to the ISS-IGA and extending it to future global exploration endeavours can provide valuable insights on how the two axes of bilateral diplomacy (where the main negotiating partner of the U.S. might also change from Russia to China or Europe, or be a mixture of those), and multilateral diplomacy (UNCOPUOS or other) can work, interact or compete (Kai Uwe-Schrogl, 2016).

2.5. The Status of Indonesia's Space Act

Historically, space activities in Indonesia started in the early 1960s. At the beginning, space activities focused on rocket research and development. In 1963, sounding rockets built by Indonesia and Kappa rockets were successfully launched from *pameungpeuk* rocket launching station which located in West Java. Furthermore, in the early 1970s, space activities were suspended due to political situation. After was suspended several years in 1970s, the space activities continue to increase within the broader spectrum, focusing on space applications. In 1980s, several programs which related to space science and technology such as Research and Development (R&D) effort has been intensifying in order to support of space applications. In 1993, the Indonesian national space development program was firmly spelt out in the 1993-1998 Guidelines of State Policy which approved by the Indonesian People's Consultative Assembly. The purposed of the national space development emphasis on to improve the welfare of all Indonesian people, by the mastery of space science and technology and through human resources development. The one essential aspect of this national space development program is the element of cooperation with other countries (Mardianis,2014). Indonesia as developed country actively in developing their space technology and also involving in several International forum concerning outer space law. Indonesia has operated nine satellites into outer space, six communications satellites and three satellites for researching, in which, located in Geostationary Earth Orbit (GEO). Subsequently, In regards to the Regional or International agreements, Indonesia currently ratified four of the core space treaties among others Outer Space Treaty 1967, Rescue Agreement 1968, Liability Convention 1972 and Registration Convention 1978 (Supancana, I.B.R, 2006).

Through the all of activities above, Indonesia government considered to provide legal framework for the existing and emerging space activities in Indonesia. Eventually, in 2013 Indonesia government agreed to issued Law Number 21 year 2013 about Outer Space. This act covered all space activities which occurred in Indonesia. Also, this act allowed all Indonesian people and Indonesian legal entities involved or participated

in developing this respect. Beside focusing in developing space activities independently and aimed to create the welfare of the nation, this act also allowed and encouraged to conduct International cooperation either bilateral, regional or multilateral.

3. FACTS

The unique location of Indonesia that resides between the two continents and oceans makes it difficult to control its sovereignty over the land, sea, and even the space. With the basis of Flight Information Region (FIR) a designated by ICAO, not all the space above Indonesian territory are controlled by Indonesian. Moreover, a specific bilateral agreement between Singapore and Indonesia empowered the FIR division that the space area over Riau islands are under control of Singapore. The rest of the space area over Indonesia have been divided by two FIR: the east region of Indonesia is controlled by FIR in Ujung Pandang and the west region of Indonesia is controlled by FIR in Jakarta. This divisions are actually not accordance with the Chicago Convention 1944 on International Civil Aviation's main philosophical basis that every state has complete and exclusive sovereignty over the air space above its territory.

The existence of the bilateral agreement between Indonesia and Singapore in fact has been resulting problems and difficulties in controlling the air traffic services surrounding the space over Riau islands. This includes the issue of economic disadvantage and national security. Although there has no actual amount of losses from the economic side, Indonesia suffers actual loss to have independent management in order to provide fast and easy for its own air traffic management. Such independent management also reduces the civil aviation risk and increase the passengers safety.

In the side of national security, Indonesian air force lost its own control to monitor and to conduct air patrol over the Riau islands since these activities must be under approval from the Air Traffic Control from Singapore. There were some occasions that Indonesian's military aircrafts faced difficult to take off at Batam's airport, Riau islands because of the approval bureaucracy that has to be followed as stipulated under the bilateral agreement between Indonesia and Singapore.

Indonesian's defense system equipment plays important role in order to have independent control the space over the country. However, the existing fact shows that the defense equipment still far behind the neighboring countries. Starting 2016, the government intends to augment the air force by purchasing advanced defense technology equipment's. Human resources at the Indonesians air force need also to be developed.

4. ANALYSIS

In awakening of commercial use of outer space, activities was limited to communication, and remote imaging starting in the 1990s (Digital Globe, 2010). at the start of 2000s, new commercial actors began to enter the space arena, beginning with space launch services (Hampson, Joshua , 2017). The use of outer space is no longer limited to states, but private entities plays a more active role for the growing development of space commerce. The growth of private launch services and commercial satellites becomes an interesting observation, particularly for developing countries such as Indonesia. Where the policy and regulation are still relatively fresh, and questions over the role of the Indonesian government whether or not take part in overseeing commercial actors in outer space.

4.1. Potential Opportunities for Developing Space Commerce in Indonesia

Public-private partnerships are common in the space economy, and can be an effective method for overcoming barriers such as high capital requirements, technology risk, and longer development timelines. These barriers can prevent establishment of viable and valuable commercial space capabilities. Public-private partnerships can take several forms, but typically involve some co-investment between government industry, government anchor tenancy, or some combination thereof (Bryce Space, 2013).

Amongst many sectors and trends of commercial activities, considering Indonesia's characteristics as an equatorial state, with its current status and progress of space development, and cooperation that it has built with its partners, and taking in to account of the National Space Development Master Plan, these are some of the arguably suitable potential opportunities for Indonesian space commerce.

a. Launchers
   The potential arrival of new cost-effective launchers is currently largely based on governmental investments. Today's commercial satellite market is not sufficient to sustain current space launch systems or justify industry investment in new systems and technologies. Government support is necessary for the foreseeable future to achieve national objectives in the security, civil and commercial sectors. The following factors should be considered by the Indonesian government for the evolution of commercial space launch, such as; international economic conditions, continued launcher and satellite industry consolidations, increased satellite life time, national regulatory environment.

b. Telecommunications
   The space industry is marked by stiff competition among commercial firms to secure orbital locations for satellites and to secure the use of radio frequencies to exploit a global market for goods and services provided by those satellites. Two key factors should affect positively satellites' telecommunications future developments and lead the way for new integrated services; Essential communicating tools for the information society, and the increasing need for broadband internet.

c. Earth Observation
   The main customers for earth observation derives data should still remain governmental agencies; especially the ones dealing with security aspects in the broadest sense (e.g. defense, natural disaster relief efforts), while the private sector demand (e.g. oil and gas industry) is likely to remain cyclical. Therefore, the strong public good element to earth observation should offset somehow the lack of enthusiasm from the private sector. Enhanced monitoring capabilities are essential for early warning of environmental changes, regardless of whether those changes are natural or human induced. Remote sensing is certainly a key contributor to the ability to monitor, and therefore oversee, how human activities are interfacing with the various types of environments on which they locally depend (Michel Andrieu, 2004).

4.2. The Steps that Should be Taken by Indonesia in Order to Create those Opportunities by its Space Diplomacy

As we acknowledged, Indonesia has actively involved and participated in many International space forum. The purpose from this participation was to propose Indonesia's idea or interest concerning space activities in international level. In regards to the participation of Indonesia in International Space forum. Historically, Indonesia has joined in United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) since 1973 through General Assembly Resolution Number 3182 (GA RES, 1973). Since the participation of Indonesia in UNCOPUOS, Indonesia ran actively involved in promoting the uses of outer space for peaceful purposes. Since then, Indonesia have ratified four core of space treaties and conducted several bilateral and regional agreements with other countries. Those actions which taken by Indonesia government was in line with the concept of Space Diplomacy which explained by Ramirez de Arellano in which the space cooperation shall be uphold.

The development of Indonesia's Space diplomacy was fluctuated. It caused by the unpreparedness of Indonesia government in developing its space activities. Indonesia government needs put more attention in developing this respect. Before Indonesia government conduct its space diplomacy in International level. It shall be started within the Indonesia government itself. Indonesia government shall conduct coordination intra-institution concerning the development of Indonesia's space activities. In short, Indonesia government shall be converging its State interest in space. Space diplomacy can be use as a weapon by Indonesia government in proposing its policy or interest concerning space activities. In the era of space commercialization, space diplomacy it really needs by Indonesia government to develop this sector. The geographical asset that owned by Indonesia is an advantage in proposing its interest before International space forum. China and India are the examples of state which developing its space activities particularly space commercialization through space diplomacy. In May 2017, India launched the GSAT-9, also dubbed

the South Asia Satellite, aiming to provide space-enabled services to other South Asian countries. This initiative is part of New Delhi's broader effort to demonstrate India's rising global stature and the progress of its space program, while also bolstering the country's neighborhood diplomacy, enhancing regional cooperation and connectivity, and improving service delivery (Shounak Set, 2017).

Through space diplomacy, India and China can run smoothly in developing its space commercialization sector. Definitely, the strengthening of space diplomacy shall be followed by the development of space infrastructure. Both of components shall be run together. If its need, Indonesia government shall reformulate its foreign policy particularly in space sector. Actively involve in UNCOPUOS and many International space forum are not enough if Indonesia government do not have any attention in developing its space activities.

5. CLOSURE

5.1. Conclusion

Space commercialization essentially needs two aspects for its development, national government and private sectors. Because even though the private sectors have the financial and technological capabilities, if an accident or damage occurs, the state will be held liable. Therefore, it is imperative for cooperation between the state and private sectors. In order to increase growth in the launch industry, private companies and the states are ought to cooperate in developing commercial spaceports-sites used for commercial space launches. In other side the role of space diplomacy is necessary to realized the space commercialization project in Indonesia. Indonesia Government shall reformulate their foreign policy particularly concerning space activities. Indonesia Government shall keep an eye in Space interest in order to propose its space diplomacy in international level.

5.2. Recommendation

In order to improve the opportunities and possibilities for Indonesia's growth and development and commercializing its space sector, the government must Facilitate an environment that enables increased space commerce investment. Increase Indonesian Government use of commercial space goods and services. Reduce legal, policy, and institutional impediments to space commerce along with promoting growth in the export of space related goods and services. Most importantly, increase communication between the Indonesian Government, commercial space actors, media, and the general public on space commerce issues

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