

## Research Viewpoint

### Indonesian Space Activities: The Long and Winding Road

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#### Abstract

From early 1963 until 2022, Indonesian space activities saw numerous breakthroughs in space technologies, law, and policies, but also multiple challenges, the majority of which were caused by internal political issues. Indonesian space operations can be classified into three epochs: (1) the old order, (2) the new order, and (3) the reformation era. Prior to the reformation era, the most stable environment for Indonesian space development since state policy has strengthened national space infrastructure existed. However, following the political turbulence in 1998, Indonesia's space program has been stalled since the start of reformation administrations, indicating that space initiatives are not a priority. Nonetheless, in the 2000s, Indonesia took a significant step by acceding to four of five international space treaties, significantly altering the course of the Indonesian space program. Indonesia has aspired for space technology independence, and to that end, in 2013, it enacted Law No. 21 of 2013, which paved the way for the Indonesian Space Activities Master Plan 2016-2040 for national space development. Although Indonesia has a defined long-term plan for space program development, the government's political and financial inconsistencies remain a significant impediment. This paper explores Indonesia's national space development policy and the prospects for achieving the country's space development goals by 2040.

#### Introduction

Indonesia is the one of the few states in Asia that established its space programs in the 1960s, marked with the launching of Kartika-I rocket and the establishment of National Institute of Aeronautics and Space (LAPAN). As a new-born state at the time, Indonesia had ambition to maximize its natural and human resources for the sake of its younger generations. To achieve those objectives, the Indonesian government, at the time, sent Indonesians to study abroad to learn about space technology or other fields related to space technology, mostly to the United States and the Soviet Union. As an archipelagic state with more than 17,000 islands, stretching from 95°- 141° to 6° North to 11° East, space technologies particularly in telecommunication and security aspects would enable those islands to connect with each other.

In the course of its implementation, Indonesian space activities have faced many challenges and constraints in terms of ever-changing national policies, legislation, and budgets, leading to inconsistency. In addition, the Indonesian government and LAPAN have no robust, long-term

strategic plan, which slows down the Indonesian space program, resulting in unclear space program objectives. Further, LAPAN has very limited national government budgetary allocations. However, the Indonesian space program was enlightened after the enactment of Law No 21, known as the Indonesian Space Act 2013, which governs the development of the Indonesian space program and harmonizes between *Corpus Juris Spatialis* and national regulations. Article 40 of the Indonesian Space Act 2013 mandated the government to establish long-term space activities, a strategic plan, and the Indonesian Space Activities Master Plan 2016-2040 (ISAMP 2016-2040).

In 2021, there was volatility in the implementation of ISAMP 2016-2040 when the Joko Widodo Administration announced the creation of the National Research and Innovation Agency (BRIN) through Article 48 of the National System of Science and Technology Act 2019, Article 121 Omnibus Law on Job Creation 2020, and Presidential Decree No. 78 of 2021 concerning BRIN. The primary reason in creating BRIN is to merge all research institutions, including LAPAN, into BRIN. The merging process itself raises legal issues and creates tensions between the government on one hand and engineers and scientists that are part of the space program on the other hand. This posits challenges for the implementation of ISAMP 2016-2040.

Additionally, with the promulgation of Presidential Decree No. 78 of 2021, the definition of “Institution” in the Indonesian Space Act 2013 was altered. In this case, the term Institution no longer refers to LAPAN, but rather just to BRIN, which serves as the organizer of Indonesian space programs. Nonetheless, BRIN continues to use the name LAPAN as a recognized brand for its partners and as a part of the Aviation and Space Research Organization identity (ORPA LAPAN). As a result, ORPA LAPAN is currently focusing exclusively on aerospace research, while the administration, law, and cooperation affairs are handled by other directorate generals within BRIN, including LAPAN’s role as the Indonesian Space Agency, which is currently being transferred to BRIN. This institutional development is an issue regarding LAPAN’s representation in international forums, such as the United Nations Committee on the Peaceful Uses of Outer Spaces (UNCOPUOS), Asia-Pacific Regional Space Agency Forum (APRSAF), and the Asia-Pacific Space Cooperation Organization (APSCO). Differing interpretations arise since the Indonesian Space Act 2013 only mentioned “Authorized Government Body” to conduct aerospace and outer space research without referring to any specific body. This paper examines the evolution of Indonesia’s space policies and their activities in the context of these developments within the three eras, namely (1) old order, (2) new order, and (3) reformation. The starting point for the inception of Indonesian space activities began since 1963 with the establishment of LAPAN.

### **Space activities and policies prior to the enactment of Indonesian Space Act of 2013**

Outer space is seen by Indonesia as a medium, natural resource for the prosperity of the Indonesian people in a peaceful manner to achieve the national objectives set out in the 1945 Constitution. The exploration and utilization of space is essential in this context. Space science and technology is characterized by high cost and risk, though beneficial in terms of social and economic wellness, defense, and security. Space systems, which include Earth based technology, space segment, and users, should also be integrated into research, development, and use per Indonesian national objectives.

The importance of space activities is reflected in space systems, which provide information and services capable of protecting life and the environment, improving well-being and security, and stimulating science and technology for industrial and economic development. Space activities provide weather forecasting, satellite and global navigation, as well as new possibilities for remote education (tele-education) and long-distance health services (telemedicine). Space activities also

have the capacity to improve the economy and other development sectors. It has become a global concern, with specific benefits and new challenges, such as monitoring and understanding climate change and global warming, and advancing sustainability.

To strengthen space technologies, drawing on the impetus of the International Geophysical Year 1957-1958, Indonesia started to actively seek and develop rocket technologies as early as 1963<sup>1</sup>. It resulted in, at the time, *Pengembangan Roket Ilmiah dan Militer Awal* or PRIMA project, which successfully launched the Kartika-I rocket along with the S-I project<sup>2</sup> as part of the cooperation between LAPAN and Indonesian Air Forces (AURI), under cooperation with Hideo Itokawa<sup>3</sup> for the S-I project to build its rocket technology. These successful rocket launches were considered the second after India in Southeast Asia.<sup>4</sup> However, political turmoil in 1965 and the September 30 movement of the Indonesian communist party and anti-Soekarno military officers led to the fall of the old order by 1967. This halted the ambitious space program Indonesia had initiated.

In 1963, the Indonesian Aeronautics and Space Council (DEPANRI) was established with the primary task to arrange and form national space policy. DEPANRI had held two successful plenary sessions in 1994 and 1998.<sup>5</sup> During its first session in 1994, DEPANRI formulated a long-term Development Second Phase or (LtDS-II), namely to establish national guidelines for the national aerospace system including outer space, to bolster aerospace and space industry capabilities, to advance research and development, and to enhance human resources capability on aerospace and outer space technologies for peaceful purposes, including non-offensive military and defense purposes.<sup>6</sup>

In 1967, Soeharto rose to power in what is commonly known as the new-order era. Under this new-order regime, space activities continued to develop, as shown by the Siprus Project, which stood for Real Time Information System by Aircraft and Satellite,<sup>7</sup> and the establishment of Aerospace Research Pioneer (ARP) by LAPAN in cooperation with French national space agency, *Centre National d'Etudes Spatiales* (CNES), to bolster rocket launching facility for ionosphere research.<sup>8</sup> Along with Siprus and ARP, Indonesia cooperated with Lockheed Martin in the United States in 1974 (at the time, the aerospace company was Martin Marietta) to build Indonesia's first satellite called Palapa-A1. Furthermore, in line with Palapa-A1, the Indonesian government also built an Earth ground station in *Jatiluhur*, which acted as Domestic Satellite Telecommunication System (DSTS). DSTS was the first one in Southeast Asia and third one globally after the United States and Canada.

The Palapa A1, which was launched in 1976, is the pioneer satellite in Indonesia that led to the development of seven other satellites through mid-1990s. As a country geographically situated around the equator line between two continents and oceans, Indonesia depends on the use of space technology and seeks a comparative advantage in managing its national program pertaining to space activities. Space program developments in Indonesia encouraged other states to sign mutual international cooperative agreements. The Indonesia government has established mutual agreements with the government of the Russian Federation on Cooperation of the Exploration and Use of Outer Space for Peaceful Purposes in 2006, the Cabinet of Ministers of Ukraine on Cooperation in the Exploration and Peaceful Uses of Outer Space in 2008, the People's Republic of China on Cooperation in the Exploration and Peaceful Use of Outer Space in 2013, and the Government of the Republic of India on Cooperation in the Exploration and Uses of Outer Space for Peaceful Purposes in 2018.

From 9 November to 3 December 1976, Indonesia along with Brazil, Congo, Zaire, Uganda, and Kenya met in Bogota, Colombia with the purpose of studying the geostationary Earth orbit

(GEO) that corresponds to their national terrestrial and sea territories, which these states considered as their natural sovereign resources.<sup>9</sup> This meeting, also known as the Bogota Declaration, led to soft law that these states adopted on 3 December 1976 with respect to sovereign claims of GEO over their national territories, and called for a more equitable use of the orbit for developing states.<sup>10</sup> This effort was only supported as far as equitable use is concerned, and not supported in regard to sovereign claims. Further, Indonesia signed and ratified the Outer Space Treaty (OST) in 2002, which explicitly prohibits national appropriation of outer space.

After the Indonesian National Armed Forces Law No. 34 of the Year 2004 (INAFL 2004) replaced the Indonesian Defense and Security Law No 20 the Year 1982 (IDSL 1982), the Indonesian Air Force's scope of work is limited solely to Indonesian Air Space and not outer space. The now-revoked IDSL 1982 mentioned that one of the Indonesian Air Force's main duties was to secure the Indonesian air and outer space domains, inter alia GEO, for the sake of the national interest. At that time, Indonesia had been broadening its military range into outer space for strategic functions such as protecting Indonesian satellites from any threat. GEO protection arose when IDSL 1982 used *Dirgantara*, which means all areas in the context of air and outer space,<sup>11</sup> instead of using *Udara*, which exclusively refers to air space. The readjustment in INAFL 2004 came about after the National Aerospace Congress of 1998, which involved essential air and space experts, adjusted Indonesia's position of interest in outer space and in GEO according to international law (e.g., OST) and development;<sup>12</sup> This implied that the Indonesian government excluded GEO claims of the Bogota Declaration in its national space program. Moreover, the Indonesian Space Act of 2013<sup>13</sup> formally aligned international space law to national policy and legislation.<sup>14</sup>

In 2003, Indonesia had a draft of the Indonesian Space Act, which raised the concerns of many stakeholders from government agencies, academia, and the private sector. This draft place LAPAN with responsibility to coordinate within government bodies for its law, policy and technical matters, and its harmonization to Indonesian legal system is part of the Ministry of Law and Human Rights (*Kementerian Hukum dan HAM* or *Kemenukham*).<sup>15</sup> The Indonesian Space Act of 2013 has a wide spectrum and advances national space legislation, which included *Corpus Juris Spatialis* incorporated into Indonesian national interest. The Indonesian government has ratified four out of five *Corpus Juris Spatialis*. In 1996, the government ratified the Convention on International Liability for Damage Caused by Space Objects of 1972 (Liability Convention) through Presidential Decree No. 20 of the Year 1996. Subsequently, in the following year, the Convention on Registration of Objects Launched into Outer Space (Registration Convention) was ratified in accordance with Presidential Decree No. 5 of the Year 1997. Then, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Rescue Agreement) of 1968 was ratified in accordance with Presidential Decree No. 4 of the Year 1999. Significantly, as the Magna Carta of space law, the Treaty on Principles Governing the Activities of States in Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967 (Outer Space Treaty, OST) was ratified in 2002 through Law No.16 of the Year 2002. The Moon Agreement of 1979 is the only agreement that is yet to be ratified by Indonesia.<sup>16</sup>

## **Legal framework and implementation challenges**

*Space Act of 2013*

The major challenge with Indonesian national space activities development exists in politics. During the President Soeharto's regime, Indonesia had capability in space technology. This continued until his deposition in 1998; ever since, national space activities have been both advanced and thwarted due to political factors (like a "long and winding road"). At the beginning of President Habibie's regime, after Soeharto's deposition, science and technology development were focused on the aviation industry with PT *Dirgantara Indonesia*. National space activities started to raise again towards the end of Habibie's incumbency. Afterwards, in the presidencies of Abdurrachman Wahid, Megawati Soekarnoputri, Susilo Bambang Yudhoyono, and Joko Widodo there has been fluctuations and inadequate sustainability in Indonesia's national space activities.

At the same time, the first Aerospace Congress in 1998 raised the discussion about the urgency of national law to serve as an umbrella provisions for the national space activities. It is necessary to develop the law of space as an instrument to implement the national space policies to manifest the national interests, to work as a tool of social engineering, to promote the use of space for national development, to protect public interest, and to promote international cooperation.<sup>17</sup> The journey started in 2003 when the first draft for the law of space was finalized by a public consultation meeting on 12 December 2003 in the presence of relevant stakeholders.<sup>18</sup> Generally, this first draft contained background, purposes and objectives, identification of problems, theoretical study and evaluation, as well as harmonization and synchronization to the existing laws and regulations. The draft also included relevant international legal instruments, scope of coverage, and issues to be regulated.<sup>19</sup> There was as well a comparative study between the proposal with the national law of outer space from different states. It was relevant herein to highlight the common elements usually entrenched in the national law of outer space. As such, Indonesia's national law of outer space represents a standardized provision. The comparative analysis was also important to help Indonesia consider different models of national space legislation.<sup>20</sup>

Indonesia's national law of space is tailored to meet the needs and desires from its citizens within its geographical jurisdiction without violating Indonesia's international obligations. To improve the draft quality and obtain input from various government agencies, an interdepartmental working group was formed and organized by LAPAN. The first draft was regularly reviewed and updated. The harmonization process was performed under the supervision of the Ministry of Law and Human Rights. Approval from the related ministries followed thereafter, before finally sent to the President. The President submits the proposal and explanatory note on the draft to the Parliament.<sup>21</sup>

Overall, it took 10 years to deliberate and enact the national space legislation from the first draft. This period was due to the political constrains among the national authorities, which slowed down the finalization of the Indonesia's Law of Space of 2013. Besides, several national stakeholders in the institutional aspect needed to first unite their power in the process of constructing the law. The mentioned problems among the stakeholders caused difficulties in updating the space program planned by LAPAN. Though, regulatory, technology, and budgetary factors show that Indonesia is capable to emerge as second-tier space power. The key issue for the Indonesian space program lies in obtaining consistent support from the government and in overcoming political factors discussed herein rather than technology.

The first draft law consisted of 16 chapters and 51 articles, while the final draft presented to the Parliament was consisted of 21 chapters, 105 articles, and an addition of explanatory notes. The deliberation process in the Parliament was conducted with the initial meeting between the Executive Body and the Legislative Assembly (Parliament). There was a total of 571 issues in the inventory, 366 of which remained unchanged. Nonetheless, the discussions on the draft initially

divided the Working Committee and the Formulation and Synchronization team. There were 137 substantial issues, among others penal sanctions that must be harmonized with Indonesia's penal code, which is under discussion by the working committee since December 2003. The public hearings were executed before the deliberation process with the participation of experts from the relevant fields. At this point in time, there were two new issues raised and discussed during the public hearings concerning the marketing and export control. Finally, on 9 July 2013, the Parliament approved the draft law during its Plenary Session. The law was signed by the President within 30 days thereafter, and was enacted in the form of Law No. 21 of 2013 concerning National Space Activities.<sup>22</sup> Under Article 40 of the Indonesian Space Act 2013, the government elevated ISAMP 2016-2040 to bolster national space capabilities. Indonesia is the first state in the Southeast Asia or also known as ASEAN -- this includes Indonesia, Malaysia, Singapore, Vietnam, Cambodia, Myanmar, Lao PDR, Brunei Darussalam, Philippines, and Thailand -- to implement its own national space legislation.

#### *Indonesian space activities Master Plan 2016-2040*

As mentioned earlier, the Indonesian Government mandated ISAMP 2016-2040, which has been regulated through Presidential Regulation No. 45 of 2017. The Indonesian government intends to strengthen space technology capabilities and reap additional benefits from space commercialization through this plan. ISAMP 2016-2040 has classified Indonesia's space development into timelines and categories. Timelines include short term targeted for 2020; middle term targeted for 2030; and long term is targeted for 2040. The categories include space science; remote sensing; mastery of space science and space technologies (rocket and satellite technology); aeronautics; launching; and space commercialisation. Indonesia intends to concentrate its efforts in the short term on developing capabilities in space and atmospheric data centers, rocket development, and the operation of the LAPAN A-4 satellite. The capability to design remote sensing satellites will be developed in the medium range. The capability to launch low Earth orbit (LEO) satellites from Indonesia will be developed in the long term.

One challenging ISAMP 2016-2040 goal entails planning to build a spaceport in Biak, Papua that could fully operate for launching to LEO for government and private use, and in drafting an environment impact assessment of the planned Indonesian spaceport.<sup>23</sup> Due to turbulence on LAPAN-BRIN merger in 2020-2021, and the lack of coordination and limited resources this process is, so far, going nowhere. Furthermore, information on ISAMP 2016-2040 goals are inaccessible to the public causing the goals themselves to be unmonitored under public accountability. ISAMP 2016-2040 has plans to build a rocket that could carry small satellites to LEO, but this plan is also challenging since Indonesia is not part of Missile Technology Control Regime (MTCR) and *Wasenaar* Arrangement.<sup>24</sup> In Article 27 of Indonesia Space Act 2013, the government intends to meet on international standard on transferring and securing sensitive technologies.<sup>25</sup>

To achieve these goals, Indonesia should have mother institution with capability to coordinate governmental bodies. DEPANRI is considered to have had capabilities for this, however, in 2014 DEPANRI has been dissolved through Presidential Decree No 176 of 2014.<sup>26</sup> Without the existing of DEPANRI and LAPAN as two major government bodies on aerospace and outer space, future Indonesian space policy will be questioned under BRIN. Could then BRIN replace DEPANRI and LAPAN? This is explored next.

#### **Bureaucratic reform of national space activities and policy**

In 2021, President Joko Widodo announced a plan to integrate research institutions in the Indonesian government dealing with space activities into a special research institution, known as BRIN. Regarding this plan, it was stated in Article 48 paragraph (1) of *Undang-Undang Sistem Nasional Ilmu Pengetahuan dan Teknologi* or National System of Science and Technology Act (UU SINAS IPTEK) that, “To carry out Research, Development, Assessment, and Application, as well as Inventions and Innovations, a national research and innovation body is formed.” This is reaffirmed in Article 121 of Law No. 11 of 2020 concerning Job Creation. To carry out the mandate of the law, President Widodo issued Presidential Regulation No. 78 of 2021 concerning BRIN. Presidential Decree No. 78 of 2021 is used as the basis for the integration of several national research institutions into BRIN. Some of these research institutions include the Indonesian Institute of Sciences (LIPI), the National Nuclear Energy Agency (BATAN), the Agency for the Assessment and Application of Technology (BPPT), and LAPAN. Article 1 of Presidential Decree No. 78 of 2021 further strengthens the legitimacy of BRIN as an integrated national research institution. The mandate of BRIN is to conduct research and development, undertake studies, advance technology innovations and applications, and implement nuclear energy and integrated space activities. President Widodo hoped that the process of integrating research institutions into BRIN could be carried out no later than one year after the enactment of Presidential Decree No. 78 of 2021.<sup>27</sup> Yet, internal strife, community rejection, and the impact on the performance of research institutions are all part of this integration process. These factors will likely slow down the integration process. Moreover, LAPAN’s duties and functions to BRIN could be extended for technical reasons, regulatory readiness, and maturity.

LAPAN, as one of the research institutions that will be integrated into BRIN, is also affected by this process. Previously, LAPAN was a non-ministerial research institution directly accountable to the President for Indonesian space activities. Upon integration, LAPAN will become an Aeronautical and Space Research Organization, subordinated to and accountable to BRIN, responsible for technical research, development, study, and application, space management, as well as inventions and innovations in the field of aviation and space. LAPAN, which is supposed to focus on developing national space technology and activities, is preoccupied with bureaucratic politics because of its integration into BRIN. Naturally, this will influence national space activities and policies. In addition, the integration of LAPAN into BRIN requires harmonization of regulations related to outer space. Among them are Law No. 21 of 2013 concerning National Space Activities; Presidential Regulation No. 49 of 2015 concerning the National Institute of Aeronautics and Space; Presidential Regulation No. 78 of 2021 regarding BRIN; and Regulation of the National Research and Innovation Agency No. 5 of 2021 entailing the Tasks, Functions, and Organizational Structure of Aviation and Space Research.

Article 1, Paragraph 18 of Indonesian Space Act 2013 defines “Institutions as Government Agencies that conduct government affairs in the fields of aerospace research and development, as well as space administration”. This must be reaffirmed following LAPAN’s integration into BRIN. Who is the Institution referred to in Article 1 paragraph Indonesian Space Act 2013? Is LAPAN an institution governed by Presidential Decree No. 49 of 2015, BRIN an institution governed by UU SINAS IPTEK 2019, or the Aviation and Space Research Organization governed by the National Research and Innovation Agency's Regulation No. 5 of 2021 concerning the Aviation and Space Research Organization's Tasks, Functions, and Organizational Structure?

Given that Presidential Decree No. 49 of 2015 regarding LAPAN remains valid today, it is affected to the existence of LAPAN as a non-ministerial government institution that is responsible to the President. Even though Article 1 of Presidential Regulation No. 78 of 2021 states that, “the

National Research and Innovation Agency, hereinafter abbreviated as BRIN, is a government institution reporting to the President in conducting research, development, study, and innovation.” Thus, it appears that the overlapping regulations governing space administration institutions in Indonesia have not been resolved following LAPAN’s integration into BRIN, and the subsequent need for regulatory harmonization in this area is also lacking.

Additionally, in accordance with Presidential Decree No. 49 of 2015 on LAPAN, what is the *Organisasi Riset dan Penerbangan Antariksa* or ORPA status under BRIN? As a result, it becomes critical to reach an agreement on regulatory harmonization following LAPAN’s integration into BRIN. Beside institutional polemics, it will have ramifications for the performance of institutions charged with overseeing national space activities, including the implementation of the ISAMP 2016-2040. As noted earlier, ISAMP implementation is governed by Presidential Regulation No. 45 of 2017, which states, “Heads of institutions responsible for government affairs in the field of space administration shall synchronize and coordinate with ministers in preparing government work plans based on the 2016-2040 Space Plan referred to in paragraph (2).” Again, who is intended as the institution's head in this article? Is the Head of LAPAN? Or, does the Head of BRIN or ORPA, which share the same responsibilities and functions?

If this is not clear, it will certainly have an impact on the development of technology, activities, and Indonesia's national space policy. Recently, the Head of BRIN legally formed the Secretariat of the Indonesian Space Agency with duties as Liaison Officer and National Focal Point for Indonesia in the affairs of the administration of Indonesian space at intergovernmental and nongovernmental space organizations. This institution is referred to as Indonesian National Space Agency (INASA-BRIN). The institution was formed within BRIN as the main research institution in Indonesia. Either it will be a simplification of an organization or it will become enmeshed in bureaucratic politics given the size of the organizational structure of BRIN.

The establishment of INASA-BRIN has the potential to create misunderstanding for domestic and international stakeholders who have, or wish, to establish cooperation with the Indonesian government in the field of space. This is only complicated further in that LAPAN is known as the Indonesian Space Agency in international fora. With the formation of INASA-BRIN, the international community will have to decide whether there is a distinction between LAPAN, an Indonesian Space Agency that has existed for a long period of time, and INASA-BRIN. Besides the confusion over BRIN, there is a problem of law and politics regarding bureaucratic reforms in simplifying the bureaucratic area to be more accessible, transparent, and effective, and in cutting unnecessary processes that could delay the growth of investment sectors, including space activities.

The “integration” word in Article 48 Paragraph 1 of UU SINAS IPTEK 2019 and Article 121 Omnibus Law on Job Creation states, “on purposes for research, Development, Assessment, and Implementation as well as integrated invention and innovation are established through National Innovation and Research Agency.” If referring to Articles 13, 14, 42, 60-67, 70, and 79 of UU SINAS IPTEK 2019 integration, BRIN will be a coordinator agency for non-research purposes or solely for an administrative agency of LAPAN, BPPT, BATAN, and LIPI.<sup>28</sup> Further, such integration has been interpreted *in sensu lato* in the explanation area of UU SINAS IPTEK and Omnibus Law on Job Creation by adding *inter alia* before the integration word, causing misinterpretation and misconduct on integration, and resulting integration issues. Otherwise, BRIN is solely a research agency in Indonesia by integrating all research agencies into BRIN.<sup>29</sup> This interpretation, and followed by Presidential Decree No. 78 of 2021, has made BRIN non-effective and contrary to the “simplification of bureaucracy” of the Widodo Administration. This



will directly affect Indonesian space activities in the future, notably the implementation of ISAMP 2016-2040. As a result, regulatory harmonization is required to avoid redundancy and uncertainty following the integration of LAPAN into BRIN.

## Conclusions

Indonesia has a long history with dynamic changes in its space activity development. Unlike other states in Southeast Asia or also known as ASEAN, which have been successful in strengthening domestic space capacity, Indonesia is still finding its appropriate path. Continuing to overhaul national space policies and legislation will lead to incoherence and imbalance in national space activities. Furthermore, three of four *Peraturan Pelaksana* or Implementing Regulations remain unfinished; these are important to Indonesian Space Act 2013 implementation supporting Indonesian space activities. BRIN has the burden to finish the Implementing Regulations as soon as possible to achieve ISAMP 2016-2040 goals.

The dissolution of DEPANRI in 2014, BRIN's establishment in 2020, and LAPAN merging into BRIN in 2021 are key political issues to Indonesian space development. Current development has shown the Indonesian government to be incoherent in supporting national space activities. In the future, the Indonesian Government should be more consistent in avoiding policy changes that could directly affect Indonesian space activities.

The incoherent nature of Indonesian space activities is caused by inconstant policy from each Indonesian President even though Indonesia has enacted guidance through Law No 21 in the year 2013 and ISAMP 2016-2040. Stakeholders and policy makers should be concerned with developing independencies in space technologies for Indonesia. Despite LAPAN's integration into BRIN, legal issues affect Indonesian space activities, primarily in the implementation of ISAMP 2016-2040 pertaining to program target execution in a timely manner. Clearly, the integration and the changes of Indonesian space organization structures through the establishment of BRIN must be finalized to guarantee Indonesian future space activities with coherence and consistency.

## Notes

<sup>1</sup> I.B.R Supancana, *Indonesian Space Policy, Regulations and Programs: Past Achievements and Future Prospects*, ed. Q. Verspieren, *ASEAN Space Programs*, (Singapore: Springer, 2022), <https://doi.org/10.1007/978-981-16-7326-9>.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> South Asia includes Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, Maldives, and India. While Southeast Asia or also known as ASEAN consist of ten Member States are Indonesia, Malaysia, Singapore, Vietnam, Cambodia, Myanmar, Lao PDR, Brunei Darussalam, The Philippines, and Thailand.

<sup>5</sup> Ida Bagus Rahmadi Supancana, *Pelembagaan Undang-Undang Keantariksaan Nasional (Institutionalizing National Space Act)* (Jakarta: Mitra Karya, 2006).

<sup>6</sup> Ibid.

<sup>7</sup> I.B.R Supancana, *Indonesian Space Policy, Regulations and Programs: Past Achievements and Future Prospects*, ed. Q. Verspieren, *ASEAN Space Programs*, (Singapore: Springer, 2022), <https://doi.org/10.1007/978-981-16-7326-9>.

<sup>8</sup> Ibid.

<sup>9</sup> Thomas Gangale, "Who Owns the Geostationary Orbit?," *Annals of Air and Space Law* 31 (2006): 425.

<sup>10</sup> Ram Jakhu, "The Legal Status of The Geostationary Orbit," *Annals of Air and Space Law* 7 (1982): 333–52.

<sup>11</sup> There is no equal definition of *dirgantara* in English words see T R Nugraha and P Amalia, "Militerisasi Ruang Angkasa, Quo Vadis Indonesia?," *Mimbar Hukum* 32, no. 3 (2019): 377–91, <https://journal.ugm.ac.id/jmh/article/view/52601>.

- <sup>12</sup> Ida Bagus Rahmadi Supancana, *Pelebagaan Undang-Undang Keantariksaan Nasional (Institutionalizing National Space Act)* (Jakarta: Mitra Karya, 2006).
- <sup>13</sup> Ridha Aditya Nugraha and Kartika Paramita, “Mempererat Regional ASEAN Melalui Tatanan Hukum Keantariksaan: Peluang Dan Tantangan Bagi Indonesia,” *Jurnal Hukum & Pembangunan* 49, no. 3 (2019): 636, <https://doi.org/10.21143/jhp.vol49.no3.2191>.
- <sup>14</sup> I.B.R Supancana, “How the Progressive Development of Outer Space Law Affects the Formulation of National Space Legislation: The Experience of Indonesia,” *Air Space Law* 40, no. 1 (2015): 93–106.
- <sup>15</sup> Ibid.
- <sup>16</sup> Ibid.
- <sup>17</sup> I.B.R Supancana, *Undang-Undang Keantariksaan Visi, Formulasi, Dan Tantangan Implementasi., Universitas Katolik Atma Jaya* (Jakarta: Penerbit Atma Jaya, 2019).
- <sup>18</sup> Supancana, *Pelebagaan Undang-Undang Keantariksaan Nasional (Institutionalizing National Space Act)*.
- <sup>19</sup> LAPAN, “Naskah Akademik Rancangan Undang-Undang Tentang Keantariksaan, Lembaga Penerbangan dan Antariksa Nasional” (Jakarta, 2012).
- <sup>20</sup> Supancana, “How the Progressive Development of Outer Space Law Affects the Formulation of National Space Legislation: The Experience of Indonesia.”
- <sup>21</sup> Ibid.
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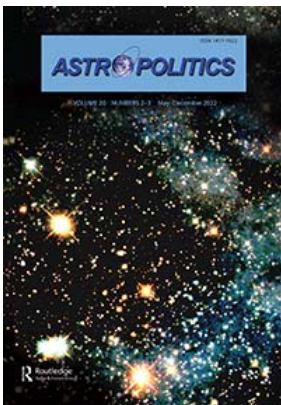
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