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REVIEW ARTICLE

A systematic review of the interrelation of administrative, Environmental, Social and Governance of Public-Private Partnerships (PPP) Spaceport Project in Biak, Papua, Indonesia

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ABSTRACT

This paper aims to explain the administrative and the Environmental, Social and Governance (ESG) of the Indonesian Spaceport Project in Biak, Papua, Indonesia, under the Public-Private Partnerships (PPP) scheme, particularly from the protest to fear of environmental damage and traditional rights. This paper analyzes the factors that cause the local society's reluctance to accept the development of Indonesia's very first commercial spaceport. This paper uses a doctrinal methodology, which examines changes in the trend of ESG in implementing PPP projects. The method used is a qualitative systematic review of national and international studies. This paper finds that the lack of legal certainty for administrative and ESG as the main factor contributing to the pitfall of the PPP project in Biak Papua. No clear Government Contracting Agency (GCA), plus the fact that the Indonesian government puts too much weight on business consideration in PPP while Papuan people need more ESG, especially considering the historical conflict in the region, has been the epicenter of the problem. Given the ESG-PPP regulatory failure of spaceport development in Biak, more focused studies using comparative study methodology are needed to propose a more robust and customized ESG in PPP regulations in a politically and historically sensitive area. The authors forward a regulatory reform to balance administration, ESG, and business considerations in PPP projects for a spaceport.

KEYWORDS

Biak; Environmental Social and Governance; Indonesia; Papua; Public-Private

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1. Introduction

In the early years of 2019, 2020, and 2021, the Indonesian government offered a small island in Papua called "Biak" to several countries and private companies, such as Elon Musk's SpaceX, to serve as a spaceport. The National Institute of Aeronautics and Space (LAPAN) met with the Space Technologies Corporation, SpaceX, to discuss the spaceport in Biak, Papua. The meeting occurred at the 35th Space Symposium in Colorado, United States, on April 8–11, 2019. Then, based on the release of the Coordinating Ministry for Maritime Affairs and Investment, the Indonesian government followed up and sent a team to discuss this more intensively.

Indonesia's geographical advantage is a selling point in becoming a launch site. This is because Indonesia is the best location for space launches in the equatorial region. The government will partner with a private consortium using the PPP scheme in this development. The spaceport at Biak will become a state facility for research and the satellite/rocket launch business. Regarding the spaceport development, LAPAN said the land had been 100 hectares in North Biak since the 1980s. The location is also considered ideal because it is closest to the equator and the east coast facing the Pacific Ocean. This advantage was confirmed by an economic analysis by Diana, which states that the spaceport location will have economic efficiency and contribution to local economic development (Diana et al., 2018). Moreover, there is also a potential for conducting innovative Air Launch Aerospace Projects from Biak, as Karpov highlighted (Karpov, 2010).

However, the plan was opposed by residents and several civil rights organizations. The construction of a spaceport is predicted to eliminate residents, narrow their living space, and damage the environment. This environmental problem accompanies the Spaceport project (Dachyar and Purnomo, 2018). The Biak people rely on their land for fishing, hunting, and farming and depend on the area's natural resources for their livelihood. The local people of Biak manage most of their land through customary tenure, making land acquisition complicated for outside initiatives such as a future spaceport. Residents say the displacement can lead to major conflicts between families and clans over land. Specifically, Perwitasari and Susanti identify the vulnerable group there: Papuan who live in Saukobye and Korem villages (Perwitasari and Susanti, 2019).

Papua's preparation to acknowledge changes through development can be measured by analyzing the growth in the human development index, the level of welfare, the potential for conflict, and cases of human rights infringement. The launch station utilizes local indigenous and sacred land (Santhika, 2018). Based on data from Forest Watch Indonesia, Papua loses 153,249 hectares of forest per year, or equivalent to twice the area of Jakarta. In specific for the construction of a spaceport, deforestation will certainly be carried out for land clearing, estimated to be 100 hectares or more. The high rate of deforestation is thought to be due to the large number of illegal activities that utilize Papua's natural forest resources.

Around 70% of LAPAN's total land area of 100 hectares is estimated to be used to develop launch facilities. The test launch of SpaceX's prototype rocket to Mars on August 27, 2019, Star Hopper, resulted in a 100-acre bushfire and blast caution within the launch area. This implies that other possible environmental impacts should be considered besides deforestation, such as air pollution or even marine pollution due to explosion debris. Illegal logging and deforestation have a big impact on climate change. Therefore, climate change mitigation, especially in small islands such

as Biak Numfor, must be carried out by increasing land use for forestry (Rachman, 2021).

Papua is still an issue from Indonesia's past (Rutherford, 1999). There are issues of occupation and human rights violations alleged to have involved the Indonesian government in the past. Not to mention that at this timin e, Indonesia is still facing the separatist movement of the Free Papua Organization (OPM) there. Before SpaceX, the public refused to cooperate with the Russian state space agency to build a rocket launch facility on Biak Island in 2002. Concerns about environmental and social impacts were also the driving force of protests in the previous period.

On the other hand, the Government of Indonesia for the Papua province considers that the spaceport development in Biak will become the Biak district as a hub and bring economic impacts to local governments and communities. Developing a spaceport in Biak will also put Indonesia in partnership with other Asia countries, namely India and China, which can launch satellites into orbit. It will be operational in 2024 and will be Indonesia's first spaceport. It is also set to be the only non-military spaceport in the Pacific near the equator.

The problems in Biak Papua reflect the weakness of institutions that can coordinate ESG issues and spaceport development. LAPAN is not an agency appointed as the executor of the project known as the Government Contracting Agency (GCA). Thus, there are structural problems and harmonization with other stakeholders to realize the PPP spaceport project truly. Further, LAPAN is currently included in Indonesia's Research and Innovation Agency, namely BRIN.

Indeed, for other PPP projects besides the spaceport, Indonesia already has a clear GCA institution. Institutions that play a direct role in the implementation of general PPPs, such as toll roads and airports, include the Ministry of National Development Planning of the Republic of Indonesia/National Development Planning Agency (PPN/BAPPENAS) as PPP coordinators, the Ministry of Finance in providing government support and government guarantees, and the Ministry/ Institution/Region as the person in charge of the cooperation project. In addition to speeding up the PPP stage, supporting institutions were also formed, such as the Policy Committee for the Acceleration of Infrastructure Provision (KKPPI), which was changed to the Committee for the Acceleration of Priority Infrastructure Provision (KPPIP), PT Sarana Multi Infrastruktur (SMI) which could act as a Preparation Agency in mentoring and/or financing to PJPK, and PT Penjaminan Infrastruktur Indonesia (PII) or Indonesia Infrastructure Guarantee Fund as an instrument for guaranteeing infrastructure development. Unfortunately, this is difficult to apply to a spaceport full of more complex technological, international political, environmental, and social interests.

The paper asks two central questions to try and understand if there are any flaws in regulations for PPP in Biak so that administrative, environmental, and social issues cannot be resolved from 2002 to 2022, two full decades:

- Learning from other state practices, what form of GCA is suitable for Indonesia's Spaceport PPP project?
- To what extend that the GCA should comply with the ESG to support the PPP Spaceport project in Indonesia?

We approach the issue through a qualitative systematic review of national and international studies.

This research is important because the increase in spaceport needs globally, including in Biak, shows the importance of strict rules regarding ESG to ensure that PPP projects are successfully executed. The spatial planning law, environmental protection, space law, and of course, the PPP regulations can be a tool to ensure the existence of ESG in the future. But if the law fails to give rise to the ESG, social reluctance will hamper development.

2. Methodology

An absence of matter needs the clarity seen from other practices. To identify the form of the GCA that is yet unknown, this paper seeks answers by conducting a comparative study method. This approach method aims to find answers fundamentally about causation by analyzing the factors that cause a legal phenomenon by comparing two or more of a particular variable (Nazir, 2005). A comparative approach is used by comparing the practices of a country that already has GCA to know the advantages of each so that it can be considered for implementation in Indonesia. The states that are being compared namely: the United States, Russia, European, and New Zealand. These countries were chosen as they are well established in commercialization spaceport practices. From these state practices, we can develop and identify a suitable form of GCA for the PPP spaceport in Indonesia. To meet the needs of comparative studies, this paper uses sources in the form of articles that discuss its practice. This paper also identifies number of regulations in Indonesia relating to the PPP, namely Law No. 21 of 2013 concerning Space, Presidential Regulations, ESG guidelines, and other related regulations.

2.1. The ESG guidelines for project financing

At the 2022 G20 activities, the Minister of Finance launched the ESG framework and guidelines for government support and facilities in project financing. ESG implementation is a concrete manifestation of following up on the Indonesia Presidency's G20 infrastructure agenda related to sustainable infrastructure and quality infrastructure investment. This initiative is the first ESG implementation policy set by the Ministry of Finance in project financing. ESG is a global standard practice that prioritizes aspects of sustainability, both in terms of being environmentally friendly, socially beneficial, and having outstanding governance (Administrator, 2022). ESG is a standard company applies in investment practices that integrate and implement company policies to align with environmental, social, and governance concepts (Sarnisa et al., 2022). There are three pillars in the ESG principles: 1) environmental risk analysis, 2) social risk analysis, 3) compliance and order. A good application of ESG principles will help stakeholders comply with applicable environmental regulations and standards, increase the positive impact of infrastructure development, open access to broader financing, and increase public acceptance of the project's development.

Indonesia as part of the world community has declared itself committed to and agreed on the sustainable development goals to end poverty, fight inequality, and mitigate the effects of climate change. This commitment is clearly stated in the Enhanced Nationally Determined Contribution (ENDC) by setting an unconditional emission reduction target of 31.89% (from the previous 29%), and a conditional reduction target of 43.2% (from the previous 41%) in 2030 (Ministry of Finance, 2022). At the national level, the implementation of this commitment is translated into number of policies. In the context of development planning, the 2020–2040 National Medium-Term Development Plan has placed the sustainable development goals as part of the objectives

to be achieved. This is in line with the mandate in Presidential Regulation Number 111 of 2022 concerning the Implementation of Achieving Sustainable Development Goals.

From an environmental and social perspective, the demand for ESG stems from the requirement to anticipate and avoid or minimize and offset residual impacts on the environment and nearby communities, including indirect, induced, and cumulative impacts. By adhering to the necessary ESG regulations, ESGs can also safeguard cultural assets and prevent harmful effects on indigenous peoples. ESG can also minimize land acquisition and forced resettlement so as not to harm the communities (Ministry of Finance, 2022).

The Minister of Finance of the Republic of Indonesia, Sri Mulyani Indrawati, mentioned that this ESG policy will provide clear guidelines for all infrastructure project stakeholders, especially regarding roles and actions that need to be taken to ensure that the infrastructure projects meet the ESG aspects. When the government builds an infrastructure project, the project must not be detrimental to society and the environment. Infrastructure should not worsen the environment either in the form of this ESG Policy, which reflects the importance of sustainable, resilient, inclusive and transparent development in Indonesia, especially in infrastructure financing. This ESG policy needs to be seen as an opportunity to increase the benefits of infrastructure development and open wider access to private financing. This effort is the Ministry of Finance's commitment to continue paying attention to environmental, social, and governance aspects in PPP (Ministry of Finance, 2022). However, this ESG implementation is an implementation that will be carried out in stages starting in 2022. Until now, only three projects have been carried out with the PPP scheme by applying ESG principles, namely the Jambi Merangin Dam and public housing in Cisaranten and Karawang, Jawa Barat (Administrator, 2022).

2.2. PPP of Spaceport Project

2.2.2. Theories of PPP

In the context of infrastructure and other services, the PPP program represents a variety of potential relationships between the public and private sectors (Habsi and Ullah, 2022). PPP has a good history in developed countries such as the US and the EU, but still in its infancy in certain other nations. To create and maintain infrastructure for various economic activities, cooperation between the public and private sectors has significantly increased in recent years. Such PPP arrangements were motivated by both initiatives to improve the quality and efficiency of public services as well as restriction on public funds to cover investments needs (Crauser, 2003). The construction, financing, and delivery of public infrastructure and services have increasingly been entrusted to the private sector by governments in Europe and other parts of the world (Roehrich et al., 2014). Their advocates argue that encouraging greater provision diversity and contestability, such "partner-ships" secure better-quality infrastructure and services at "optimal" cost and risk allocation (Kwak et al., 2009). Although conceptually a public-private partnership (PPP) can be defined relatively simply, as "a long-term contract between a private party and a government agency, for providing a public asset or service, in which the private party bears significant risk and management responsibility" (World Bank Institute and PPIAF, 2012), there are several ideas regarding the definition of PPP.

According to Maskin and Tirole, there is no universal definition of PPP (Nsasira et al., 2013). No single definition is satisfactory in limiting the definition of PPP because the scope of PPP is

very broad. However, there are at least several definitions that can be used as a reference for the definition of PPP, namely: first, Liu and Yamamoto (2009) stated that the PPP model is a form of collaboration between the public (government) and private sectors to provide public services that are traditionally provided by the public sectors. Second, according to Koschatzky (2017), PPP is a public service activity and/or a private economic activity with joint financing and operations by the public sector and industry based on a contract that regulates the financing and operations. Third, Akhmetshina et al. (2017) mentioned that PPP is an institution and an organizational alliance of government authorities and private businesses that aims to realize socially important projects, with a range of activities starting from the development of strategically important for the economic sectors to the provision of public services throughout the country or region (Maramis, 2018).

From a theoretical perspective, PPPs have been recognized as collaboration distinct from more traditional alliances, joint ventures, and other interorganizational linkages in purely private settings (Quelin, Cabral, et al., 2019). PPP has more powerful incentives than public bureaucracy but also more administrative controls and probity problems than private governance because they exist between the polar types of public and private bureaus (Williamson, 1999). Additionally, and perhaps most importantly, it has been demonstrated that non-market objectives and political influence play a particularly prominent role in these contexts (Bonardi et al., 2005). Existing studies imply that public-private collaboration improves the role of markets relative to that of governments, perhaps leading to stronger innovative ability and more efficient working methods, yet such outcomes have not yet been sufficiently, theoretically and empirically explored (Hodge and Greve, 2007; Kivleniece and Quelin, 2012; Quelin, Kivleniece, and Lazzarini, 2017). Since PPP is not a novel kind of collaboration, Indonesia has been developing PPP since the New Order era (Talomau, 2017).

Development is the focus of the Government of Indonesia. With infrastructure development, it is believed that it can increase the country's economic growth (Prita and Budhijanto, 2018). Public cooperation with the private sector has been known in Indonesia for a long time in several areas, such as in the construction of toll roads, electricity, and airport infrastructures. But in the space industry, the PPP mechanism is rarely implemented in Indonesia even though the PPP scheme is needed in the construction of space airports. The limitations of the National Budget in financing infrastructure development led to funding problems; the limitation can be solved by involving private companies to become alternative sources of funding and financing. Using PPP, the government can determine the specifications and risk sharing before the partnership is carried out with the resources from private entities. This is part of the PPP project cycle consisting of four stages: planning, project preparation, transactions, and contract management. As a legal basis for PPP, Indonesia has enacted Presidential Regulation No. 38 of 2015 concerning Public Private Partnerships in Infrastructure Development. Other major regulations relating to the PPP in infrastructure development are shown in the table.

The Indonesian National Development Planning Agency (Bappenas) publishes the Indonesian PPP Book every year to show the list of projects open for public private partnership (Bappenas, 2017, 2018, 2019), yet in 2017, 2018, and 2019 editions, no spaceport project was enlisted. So far, the space-related industry offered is a multifunctional satellite development project, which is also a good sign that Indonesia is willing to start to the space commercialization phase. Presidential Regulation No. 38/2015 allows two types of infrastructure potential for PPP: economic and social infrastructure. The latter includes, among others: transportation infrastructure, telecommunications

No	Name	Description	Year
1	Presidential Regulation No. 38 of 2015	PPP in Infrastructure Development	2015
2	Presidential Regulation No. 56 of 2018	Presidential Regulation No. 56 of 2018 (Second Amendment to Presidential Regulation No. 3 of 2016 concerning National Strategic Project)	2018
3	Minister of Finance Regulation No. 8 of 2016	Amendment to the Regulation of the Minister of Finance Number 260/PMK. 011/2010 concerning Instructions for Implementing Infrastructure Guarantees in Public Private Partnership	2016
4	Regulation of the Minister of National Development Planning No. 2 of 2020	Regulation of the Minister of National Development Planning No. 2 of 2020 concerning amendments to the Regulation of VAT No. 4 of 2015 concerning procedures for implementing Public Private Partnership in provision of infrastructure	2020
5	Regulation of the Head of the Government Goods/Services Procurement Policy Agency 19 of 2015	Regulation of the Head of the Government's Goods/Services Procurement Policy Agency 29 of 2018 concerning procedures for procuring Private entities in Public Private Partnership in provision of infrastructure	2015
6	Presidential Regulation No. 49 of 2021	Presidential Regulation No. 49 of 2021 concerning the amendment of Presidential Regulation No. 10 of 2021 concerning Investment Business Activity	2016
7	Minister of Finance Regulation No. 190 of 2015	Availability Payment	2015
8	Presidential Regulation of the Republic of Indonesia No. 78 of 2010	Infrastructure Guarantee in PPP Projects Conducted through Infrastructure Guarantee Agency	2010
9	Regulation of the Head of Government Goods/Services Procurement Policy Agency 29 of 2018	Procedures for Procurement of Private Entities Implementing Infrastructure Provision through Public Private Partnership on the Initiative of the Minister/Head of Institution/Head of Regions	2018
10	Presidential Regulations 58/2017	Acceleration of Implementation of National Strategic Projects	2017
11	Minister of Finance Regulation No. 129 of 2016	Government Facility in the context of preparing and implementing transactions of Public Private Partnership in the Provision of Infrastructure	2016
12	Minister of Finance Regulation No. 170 of 2015	Provision of Viability Gap Funds	2015

and information technology infrastructure, and education infrastructure. The space industry can be included in this category, especially spaceports as commercial facilities.

Data from the Indonesian Ministry of Finance shows that the ability of the Indonesian government to finance infrastructure development State Revenue and Expenditure Budget and/or Regional Revenue and Expenditure Budget is very limited (Putria and Wisuanto, 2016). According to the Appendix to Presidential Regulation No. 18 of 2020 concerning the National Medium-Term Development Plan (RPJMN) for 2020–2024 (n.d.), to achieve the growth target in the 2020–2024 RPJMN, the need for infrastructure spending reaches Rp. 6,445 trillion, while the government's ability to finance is only Rp. 2,385 trillion (only 37% of total needs). For this reason, innovative efforts are needed to encourage the participation of private entities whose fulfillment can be achieved through alternative funding, such as Public-Private Partnerships and other alternative funding sources in the form of funds from banks and capital markets. The minister who carries out government affairs in finance and state assets can approve financial support and/or tax incentives following statutory regulations. The government can also provide Government Guarantees for PPP by considering the principles of financial risk management and control in the state budget. The minister in charge of state finances and assets carries out risk control and management of Government Guarantees.

2.2.2 Business background of a space project

The space industry is currently undergoing rapid transformation, so it makes sense that research and innovation collaborations between the public and private sectors are common. Private companies play a significant part in bringing spaceport projects to reality nowadays. Building a spaceport, crucial for advancing space exploration, eradicates the growing gap between the current stage and the aspiration of establishing a more advanced space civilization (Garry et al., 2020). Building spaceports also help private space companies thrive and be productive. Planners should be mindful of configuring each PPP to meet the demands, capabilities, resources, and objectives of the parties involved when considering applicability to the space.

In the U.S., the need for private investment was underlined by both the Obama and Trump administrations when figuring out how to offer a public or collective good such as critical infrastructure. This focus extends to space as the National Space Policy of 2010 and the National Aeronautics and Space Act of 1958 (as amended) both encourage the use of PPP to accomplish the goals of the U.S. government to create a solid and competitive commercial space sector (Obama, 2010).

Public infrastructure projects such as toll highways, wastewater treatment, and public buildings are typically associated with PPP. Innovative partnerships, utilizing the strengths of both public and private organizations, address a wide range of industries far beyond transportation, including space. This variety explains why there isn't a single, generally acknowledged PPP success formula.

Traditional public infrastructure projects are designed to provide functional support using a variety of PPP project delivery approaches, including concession agreements and operation and maintenance. Contrarily, PPP delivery models for the space industry are frequently accompanied by various agreements for risk and expertise sharing through collaborative research, Space Act Agreements (SAAs), and longer-term development partnerships. Utilizing the innovation and agility

of the business sector appears to be the current focus. The space industry is committed to partnering with the private sector to share innovation and risk. Between the public and private sectors, there is a fluctuating range of risk and engagement (Jones, 2018).

The experience of Russia's space sector with PPP offers an intriguing contrast. Russia's efforts are sporadic compared to the U.S., which has made great strides in "privatizing" the space sector and creating successful public-private partnerships such as NASA's commercial orbital transportation services programs. After the Soviet Union fell apart in 1991, the Russian aerospace industry underwent partial privatization and made progress through public-private partnerships (Jones, 2018).

In Indonesia, the spaceport is the entrance to open opportunities to conduct space research, remote sensing, space technology mastery, launch, and commercial space activities, as highlighted in Article 7, Law No. 21 of 2013. Without a spaceport, space activities are challenging to develop. Related to the mandate of Article 11 of Indonesian Space Act, the spaceport has to be the center of Space Science which encourages research on space weather, the space environment, and astrophysics. The facilities supporting these activities should be standard airport facilities, including satellites, space stations, and earth segment observation facilities. Spaceports can also be the center of mastery and development of space technology, including, but not limited to, the mastery and development of rocket technology, mastery and development of satellite technology, mastery and development of aeronautical technology, and technological propagation.

In connection with the space business relationship, it is not instantly beneficial because of the intensity of launch activities. Still, continuously it will begin as a mobilization that will affect infrastructure development which can improve the community's economy. Possibly in the future, the government can cooperate with start-ups since it will be the driving force for the industry. Indonesia's other interest is to fight for prestige. On the off chance that effective with this project is, in the future, Indonesia will be more viewed/have a position in the eyes of other countries, and Indonesia's foreign policy relations will be much more robust and, most importantly, will give its national pride (Wardana and Putrianti, 2021).

The legal basis for developing space airports with the PPP scheme contained in Article 26 paragraph (1) of the Space Act stipulated that the development and construction of facilities and infrastructure for the mastery and development of space technology activities open for national or foreign companies. In implementing the acquisition and development of Lantern technology, as mentioned above, national companies may include foreign entities as subcontractors/PPP has received much attention, including in national policies, as a potential solution to the challenges of developing the space industry that is known for having high costs, high risks, and long periods of the break-even point. But PPP is not a tool that can eliminate this challenge. Instead, PPP provides a way to manage the challenges better so that they get the best quality. Successful results depend on implementing PPP effectively and consistently.

3. Government contracting agencies in other countries

Nowadays, a body of different national policies and legal mechanisms exist governing spaceports. Seedhouse sees that the United States has the most advanced regulations on spaceports (Seedhouse,

2017). Ardes elaborates more on a detailed comparative study of PPPs between countries (Ardes, 2020). In the United States, government or private entities can own and operate spaceports. The spaceports owned and operated by the US federal government are called federal ranges.

The state of Florida established a "Space Florida" agency to attract and retain aerospace partners from the private sector to boost the economy in the state of Florida by developing and operating infrastructure facilities targeted at upgrading the state's existing spaceport at Cape Canaveral. Initially, the construction of the Cape Canaveral Spaceport was carried out at the expense of the United States Federal Government. The National Aeronautics and Space Administration (NASA) and the United States Air Force (USAF) will focus on regional developments. However, due to the development of commercial markets and federal budgetary constraints, the independent agency Space Florida was created in 2006. The powers and responsibilities of Space Florida are described in Chapter 331, Part II of the Florida Statutes. Since then, Space Florida has been the sole agency authorized to manage and develop Cape Canaveral Spaceport, including its financing. After Space Florida was formed, funding sources to develop and construct a new facility at Cape Canaveral Spaceport no longer depended on the federal budget. As a land manager and regulator, Space Florida has a funding scheme for constructing and developing facilities at Cape Canaveral Spaceport. This funding scheme allows NASA and the USAF to focus on developing facilities and other government-related missions. However, NASA and the USAF retain ownership of the property in Cape Canaveral Spaceport. Only they can lease the land or grant it through a contract. Funding comes from the private sector, commercial industry, and the Florida state government (Ardes et al., 2020).

To launch the activities of Space Florida as an entity specifically established to operate the Cape Canaveral Spaceport, the Florida state government deems it necessary to bind the parties' commitments into a separate statute. The statute implies a division of the burden of financing the facilities the Federal Government and Space Florida bear.

In EU practice, there is the construction of the Soyuz project. The parties involved in the Soyuz project are: (i) ESA is responsible for the overall program, (ii) ROSCOSMOS is responsible for activities in the Russian Federation, (iii) CNES is the main contractor and System Architect, which is responsible for development programs and is responsible for European and Russian activities, (iv) CNES CSG is responsible for launch range and flight safety, (v) Arianespace is responsible for Russian activities, (vi) TsSKB-Progress is the general designer of the Soyuz ST launcher, (vii) KBOM is responsible for all launch zone ground equipment, and (viii) NPO-Lavotchkine is the top-level, general designer of the Frigate. General coordination of the Guiana Space Center is carried out by CNES, ESA, and the company Arianespace, which acts as the launch operator. These three entities are the main players in the entire operation of the Guiana Space Center (Ardes et al., 2020).

CNES became a significant player in the European space effort tasked with outlining, proposing, and implementing space policy. For more than 40 years, CNES has been responsible for the project management of the Ariane program in collaboration with European researchers and industry (Ardes et al., 2020).

ESA owns the Ariane 5, Vega, and Soyuz launcher infrastructure. This includes the launch and satellite preparation building, launch operations facility, and launcher production facility for the Ariane 5 solid propellant booster, mainly manufactured and integrated at the spaceport (Ardes et al.,

2020).

Arianespace was founded in 1980 as the world's first launch services and solutions company. Currently, Arianespace has 21 shareholders from ten European countries. Since its inception, Arianespace has signed over 350 launch contracts and launched 311 satellites. Arianespace launches more than two-thirds of the commercial satellites now operating worldwide. Arianespace is responsible for placing the payloads of its subscriber satellites into orbit and marketing launch services, acquiring launch vehicles, preparing missions, and handling all customer relationships, with the dual aim of becoming a leader in commercial space transportation and ensuring Europe's independent access to space. At the spaceport in French Guiana, Arianespace manages an industrial team that integrates and prepares for launch and oversees the satellite campaign since the spacecraft's arrival via injection into orbit (Ardes et al., 2020).

From a regulatory perspective, the New Zealand Space Act and the Outer Space and High-altitude Activities Act 2017 ("OSHAA") do not contain provisions regarding financing the development of a spaceport. Regulations regarding spaceports are contained in subsection five on facility licenses. Unlike Law Number 21 of 2013 concerning space, OSHAA does not indicate the nationality of any spaceport operator but only states that individuals or groups of people can apply for a facility license to the minister. In contrast to other countries, the role of the New Zealand Government in construction and operation can be said to be relatively minimal. This is because the majority of financing comes from private investors. The New Zealand Government has the authority to ensure that activities at launch complexes do not conflict with national and international obligations or jeopardize national interests. This authority manifests in the right to stop all launch activities at the complex. Rocket Lab and its investors are the rest of the leading players in financing this launch complex's construction. Thus, the focus of this financing scheme is not a public-private partnership but a foreign investment (Ardes et al., 2020).

In the practice of developing a country's spaceport, there are several parties involved in financing. At least three main parties are involved: the government, the operator (the entity appointed as the main person in charge of activities at the spaceport later), and investors (Ardes et al., 2020).

In the PPP system, the government will play a direct role. It can even be in charge of the cooperation project. On the other hand, if Indonesia chooses a scenario for forming a new entity, the government's role and control will remain essential in practice. For example, Space Florida was founded as the lead operator at the Cape Canaveral Spaceport. However, Chapter 331 Section 2, subsection 331,308 of the Florida Statutes indicates that the members of the board of directors of Space Florida shall consist of (i) the Governor of Florida or his delegates, serving as the chairman of the board of directors; (ii) the Secretary of the Ministry of Transport or his representative; (iii) the Florida Workforce President or his representative; (iv) the Florida Enterprise President or his representative; (iv) the education commissioner or his representative; (v) 12 members from the private sector appointed by the Governor; and (vi) two (2) ex-officio members who do not have voting rights. These directors hold supreme power in Space Florida and are authorized to make decisions. From this composition, it can be seen that the government element retains the primary control of the independent company. Thus, it can be concluded that cooperation does not necessarily negate the role of the government (Ardes et al., 2020).

The spaceport planned by LAPAN will be carried out in two (2) stages, a small and large-scale

spaceport. The small-scale spaceport is targeted for completion in 2024. The small-scale spaceport will be able to reach an orbit of at least 300 kilometers. Regarding the plan, LAPAN has not been able to determine the number of funds that must be allocated to build the spaceport complex in Biak. But for comparison, in 2015, NASA built a small rocket launch pad at the Kennedy Space Center with a budget of US $ 900,000. The funding provided by NASA is only an additional facility from all the facilities at the Kennedy Space Center that are already operational (Thressia, 2021).

It is impossible to finance a spaceport's development by relying on the State Budget (APBN) allocated for LAPAN. In 2018, LAPAN received a budget of Rp. 852,637,368,000, of which 86.88% of the budget or Rp. 740,758,703,000 was allocated to carry out technology and space development programs (Thressia, 2021). Without a significant increase in the budget, the spaceport construction can't be charged to the LAPAN budget. Financing options for developing a spaceport can be explored by opening up the participation of foreign business entities and partners through a cooperation scheme. So far, LAPAN has explored cooperation with several countries, such as China, Japan, Korea, India, and Russia.

4. Possible Government Contracting Agency in Indonesia for the PPP spaceport project

Currently, Indonesia does not have clear rules regarding which institution is the Government Contracting Agency (GCA) for the Spaceport Project in Biak. This is a very big obstacle to implementing the PPP spaceport project. The uncertainty of which institution the GCA cannot be separated from the absence of an authority that strongly regulates the commercialization aspect of space. Even in 2021, the Indonesian Space Agency, LAPAN, was merged into the Indonesian Research Agency BRIN. With the condition of being merged to a research agency that has a focus only on research and development, not as an institution responsible for providing infrastructure, it adds a strong reason that LAPAN is not enough as a GCA for the PPP spaceport project. Other than the research agency, there are also other agencies that have the potential to become GCA for spaceport projects in Indonesia. The complexity of affairs regarding the spaceport can be seen from the authority of other ministries in Indonesia, for example, the Ministry of Transportation—because the spaceport is a transportation infrastructure, the coordinating Ministry of Maritime and Investment—because the development of the spaceport involves very large investments from abroad, up to the coordinating ministries, politics, law, and national security—because spaceport affairs involve strategic technology, politics, and security. This illustrates the ambiguity and chaos of GCA for spaceport projects in Indonesia.

The GCA itself is very crucial for PPP because it is the GCA that makes PPP contracts with foreign investors and is tasked with being the cornerstone in the commitment and implementation of the PPP. GCA has a vital role in terms of return on investment which can be in the form of tariffs and payments for service availability (Anggraeni and Sari, 2020). In the implementation of PPP, GCA needs to carry out various stages of the PPP scheme starting from the planning, project preparation, transactions, and contract management. Without a clear GCA administration, PPP projects cannot be executed in the early stages and become a major administrative obstacle. All ministries and institutions with the authority and interest to build a spaceport will try to open uncoordinated cooperation and ultimately become an obstacle. From an investor's point of view,

the ambiguity of the GCA is the biggest weakness that makes investors hesitant to establish PPP cooperation to build a spaceport in Indonesia.

The review shows that in terms of organizational structures, LAPAN is given the most essential authority to design and initiate spaceport development. However, no strict rules explicitly designate LAPAN as a GCA. Thressia shows that in the Indonesian Space Act, spaceports are one of the issues included in the scope of regulation in the Indonesian Space Act, where the regulation on spaceports is made in a separate chapter in the Indonesian Space Act. This arrangement is contained in Chapter V of the Indonesian Space Act, consisting of five (5) articles (Thressia, 2021). The Indonesian Space Act mandates that LAPAN will determine the location, construction, and operation of the spaceport as an institution that carries out government affairs related to implementing outer space.

The mandate regarding the establishment, development, and operation of a spaceport by the Indonesian Space Act is translated into the Master Plan for the Implementation of Space Administration, which is stipulated by Presidential Regulation Number 45 of 2017 concerning the Master Plan for the Implementation of Space Activities in the five-year target in the Master Plan for the Implementation of Space Airport, the construction and operation of a spaceport are targeted to be implemented in the Medium Term I (2021 to 2025).

Margaleta, states that LAPAN, as the focal point for implementing national space, is an Auxiliary State Organ, namely an Additional State Institution whose duties and authorities are included in the category of mandate authority (mandaat bevoegdheid) (Leta et al., 2016). The mandate authority in the Space Law is in the form of regulation and control. According to Self, the context of the mandate authority shows that the LAPAN organization's political value is not dominant but is more focused on controlling the implementation of technical space operations (Self, 1972). LAPAN's institutional position becomes a reference in determining the institutional form of various technical activities supporting the implementation of LAPAN's main competencies, including launching activities at KSN Bandar Antariksa (Fatmawati, 2018). LAPAN can indeed be a promising GCA, but again, LAPAN is currently only a research institute under BRIN. As a research institution, LAPAN has limited authority and does not cover complex GCA tasks such as the various stages of the PPP scheme starting from planning, project preparation, transactions, and contract management.

Rachman, reminded us that from another perspective, regional autonomy in Indonesia also gives authority to local governments where spaceports are located (Rahman, 2021). The construction of the SpaceX spaceport in Biak Papua will at least threaten the existence of the forest and customary land of the Biak customary law community, as currently disputed with the government. Deforestation will undoubtedly be carried out for land clearing, estimated to be 100 hectares or more. Meanwhile, development carried out with economic incentives will impact the emergence of potential conflicts because of the requirements for interests.

In the economic aspect, the superior commodities in the Saereri region, which include the regencies of Biak Numfor, Supiori, Yapen, and Waropen Islands, include the use of forest products in the form of wood and food (sago), wood processing industries, and the development of integration of fisheries and agricultural fields. However, abundant natural resources do not increase the community's welfare. The lag behind Biak Numfor is due to the low level of the economy, hard-to-reach access, and low regional financial capacity (Wijayanto, 2016).

The development of a spaceport must be based on the mandate of Law No. 21 of 2013 concerning space. Article 44, paragraph (3) of this law states that the location of the spaceport must be designated as a national strategic area. Based on the National Spatial Plan data based on Government Regulation No. 26 of 2008 in conjunction with Government Regulation No. 13 of 2017, the spatial direction of the Papua Province national scope, Biak Numfor, is included in 25 national strategic areas from the point of view of environmental interests. Meanwhile, Biak is included explicitly in the national strategic area from the point of view of economic importance. It is also one of the mainstay areas for the tourism, fisheries, plantation, industry, mining, and forestry sectors based on the National Spatial Planning (RTRWN), Spatial Planning (RTR), Islands and Spatial Planning (RTR) for National Strategic Areas (KSN).

The development of a spaceport is not included in the national strategic project, as stated in Presidential Regulation No. 3 of 2016 with Presidential Regulation No. 56 of 2018 in conjunction with Presidential Regulation No. 109 of 2020. This means that the development of a spaceport is a strategic project within a non-ministerial institution, in this case, LAPAN.

Logically, production forests located on LAPAN land can be converted because if the land where the forest is located is certified as property rights, then the production forest is considered a community forest in the sense that a certain institution, namely LAPAN, owns it. However, the conversion of forest areas is still within the scope of forestry. At the same time, the change of designation allows forest areas to be turned into non-forest areas, and conversion provides an opportunity to eliminate the forestry functions. Meanwhile, the release of forest areas is under the minister's authority.

Local governments, both provincial and district/municipal, are expected to contribute significantly to efforts to reduce carbon emissions and deforestation. Illegal logging and deforestation have a significant impact on climate change. Globally, indigenous and tribal peoples are the most vulnerable to climate change impacts. Therefore, climate change mitigation, especially in small islands such as Biak Numfor, must be carried out, one of which is by increasing the use of land for forestry. Land clearing in forest areas for non-forestry activities must obtain a permit from the Minister of Forestry based on the approval of the Governor.

The existence of great authority between LAPAN and the interests of the area where the spaceport is made makes the need to form a special GCA that comprehensively coordinates all interests. This opinion is a balanced approach (Fatmawati, 2021). According to Moore (Anggara, 2014), in general, actors involved in the formulation of public policies are state actors, private actors, and civil society actors, while Kusumanegara states that in the study of the policy process, policy actors come from various institutions that are included in the political superstructure and infrastructure (Kusumanegara, 2010). Experts identify actors with various names, such as legislators, executives, judiciary institutions, pressure groups, political parties, mass media, community organizations, administrative or bureaucratic apparatus, Non-Governmental Organization (NGO) groups, private groups, think tank groups, and shadow cabinets. Each actor has characteristics that show their strength in influencing the policy process.

Stakeholder grouping in the study includes:

- Government: (central/regional) international authority

- Community/public organization: environmental organization, community
- Large companies: cargo providers, orbital facility providers, orbital facility managers, transportation system providers, transportation system business owners
- Investors: insurance, private investors, venture capital
- Scientists/academics: government laboratory managers, university researchers, space education activists
- Space star-up: public service providers, suppliers, managers of the space tourism business

GCA must consist of LAPAN as the leading central authority in space affairs and the local government where the spaceport is built. In addition, to ensure the representation and feasibility of the PPP to be built, LAPAN and the local government must also involve the community, a consortium of companies, local Indonesian investors, academia, and the space start-up industry.

5. ESG adequacy in Indonesian regulations for Spaceport PPP

Chronologically, PPP has been started long before now. The partnership between the government and the private sector has been known since the New Order era, such as on toll roads and electricity (Irwanugroho, 2019). Initially, the government consistently made efforts to realize infrastructure by allocating a budget for infrastructure development. During the New Order era, the infrastructure sector was the largest post in the APBN, focusing on road construction, which increased by 74% (1979), and irrigation networks by 14.9% (1985).

The two focuses of infrastructure development at that time aimed to support the government's distribution efforts in agricultural investment and self-sufficiency in rice. Entering the period of monetary crisis and Indonesian reforms, infrastructure development was stopped when Indonesia experienced the monetary crisis in 1998. This crisis caused the government to lose the ability to finance infrastructure development and further infrastructure maintenance and rehabilitation funding.

Realizing that infrastructure could be left behind in other countries due to the crisis, the government aggressively issued various policies supporting accelerating infrastructure development. In practice, infrastructure development did not run smoothly considering the fiscal limitations of the existing APBN, until finally, it required the government to find other alternatives with creative financing schemes, one of which was encouraging the active role of the private sector through the PPP scheme (at that time known as Kerjasama Pemerintah Swasta or KPS). PPP focuses on economic and social infrastructure by changing the mindset of infrastructure development from providing physical buildings to providing services for the community.

After the monetary crisis, government cooperation began to be developed, known as Public Private Partnership (PPP), and issued Presidential Decree No. 7 of 1998 concerning Cooperation between the Government and Private Business Entities in the Development and/or Management of Infrastructure.

In 2005, the Indonesian government began to urge the implementation of the PPP concept. This

is confirmed by Presidential Regulation No. 67 of 2005 concerning Government Cooperation with Private Entities in the Provision of Infrastructure, revoked Presidential Decree No. 7/1998. It began with implementing the Indonesia Infrastructure Summit I in mid-January 2005. At that time, the government offered 91 projects to investors to become PPP projects. However, in reality, in the implementation of the PPP, there are still many obstacles; one example is land acquisition (Abbas, 2018).

Minister of Finance Regulation No. 38 of 2006 describes the conditions and processes for seeking government support, including guarantees. Based on this Minister of Finance Regulation, the government can provide guarantees against three types of risks: political risk, project performance risk, and demand risk.

Regulation of the Coordinating Minister for Economic Affairs No. 4 of 2006 requires that a request for contingent support must at least be included in the feasibility study section. This is more strictly regulated than the initial feasibility study arrangement in Minister of Finance Regulation No. 38 of 2006. Both regulations stipulate that other documents must be submitted for support, including the cooperation format, budget plan, results of public consultations, and others. The government has established PT. Indonesia Infrastructure Guarantee Fund (PT. PII) to manage these guarantees. In 2015, to adapt to the world's latest PPPs, the Government issued Presidential Regulation No. 38 of 2015. Since this Presidential Regulation was launched, the collaboration, previously known as Public Private Partnership (KPS), is now referred to as PPP.

Additionally, in ensuring infrastructure provision and positive socio-economic, environmental, and governance impacts, project financing must be supported by adopting ESG (Bidara and Muhammad, 2022). Applying the ESG-based framework in infrastructure projects will improve people's welfare and save on using APBN. ESG contributes positively to the economy and minimizes the potential negative impacts of infrastructure provision on the environment and society (Ministry of Finance, 2022). The implementation of this policy is one of Indonesia's efforts to commit to maintaining the economic welfare of the people, protecting the social life of the people, maintaining the quality of the environment and inclusive development, and implementation of governance that can maintain the improvement of life from one generation to the next (Article 2 of Presidential Regulation Number 111 of 2022). This is in line with the mandate in Presidential Regulation Number 111 of 2022 concerning the Implementation of Achieving Sustainable Development Goals. Therefore, the government, including the Ministry of Finance, through a particular mission vehicle, PT Indonesia Infrastructure Finance (IIF) will apply the ESG principle in financing infrastructure (Adminiif, 2022).

The regulations regarding PPP are indeed very numerous and technical. This is different from the rules used by Indonesia regarding space:

- Article 5 paragraph (1), Article 20, and Article 31 paragraph (5) of the 1945 Constitution
- Law of the Republic of Indonesia Number 16 of 2002 concerning Ratification of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 1967 Exploration, and Use of Space, Including the Moon and Other Celestial Bodies, 1967
- Law Number 21 of 2013 concerning space.

Indeed, the regulations are quite complex. Thus, Indonesia has to maintain the principle of governance, which requires a check and balances mechanism in implementing the PPP to avoid conflicts of interest (Jones, 2018). The need to have new space law regulations, according to Tronchetti (Tronchetti, 2013), is driven by four main factors, namely: (1) the technological developments, (2) the increased capabilities of specifically launching satellites into orbit, (3) the rise of new commercial space activities, and (4) the emergence of new legal and technical issues that were not foreseen or considered relevant at the time of the drafting of the UN space treaties (Avgerinopoulou and Stolis, 2017).

6. Discussion and conclusion

Until now, Indonesian regulations do not explicitly regulate the existence of a GCA for spaceport projects. This is the first obstacle to successfully executing spaceport projects in Biak Papua and possibly other areas in Indonesia. The current condition shows the chaos of overlapping authorities between various agencies in Indonesia. LAPAN, as the foremost institution that allows and has been given the mandate to develop a spaceport, has its authority circumcised and parked as a research institution only; of course, this is not in line with the direction of commercialization of space through spaceports in Indonesia. The author believes LAPAN may be an institution with enormous potential to become a GCA. The reason is that in order to become a GCA, a state institution must have a central position in the PPP sector it is involved in. However, GCA also has a responsible for providing infrastructure, which is beyond the responsibility of LAPAN as a research agency. LAPAN needs this confirmation to unleash its potential to coordinate various PPP complex issues and facilitate the authority of the local government where the spaceport is built. With this clarity, Indonesia can enter the next stage of securing commitments with investors.

The United States' practice of granting authority to NASA and establishing a special authority to manage spaceports can be used as a benchmark. In this model, LAPAN must be equated with NASA. LAPAN can cooperate with military authorities to safeguard aspects of national defense from spaceport activities that tend to be technology sensitive. Then to involve the local government, the central authority must form an institution that handles explicitly the problem of the spaceport to be built. However, even so, the ownership of the spaceport and the primary manager must be in the hands of LAPAN and the Indonesian military.

ESG can only be implemented if institutional administration problems have been resolved. GCA has an essential role as an infrastructure provider. GCA is the party that prepares and is responsible for the PPP project. Everything that happens in the PPP process, including social, and environmental issues and governance of the development and the operation of the spaceport, is the responsibility of GCA as the project owner for the sustainability of the development.

Based on the ESG guidelines, GCA needs to understand the ESG risks relating to the infrastructure in the relevant sector at an early stage in project design; to better understand the various socio-economic benefits of planned infrastructure projects so that they are better prepared to gain support from the stakeholders; to understand the gaps in ESG capacity and understand the need for support from the Ministry of Finance and Project Development Facility implementers; to understand their responsibilities relating to ESG risk management and report performance; to provide a comprehensive ESG risk and benefit assessment and prepare for mitigation during the

preparatory phase; to prepare required documentation such as Environmental Impact Assessment (AMDAL) or Environmental and Social Impact Assessment (ESIA), as well as additional studies related to environmental aspects (Ministry of Finance, 2022).

In the PPP scheme, ESG is implemented in the first stage, namely project planning, a preliminary study that includes an assessment of material environmental, social and governance risks, public consultation and stakeholder engagement in PPP projects. In the second stage, the project preparation stage, the agreement to provide government support must include an ESG data sheet outlining the project's high-level ESG risks; the pre-feasibility study must cover the overall socio-economic benefits; and the AMDAL document should cover a wide range of risk categories. In the third stage, the transaction stage, tender documents and agreements must include ESG safeguards and commitment to manage ESG during project implementation. In the last stage, the implementation stage, the monitoring report should include the status of the project's ESG impact, a regularly updated list of ESG risks, and the status of existing ESG management activities, proactive ESG risk management and achieving higher ESG performance (Ministry of Finance, 2022).

The risks and impacts of ESG issues are often not properly and effectively identified in PPP projects. As a result, PPP projects have a much higher risk of being delayed, more expensive, or even cancelled. The Biak region is sensitive to past, cultural, and environmental issues. To be able to convince investors, this problem must be handled carefully. Ministry of Finance instruments regarding the ESG need to be included in the discussion of the Biak Spaceport financing. Thus, problems that might hinder can be resolved before the PPP project is executed.

Conflict of interest

The authors declare no conflict of interest.

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