

Public Financial Accountability and Distributive Justice in International Space Exploration: A Normative Legal Analysis from Indonesia

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Abstract : *This study examines public financial accountability and distributive justice in international space exploration from a normative legal perspective. Despite the rapid expansion of space activities and the increasing allocation of public funds, international space law remains primarily focused on technical responsibility and liability, while lacking binding norms on fiscal transparency, public financial reporting, and accountability. This normative gap raises concerns regarding the equitable governance of outer space as a global common. Employing normative legal research, this study analyzes key international space law instruments, particularly the Outer Space Treaty (1967) and related conventions, together with Indonesia's national legal framework under Law No. 21 of 2013 on Space Activities. Statutory, conceptual, and comparative approaches are used to assess the adequacy of existing legal norms. The findings reveal an international fiscal accountability gap that undermines the operationalization of the principle of the province of all mankind and contributes to structural inequality in space exploration. At the national level, Indonesia's space law framework is largely declarative and insufficiently integrated with public finance regulation. This study concludes that normative reform is required to strengthen fiscal transparency, accountability, and distributive justice in space governance.*

Keywords : *public financial accountability; distributive justice; international space law; fiscal transparency; space governance*

Abstrak : Penelitian ini mengkaji akuntabilitas keuangan publik dan keadilan distributif dalam eksplorasi ruang angkasa internasional dari perspektif hukum normatif. Meskipun aktivitas keantarkasaan berkembang pesat dan alokasi dana publik semakin meningkat, hukum ruang angkasa internasional masih berfokus terutama pada tanggung jawab teknis dan pertanggungjawaban hukum, sementara norma yang mengikat terkait transparansi fiskal, pelaporan keuangan publik, dan akuntabilitas masih sangat terbatas. Kesenjangan normatif ini menimbulkan persoalan serius terkait tata kelola ruang angkasa yang adil sebagai *global common*.



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Dengan menggunakan metode penelitian hukum normatif, penelitian ini menganalisis instrumen utama hukum ruang angkasa internasional, khususnya *Outer Space Treaty* 1967 dan konvensi-konvensi terkait, serta kerangka hukum nasional Indonesia sebagaimana diatur dalam Undang-Undang Nomor 21 Tahun 2013 tentang Keantariksaan. Pendekatan perundang-undangan, konseptual, dan komparatif digunakan untuk menilai kecukupan norma hukum yang ada. Hasil penelitian menunjukkan adanya kesenjangan akuntabilitas fiskal di tingkat internasional yang menghambat operasionalisasi prinsip *province of all mankind* dan berkontribusi pada ketimpangan struktural dalam eksplorasi ruang angkasa. Pada tingkat nasional, kerangka hukum keantariksaan Indonesia masih bersifat deklaratif dan belum terintegrasi secara memadai dengan regulasi keuangan publik. Penelitian ini menyimpulkan bahwa reformasi normatif diperlukan untuk memperkuat transparansi fiskal, akuntabilitas, dan keadilan distributif dalam tata kelola ruang angkasa.

Kata kunci : akuntabilitas keuangan publik; keadilan distributif; hukum ruang angkasa internasional; transparansi fiskal; tata kelola ruang angkasa

Introduction

In the twenty-first century, outer space exploration has undergone a profound transformation driven by rapid technological advancement and the increasing involvement of non-state actors. Once dominated by a limited number of superpower states, space activities are now characterized by the participation of emerging spacefaring nations and private corporations, resulting in the commercialization and financialization of outer space.¹ This shift has repositioned space exploration from a predominantly scientific endeavor into a global economic activity with substantial fiscal implications, involving extensive public funding, transnational investments, and public-private partnerships.²

Despite this expansion, the contemporary governance of outer space reveals a significant normative tension between economic realities and the foundational principles of international space law. The Outer Space Treaty of 1967 establishes outer space as *the province of all mankind*, mandating that its exploration and use be carried out for the benefit of all countries without discrimination.³ However, in practice, access to space technology, financial resources, and economic benefits remains overwhelmingly concentrated in developed states. This disparity illustrates a structural imbalance between legal ideals and empirical implementation, particularly in relation to fiscal power and technological capacity.⁴

¹ Miriam Tedeschi, Hanna Heino & Andrea Resmini. (2024) A pervasive information approach to urban geography research: the case of Turku. *Geografiska Annaler: Series B, Human Geography* 106:4, pages 387-405.

² OECD, *Space Economy Report 2024: Trends and Outlook in Global Space Investment* (OECD Publishing 2024); Euroconsult, *Satellite Markets Forecast 2025* (Euroconsult 2024).

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967) art I.

⁴ Jakhu RS and Pelton JN, 'Global Space Governance and the New Space Economy' (2017) 44 *Journal of Space Law* 1.

The growing scale of public expenditure in space activities further amplifies concerns regarding public financial accountability. Global space budgets have increased significantly over the past decade, yet international space law instruments, such as the Outer Space Treaty (1967), the Liability Convention (1972), and the Registration Convention (1976), primarily regulate technical responsibility and liability for physical damage, rather than transparency in the allocation, management, and auditing of public funds.⁵ Consequently, the current legal framework lacks binding norms that ensure fiscal transparency and public accountability in space-related expenditures, creating what may be described as an *international fiscal accountability gap*.⁶

This normative gap has direct implications for distributive justice in outer space governance. While the principle of *province of all mankind* implies equitable access and benefit-sharing, the absence of enforceable fiscal and accountability mechanisms enables economically powerful states and private entities to dominate space activities without corresponding obligations to ensure fair distribution of benefits. The resulting asymmetry risks transforming outer space into a domain of economic hegemony rather than a shared global common, thereby undermining the moral and legal foundations of international space law.⁷

From the perspective of developing countries, including Indonesia, these challenges are particularly acute. Indonesia has established a national legal framework for space activities through Law No. 21 of 2013 on Space Activities; however, this legislation remains largely declarative in nature. It does not provide specific mechanisms for public financial reporting, auditing, or transparency in space-related expenditures, nor does it explicitly integrate principles of distributive justice into national space governance.⁸ As a result, there exists a *national implementation gap* between Indonesia's general public finance laws and its space law regime, weakening accountability and limiting the equitable realization of space-related benefits.⁹

Given these conditions, the issue of public financial accountability in outer space exploration emerges as a critical legal concern situated at the intersection of international law, public finance, and distributive justice. Addressing this issue is essential not only to uphold the normative commitments of international space law but also to ensure that national legal systems, particularly in developing states, function as instruments of social justice. Accordingly, a normative legal analysis that integrates principles of public accountability and distributive justice is required to evaluate existing legal frameworks and to formulate more equitable and transparent models of space governance at both international and national levels.¹⁰

This research offers a significant novelty by positioning public financial accountability as a central normative dimension of outer space governance.

⁵ Convention on International Liability for Damage Caused by Space Objects (1972) 961 UNTS 187; Convention on Registration of Objects Launched into Outer Space (1976) 1023 UNTS 15.

⁶ United Nations Office for Outer Space Affairs (UNOOSA), *Annual Report on the Activities of States in Outer Space 2024* (UN 2024).

⁷ Freeland S and Ireland-Piper D, 'Space Law, Human Rights and Corporate Accountability' (2022) 26 *Journal of International Law and Foreign Affairs* 123.

⁸ Law of the Republic of Indonesia No. 21 of 2013 on Space Activities.

⁹ Bovens M, *Public Accountability in the Twenty-First Century* (Oxford University Press 2022).

¹⁰ R Rawls J, *A Theory of Justice* (revised edn, Harvard University Press 1999).

While existing scholarship on international space law has predominantly focused on issues of sovereignty, liability, militarization, commercialization, and resource utilization, limited attention has been given to the fiscal governance of space activities, particularly the transparency, allocation, and auditing of public funds in space exploration. This study departs from conventional doctrinal analyses by integrating principles of public financial accountability and distributive justice into the interpretation of international space law, especially the Outer Space Treaty, the Liability Convention, and the Registration Convention.

Furthermore, this research introduces a multi-level normative framework that connects international legal principles with national implementation mechanisms, using Indonesia's Law No. 21 of 2013 on Space Activities as a contextual case study. By examining the interaction between international obligations and domestic public finance governance, this study advances a conceptual model that bridges the gap between declarative legal commitments and operational fiscal accountability. In doing so, it reframes the principle of the "province of all mankind" not merely as an aspirational statement of collective interest, but as a principle that demands enforceable fiscal transparency and equitable benefit distribution.

The urgency of this research lies in the rapid commercialization and financialization of outer space in the New Space era, where expanding public-private partnerships and transnational investments have significantly increased public expenditure without corresponding international standards on fiscal oversight and accountability. This legal vacuum risks deepening structural inequalities and allowing economically dominant actors to consolidate control over space resources without redistributive obligations. For developing countries such as Indonesia, limited fiscal capacity combined with weak accountability mechanisms heightens the risks of inefficiency, misallocation, and diminished public trust. Without normative reform, the fiscal accountability gap may undermine the legitimacy of international space law itself, shifting outer space governance away from a shared global common toward economic concentration.

Methods

This study employs normative legal research as its primary methodology, focusing on the analysis of legal norms governing public financial accountability and distributive justice in international space exploration.¹¹ This approach is appropriate because the study examines the coherence, adequacy, and normative gaps of existing international and national legal frameworks rather than empirical practices. The research applies statutory and doctrinal approaches by analysing key international space law instruments, including the Outer Space Treaty (1967), the Liability Convention (1972), the Registration Convention (1976), and relevant United Nations General Assembly resolutions and soft law developed under the United Nations Office for Outer Space Affairs (UNOOSA). These instruments are assessed to determine the extent to which they regulate fiscal transparency, public accountability, and

¹¹ Peter Mahmud Marzuki, *Legal Research: A Normative Perspective* (Kencana 2019); Terry Hutchinson and Nigel Duncan, 'Defining and Describing What We Do: Doctrinal Legal Research' (2012) 17 *Deakin Law Review* 83.

equitable benefit-sharing in space activities.¹²

In addition, the study adopts conceptual and theoretical approaches to clarify the meaning of public financial accountability and distributive justice within international space law, drawing on established legal and governance theories.¹³ A comparative legal approach is used to position Indonesia's legal framework, particularly Law No. 21 of 2013 on Space Activities, within broader international practices. This is complemented by vertical and horizontal normative analyses to examine the consistency between international space law, Indonesia's national space regulation, and its public finance accountability framework.¹⁴ Primary legal materials consist of international treaties and national legislation, supported by secondary sources such as scholarly literature and reports from international organizations, which are analysed through qualitative normative legal analysis.

Result And Discussion

Public Financial Accountability in the International Space Law Regime

The normative analysis demonstrates that the current international space law regime fails to establish binding and comprehensive standards for public financial accountability in outer space activities. Core instruments of international space law—most notably the Outer Space Treaty (1967), the Liability Convention (1972), and the Registration Convention (1976)—are predominantly oriented toward regulating state responsibility, liability for damage, and administrative transparency related to space objects. Their regulatory focus remains largely technical and jurisdictional, aiming to prevent physical harm, clarify attribution, and ensure the orderly conduct of space activities. Consequently, these instruments do not meaningfully address how public funds allocated for space exploration are planned, managed, reported, or audited, despite the increasing scale of public investment in space programs.¹⁵

Article VI of the Outer Space Treaty establishes state responsibility for national activities in outer space, including those conducted by non-governmental entities, and requires authorization and continuing supervision by the state. However, this responsibility is framed narrowly in terms of compliance and control over space activities, without extending to obligations of fiscal transparency, public financial reporting, or accountability for the use of public resources. Likewise, Article VII of the Outer Space Treaty and the Liability Convention focus on compensation for damage caused by space objects, reflecting a post-incident liability model rather than a preventive or governance-oriented approach to public expenditure. These provisions treat

¹² Terry Hutchinson, 'Doctrinal Research: Researching the Jury' in Dawn Watkins and Mandy Burton (eds), *Research Methods in Law* (Routledge 2017).

¹³ Mark Bovens, *Public Accountability in the Twenty-First Century* (Oxford University Press 2022); John Rawls, *A Theory of Justice* (revised edn, Harvard University Press 1999).

¹⁴ Malcolm N Shaw, *International Law* (9th edn, Cambridge University Press 2021) 101–105.

¹⁵ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (opened for signature 27 January 1967, entered into force 10 October 1967) 610 UNTS 205 art VI.

financial responsibility only because of harm, not as an integral aspect of good governance in space activities.¹⁶

As a result, international space law exhibits a clear fiscal accountability gap, allowing states to commit substantial public funds to space exploration without corresponding international legal duties to ensure transparency, independent oversight, or equitable allocation of resources. This gap is increasingly problematic considering the growing commercialization of space, public-private partnerships, and the strategic use of public budgets to support national and corporate interests. The absence of binding norms on public financial accountability undermines the principle of outer space as the “province of all mankind,” as it permits unequal access to space benefits and obscures the distributive consequences of public spending decisions. From a critical perspective, this regulatory deficiency reflects a structural bias in international space law that prioritizes technical order and liability over democratic accountability and distributive justice, thereby calling for normative reform to integrate public finance governance into the legal architecture of space activities.¹⁷

Moreover, the lack of international norms on public financial accountability weakens the legitimacy of space governance in an era where space activities are increasingly funded by public budgets but yield benefits that are often concentrated among technologically advanced states and private actors. Without clear legal obligations on transparency and reporting, public expenditures on space programs remain largely shielded from public scrutiny, both domestically and internationally. This condition risks transforming outer space from a shared global domain into an arena of fiscal competition, where state-sponsored projects serve strategic, military, or commercial interests without adequate accountability to taxpayers or the international community. In this sense, international space law has not kept pace with the evolution of space activities from predominantly scientific endeavors to capital-intensive and profit-oriented enterprises.

In addition, the absence of public financial accountability norms has significant implications for distributive justice. The principle that outer space shall be used for the benefit and in the interests of all countries, as articulated in Article I of the Outer Space Treaty, remains largely aspirational when not supported by mechanisms that ensure fair allocation and responsible use of public resources. States with limited financial and technological capacity are structurally disadvantaged, as they lack both access to space activities and influence over how global space resources are funded and utilized. The current legal framework does not provide tools to assess whether public investments in space contribute to inclusive development, capacity building, or equitable benefit-sharing. Consequently, the normative silence on fiscal accountability reinforces existing inequalities and highlights the urgent need for legal development that integrates transparency, accountability, and distributive justice as core principles of international space law.¹⁸

¹⁶ Convention on International Liability for Damage Caused by Space Objects (opened for signature 29 March 1972, entered into force 1 September 1972) 961 UNTS 187.

¹⁷ Bovens (n 3).

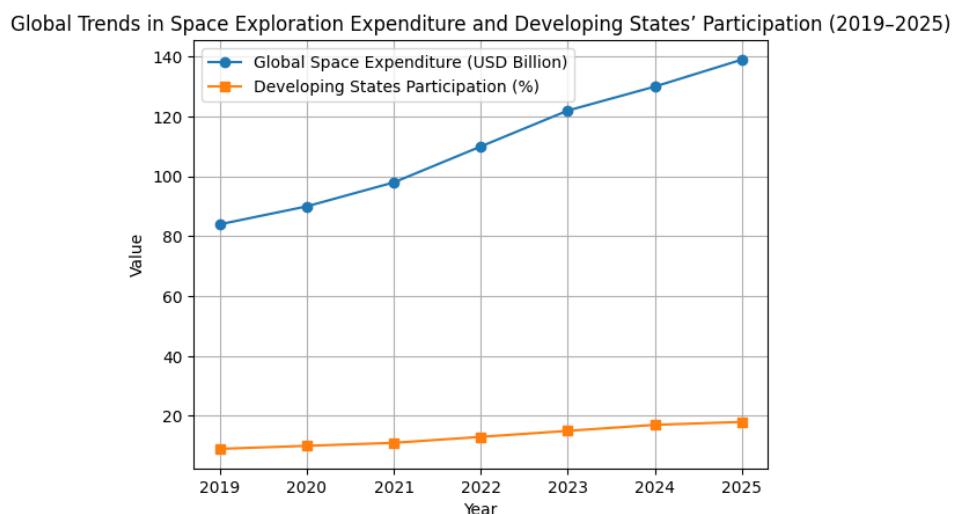
¹⁸ Guyomarc'h, Alban. “Property on Space Resources: The Search for a Terminology”. *Journal of Law, Market & Innovation* 2, no. 2 (July 31, 2023): 71–100

Distributive Justice and Structural Inequality in Space Exploration

The absence of binding norms on public financial accountability has direct implications for the realization of distributive justice in international space exploration. Although Article I of the Outer Space Treaty proclaims that outer space shall be explored and used for the benefit and in the interests of all countries, the current legal framework does not establish operational mechanisms to ensure equitable access, benefit-sharing, or fiscal redistribution.¹⁹

The structural imbalance in international space exploration is further illustrated by empirical data on global space expenditure and the level of participation of developing states, as shown in Figure 1.²⁰

Figure 1. Global Trends in Space Exploration Expenditure and Developing States' Participation (2019–2025)



Source: OECD, *Space Economy Report 2024*; Euroconsult, *Satellite Markets Forecast 2025* (Euroconsult 2024); data processed by the author.

Figure 1 demonstrates that while global space expenditure has increased steadily over the observed period, the proportional participation of developing states remains significantly limited. This persistent disparity reflects a clear fiscal and technological asymmetry in international space activities. From a normative legal perspective, such inequality indicates that the principle of *the province of all mankind* has not been effectively operationalized through existing legal instruments, particularly in relation to benefit-sharing and public financial accountability.²¹

Without transparency regarding public investment, cost allocation, and economic returns derived from space activities, it becomes legally and normatively difficult to assess whether the exploitation of outer space resources aligns with principles of distributive justice. The absence of fiscal disclosure mechanisms allows economically powerful states and private

¹⁹ Outer Space Treaty (n 5) art I.

²⁰ OECD, *Space Economy Report 2024: Trends and Outlook in Global Space Investment* (OECD Publishing 2024); Euroconsult, *Satellite Markets Forecast 2025* (Euroconsult 2024).

²¹ Ram S Jakhu and Joseph N Pelton, 'Global Space Governance and the New Space Economy' (2017) 44 *Journal of Space Law* 1.

actors to dominate space activities, thereby reinforcing structural inequalities and undermining the collective character of outer space as a global common.²²

The implications of this imbalance extend beyond unequal participation and directly affect the normative legitimacy of international space governance. When public funds are allocated to space programs without accompanying obligations of transparency and accountability, it becomes impossible to evaluate whether such expenditures genuinely serve the collective interests of the international community. The absence of binding fiscal norms weakens the ability of international institutions to monitor how public investments in space contribute to shared scientific advancement, peaceful use, and sustainable development. As a result, distributive justice remains largely rhetorical, rather than being translated into concrete legal and institutional arrangements.

Furthermore, the data illustrated in Figure 1 highlight that increasing global space expenditure does not automatically lead to broader inclusion or equitable benefit-sharing. Instead, the concentration of financial capacity and technological expertise among a limited number of states enables them to shape the priorities and outcomes of space exploration.²³ Developing states, despite being formally entitled to benefit from outer space as a global commons, remain marginal actors due to structural financial constraints. This situation reveals a disconnect between the normative aspirations of international space law and its practical outcomes, underscoring the need for legal mechanisms that link public spending with obligations to promote inclusivity, capacity-building, and technology transfer.²⁴

From a critical legal perspective, the lack of fiscal accountability mechanisms also facilitates the growing influence of private actors operating under state authorization, as envisaged in Article VI of the Outer Space Treaty. Public resources are increasingly used to support public-private partnerships and commercial ventures in space, yet the distribution of resulting benefits is rarely subjected to public scrutiny or international oversight. Without mandatory disclosure of public funding, cost-sharing arrangements, and economic returns, the exploitation of outer space risks being driven by market logic rather than collective welfare. This reinforces the urgency of integrating public financial accountability into international space law as a means of operationalizing distributive justice and preserving outer space as a genuinely shared domain.

Indonesia's National Legal Framework and Normative Implementation Gaps

The analysis of Indonesia's national legal framework reveals a similar pattern of normative insufficiency. Law No. 21 of 2013 on Space Activities establishes the legal foundation for national space governance, emphasizing state control, licensing, and responsibility. However, the law does not explicitly regulate

²² Freeland S and Ireland-Piper D, 'Space Law, Human Rights and Corporate Accountability' (2022) 26 *Journal of International Law and Foreign Affairs* 123.

²³ Qin, H.X., Wang, Y. & Hui, P. Identity, crimes, and law enforcement in the Metaverse. *Humanit Soc Sci Commun* 12, 194 (2025)

²⁴ Cross, Mai'a K. Davis, and Saadia M. Pekkanen. "Introduction. Space Diplomacy: The Final Frontier of Theory and Practice", *The Hague Journal of Diplomacy* 18, 2-3 (2023)

public financial accountability, nor does it mandate sector-specific financial reporting or auditing mechanisms for space-related expenditures.²⁵

Although Indonesia's public finance laws provide overarching principles of accountability and audit, these instruments are not systematically integrated into the space governance framework. This regulatory fragmentation results in a national implementation gap, where public funds allocated to space activities remain subject to general fiscal oversight but lack transparency tailored to the specific risks, costs, and international dimensions of space exploration.²⁶

This implementation gap becomes particularly significant given the capital-intensive and long-term nature of space activities. Space programs involve complex procurement processes, cross-border cooperation, advanced technology development, and substantial public investment with delayed or uncertain returns. Without sector-specific financial accountability norms, it is difficult to assess whether public spending on space activities is efficient, proportionate, and aligned with national development priorities. The absence of tailored financial reporting standards also limits parliamentary oversight and informed public scrutiny over strategic budgetary decisions in the space sector.²⁷

Moreover, Indonesia's increasing engagement in international and regional space cooperation heightens the need for clearer fiscal governance. Participation in satellite development, launch services, and data-sharing initiatives often involves co-financing arrangements and shared liabilities. In the absence of explicit rules on financial disclosure and cost allocation within the national space law framework, Indonesia risks legal and financial exposure, particularly in cases of project failure, cost overruns, or international disputes. This gap weakens the state's capacity to demonstrate compliance with international responsibility while ensuring domestic accountability for public expenditure.

The regulatory silence on public financial accountability also affects the governance of non-state actors operating under state authorization. Law No. 21 of 2013 allows private entities to participate in space activities through licensing mechanisms, yet it does not establish clear obligations regarding the use of public subsidies, incentives, or state-supported infrastructure. As a result, public funds may indirectly support commercial space activities without adequate safeguards to ensure transparency, equitable benefit-sharing, or protection of the public interest. This situation mirrors the broader challenges identified at the international level, where commercialization advances faster than accountability frameworks.²⁸

From a normative perspective, these deficiencies indicate that Indonesia's national space law has not fully internalized the principles of good governance and distributive justice embedded in international space law. While the state formally assumes responsibility for national space activities, this responsibility remains largely technical and administrative, rather than fiscal and distributive. Strengthening the integration of public financial

²⁵ Law of the Republic of Indonesia No. 21 of 2013 on Space Activities.

²⁶ Malcolm N Shaw, *International Law* (9th edn, Cambridge University Press 2021) 101–105.

²⁷ United Nations Office for Outer Space Affairs (UNOOSA), *Annual Report on the Activities of States in Outer Space 2024* (United Nations 2024).

²⁸ Law of the Republic of Indonesia No 21 of 2013 on Space Activities.

accountability into the national space governance framework would therefore be essential to bridge the gap between international obligations and domestic implementation, enhance institutional legitimacy, and ensure that space activities contribute meaningfully to broader social and developmental objectives.²⁹

Integrating Accountability and Justice: Normative Implications

The combined findings at the international and national levels indicate that existing legal frameworks remain predominantly declarative rather than operational with respect to public financial accountability and distributive justice. At the international level, space law emphasizes peaceful use and responsibility without addressing fiscal governance. At the national level, Indonesia's space law establishes institutional authority without embedding transparency and accountability as core regulatory principles.³⁰

Normatively, this fragmentation underscores the necessity of integrating public financial accountability into the legal architecture of space governance. Binding fiscal transparency obligations would not only enhance democratic oversight but also strengthen distributive justice by enabling a more equitable assessment of benefit allocation among states.

A deeper normative reading of these findings suggests that the absence of fiscal accountability mechanisms is not merely a technical omission, but a structural weakness in contemporary space governance. When public financial accountability is excluded from the regulatory core, space activities are implicitly treated as value-neutral technological enterprises rather than as public policy choices with distributive consequences. This framing obscures critical questions concerning who bears the financial risks of space exploration, who captures its economic benefits, and how public resources are prioritized in relation to competing social needs. As a result, the legal regime fails to reflect the inherently political and redistributive dimensions of space activities.³¹

Integrating accountability into space law would therefore serve a constitutive function, redefining space governance as an area of public finance and social justice rather than solely of scientific and strategic interest. At the international level, the introduction of minimum standards on fiscal transparency, such as reporting obligations on public expenditure, disclosure of public-private financing structures, and cooperative auditing mechanisms, could transform the principle of the benefit of all countries into an operational legal benchmark. Such measures would not require uniform budgetary systems, but rather a shared normative commitment to openness and evaluability in the use of public funds for space activities.³²

At the national level, embedding public financial accountability within Indonesia's space governance framework would enhance coherence between space law and general public finance regulation. This integration would

²⁹ Jakhu and Pelton (n 11).

³⁰ Freeland and Ireland-Piper (n 12).

³¹ Outer Space Treaty (n 5) arts I, VI–VII.

³² Supancana, I.B.R. (2022). Indonesian Space Policy, Regulations and Programs: Past Achievements and Future Prospects. In: Verspieren, Q., Berthet, M., Coral, G., Nakasuka, S., Shiroyama, H. (eds) ASEAN Space Programs. Springer, Singapore

strengthen institutional checks and balances by linking licensing, authorization, and supervision of space activities to explicit fiscal disclosure and audit requirements. Normatively, this approach would reaffirm that public investment in space is subject to the same standards of accountability as other sectors of public spending, thereby reinforcing democratic legitimacy and public trust in national space policies.³³

Ultimately, the integration of accountability and distributive justice has broader implications for the future of outer space as a global commons. Without transparent and accountable financial governance, the expansion of space activities risks entrenching existing inequalities and accelerating the concentration of benefits among technologically advanced states and private actors.³⁴ By contrast, a normative framework that aligns fiscal accountability with distributive justice would contribute to a more inclusive and equitable space order, ensuring that the exploration and use of outer space genuinely reflect its legal characterization as the province of all mankind.

Conclusion

This study demonstrates that the current international space law regime remains normatively inadequate in addressing public financial accountability and distributive justice in outer space exploration. While foundational instruments such as the *Outer Space Treaty* (1967) establish general principles of peaceful use and state responsibility, they do not impose binding obligations concerning fiscal transparency, public financial reporting, or audit mechanisms for space-related expenditures. As a result, significant public funds may be allocated to space activities without meaningful international legal oversight, giving rise to an international fiscal accountability gap.

The absence of enforceable accountability norms has direct implications for distributive justice. Although the principle of *the province of all mankind* implies equitable access and shared benefits, existing legal instruments fail to operationalize this principle through concrete mechanisms of benefit-sharing or fiscal responsibility. Consequently, international space exploration continues to be characterized by structural inequality, where technologically and economically advanced states dominate access, decision-making, and economic returns, while developing states remain marginal participants.

At the national level, the analysis reveals that Indonesia's legal framework reflects similar normative limitations. Law No. 21 of 2013 on Space Activities establishes institutional authority and state responsibility but does not integrate public financial accountability or distributive justice as substantive regulatory principles. The lack of linkage between space governance and public finance law results in a national implementation gap, weakening transparency and limiting the capacity of national law to function as an instrument of social justice in the space sector. Taken together, these findings indicate that both international and national space law regimes are predominantly declarative rather than operational with respect to fiscal accountability and equitable governance. Without normative reform, the legal

³³ Bovens (n 3).

³⁴ Lawrence, A., Rawls, M.L., Jah, M. et al. The case for space environmentalism. *Nat Astron* 6, 428–435 (2022)

architecture governing outer space risks reinforcing fiscal asymmetries and undermining the collective character of outer space as a global common.

Recommendation

Considering these conclusions, this study advances several normative and policy-oriented recommendations aimed at strengthening public financial accountability and distributive justice in space governance.

First, at the international level, there is a pressing need to develop binding legal standards on fiscal transparency and public financial accountability in space activities. Existing soft law initiatives under the United Nations Office for Outer Space Affairs (UNOOSA) should be progressively consolidated into a formal international framework that mandates financial disclosure, audit mechanisms, and reporting obligations for publicly funded space activities. Such a framework would enhance democratic oversight and align space governance with broader developments in global fiscal governance.

Second, principles of distributive justice should be explicitly operationalized within international space law. This may be achieved through the incorporation of benefit-sharing mechanisms, capacity-building obligations, and technology-transfer provisions that enable developing states to participate more equitably in space exploration. Translating the principle of *the province of all mankind* from a declarative norm into an operational legal standard is essential to preserving the legitimacy of international space law.

Third, at the national level, Indonesia should strengthen its domestic space law by integrating public financial accountability into the regulatory framework governing space activities. This can be accomplished through the adoption of implementing regulations under Law No. 21 of 2013 that mandate sector-specific financial reporting, transparency requirements, and audit procedures for space programs funded by public resources.

Finally, Indonesia may play a strategic role in advancing normative reform at the international level by promoting fiscal accountability and distributive justice as core principles in multilateral space governance forums. By aligning national reform with international advocacy, Indonesia can contribute to the evolution of a more equitable, transparent, and accountable legal regime for outer space.

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