

ORIGINAL ARTICLE



The Urgency of Regulating Air Rights and Transfer of Development Rights (TDR) in Indonesia's Land Law System: A Jakarta Case Study

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Article History

Received
21 June 2025

Accepted
23 November 2025

Available Online
30 November 2025

Keywords

Air rights
Transfer of development rights
Agrarian law
Spatial planning
Vertical development

Abstract

Jakarta faces severe land constraints due to its high population density (over 14,000 people per sq km). This pressure has driven vertical development and innovative urban projects, highlighting the urgency for clear legal frameworks on air rights and Transfer of Development Rights (TDR). Air rights refer to the ability to use or develop the space above land, while TDR is a planning tool allowing the transfer of unused building potential from one parcel to another. Currently, Indonesia's land law system lacks explicit regulations for these concepts, creating legal uncertainties and limiting urban planners' flexibility. This research examines the need for formalizing air rights and TDR in Indonesian agrarian law, using Jakarta as a case study. A comparative analysis with practices in the United States and Singapore is conducted to glean insights into how robust air rights and TDR regimes can guide sustainable urban growth. Findings indicate a significant regulatory gap: existing laws (e.g., Basic Agrarian Law of 1960) do not accommodate separate airspace utilization or development rights trading. International examples demonstrate that well-regulated air rights and TDR mechanisms help preserve essential spaces (farmland, heritage sites) while promoting strategic densification. The study concludes with recommendations (*ius constituendum*) for Indonesian legal reforms to integrate air rights and TDR, ensuring Jakarta and other cities can optimize vertical space and direct development in a controlled, equitable manner.

1. Introduction

Jakarta, the capital city of Indonesia, faces acute land scarcity resulting from rapid urbanization and sustained population growth [1]. With an area of approximately 4,384 km² and a population exceeding ten million, the city's density surpasses 14,000 inhabitants per km², placing significant pressure on its limited physical footprint [2]. This spatial constraint has driven an intensification of vertical development, reflected in the proliferation of high-rise buildings, multi-level infrastructure, and numerous transit-oriented development initiatives [3]. Despite these trends, the legal framework governing the use of urban airspace and the transfer of development rights has not evolved in tandem with the pace of physical development [4]. Indonesia's existing land and spatial planning laws do not yet provide clear mechanisms for the allocation, separation, or transfer of rights above ground level, creating structural barriers to integrated urban planning [5,6].

The concept of air rights refers to the legal authority to utilize or develop the space above land or infrastructure [4]. In many advanced jurisdictions, air rights have developed into tradable property interests, enabling municipal governments and private actors to capitalize on

underutilized airspace [7]. In dense global cities such as New York, development rights above rail stations or major roadways can be sold to private developers, allowing the conversion of idle public airspace into productive economic assets [7]. A related concept, Transfer of Development Rights (TDR), functions as a planning instrument that permits landowners to relocate or sell their unused development capacity to other sites [8,9]. This mechanism is commonly employed to preserve open spaces or heritage structures by redirecting development pressure toward designated growth areas [8].

Indonesia has yet to formally regulate either air rights or TDR. Although the 1960 Basic Agrarian Law acknowledges the right to use airspace in Article 48, the provision is framed in traditional terms relating to natural forces rather than modern spatial stratification [5,10]. Furthermore, the Law requires a government regulation to operationalize airspace rights, but no such regulation has been issued [5]. As a result, Indonesia lacks a legal foundation for establishing horizontally separated rights above land parcels or for enabling collaborative public-private use of elevated space. The absence of explicit regulation has generated a significant legal gap [5]. For example, the Jakarta provincial government once proposed auctioning airspace rights to finance public infrastructure, recognizing the potential value of airspace, underground areas, and reclaimed land as strategic assets [11]. The proposal, however, stalled due to unclear legal procedures for airspace transactions. A similar issue arose during the Jakarta Monorail project, where investors sought to build a commercial facility above a government-owned depot. The proposal was ultimately rejected because it shifted the project's focus toward property development and lacked legal certainty, illustrating how ambiguous regulations can impede innovative financing and create conflicts of interest.

TDR has likewise seen limited application in Indonesia. While the mechanism is widely used internationally to balance environmental protection, heritage conservation, and economic growth, Indonesia has not established a formal system for development rights transfers [8]. Jakarta is the only city known to have experimented with a rudimentary form of TDR through its 2014 Detailed Spatial Plan. The regulation grants additional floor area ratio to developers who provide public green space, effectively reallocating development capacity within a single zone. However, the scheme is constrained to lot merging within the same planning block and does not reflect the broader function of TDR, which enables transfers across different zones and supports long-range planning objectives [12]. Consequently, TDR implementation in Jakarta has produced limited outcomes and has not yet contributed meaningfully to citywide spatial governance.

These conditions underscore critical research questions: why is regulatory intervention on air rights and TDR increasingly urgent within Indonesia's land governance system, particularly in addressing Jakarta's complex urban challenges? What legal gaps currently hinder their operation, and what reforms are necessary to establish a coherent regulatory framework? How can established practices in jurisdictions such as the United States and Singapore inform Indonesia's institutional development?

This research aims to examine the urgency of regulating air rights and TDR within Indonesia's agrarian and spatial planning laws, identify regulatory deficiencies related to vertical spatial use and development rights transfers, analyze international best practices, and formulate legal recommendations for integrating air rights and TDR into national and regional frameworks, with Jakarta serving as a principal case study. The study seeks to contribute to the advancement of agrarian and urban policy in Indonesia by demonstrating how a comprehensive and modernized legal framework can enhance spatial governance, strengthen legal certainty, and support sustainable urban development. The subsequent sections outline the research methodology, present the central findings, and conclude with proposed regulatory reforms.

2. Methods

This study adopts a normative juridical methodology [13–15]. Supported by a descriptive-analytical approach to examine the regulatory landscape governing air rights and Transfer of Development Rights (TDR) in Indonesia [16]. The primary materials consist of statutory instruments, particularly the 1960 Basic Agrarian Law, spatial-planning legislation, and relevant ministerial regulations issued by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN). These are supplemented by official policy documents that articulate the state's institutional stance on land and urban governance [17]. Secondary materials include academic literature, journal articles, technical reports, and documented case studies that provide conceptual and comparative insights [17]. The study integrates a comparative legal method to assess how air rights and TDR are structured and operationalized in the United States and Singapore, two jurisdictions whose regulatory experiences offer functional relevance for Indonesia due to their mature systems of vertical property rights and urban-development controls.

Data analysis is conducted qualitatively and proceeds through three structured stages [18]. The first stage involves content analysis of legal texts, including the Basic Agrarian Law, subordinate regulations, and the Detailed Spatial Plan (RDTR) of Jakarta, to evaluate the presence, absence, or ambiguity of legal provisions concerning airspace utilization and transferable development rights. The second stage applies a gap analysis that contrasts the existing legal framework with the practical needs that emerge from ongoing urban development, illustrated through Jakarta's transit-oriented development initiatives and elevated infrastructure projects. This allows the study to identify the regulatory discontinuities that inhibit effective governance of vertical spatial assets. The third stage employs comparative analysis using international literature, including World Bank studies and high-impact publications, to distill how air rights and TDR have been developed as regulatory tools in other jurisdictions and what institutional conditions enable their effective implementation.

To contextualize these analytical stages, the research incorporates an exploratory case study of Jakarta by examining projects such as the Dukuh Atas skybridge proposal and the former monorail initiative, both of which exemplify the practical challenges arising from the absence of explicit legal mechanisms governing airspace rights. Insights produced through these three stages are systematically synthesized to formulate *ius constituendum* recommendations aimed at informing future legal reform in Indonesia.

3. Results and Discussion

3.1. The Concept of Air Rights and Transfer of Development Rights (TDR)

Air rights refer to the legal authority to use or develop the space above a parcel of land or an existing structure, independently of the ownership of the surface beneath it. Classical agrarian doctrine, expressed in the maxim *cuius est solum, eius est usque ad coelum et ad inferos*, assumes that ownership extends vertically without limit [19,20]. Modern legal systems, however, place boundaries on this principle to protect public interests and to accommodate the spatial demands of contemporary cities. In current scholarship, air rights are understood as a form of development potential that can be separated, transferred, and monetized. This arrangement allows landowners to retain their land while selling unused development capacity above it, and it also enables governments to authorize construction above public infrastructure such as roads or stations. In practice, this creates new buildable space within dense urban environments.

TDR complements this concept by allowing development potential to be moved from one parcel to another. It distinguishes between the ownership of the land itself and the right to build on that land. In a TDR scheme, owners in protected or environmentally sensitive zones may relinquish their development rights in exchange for compensation, while owners in areas

suitable for growth acquire these rights to increase density. This mechanism allows land that should remain undeveloped to be preserved, while directing growth toward locations that can support it. Together, air rights and TDR provide important tools for three-dimensional urban planning and for managing density in rapidly growing cities.

3.2. Indonesia's Legal Framework for Land and Development Rights

Indonesia's Basic Agrarian Law of 1960 (UUPA) defines major categories of land rights and acknowledges the existence of rights related to airspace [20]. Articles 4(2), 16, and 48 refer to what is termed *hak guna ruang angkasa*, although these provisions stem from traditional ideas of land use and do not offer a clear legal basis for constructing physical structures above ground level. Importantly, the implementing regulation required by Article 48 has never been issued. As a result, airspace rights exist only conceptually and lack practical legal mechanisms.

In practice, elevated development is carried out through indirect arrangements. These include granting building-use rights (HGB) over state land, allocating management rights (HPL) to government entities, or using contractual agreements for the temporary use of public airspace. None of these arrangements ensure long-term tenure security, which complicates large-scale investments that require predictable legal standing. Indonesia's spatial planning law regulates development intensity through floor area ratios (FAR), and local governments may offer incentives for additional density. Yet these incentives remain administrative decisions, not market-driven transfers of development rights among private parties. Consequently, Indonesia does not currently have a legal structure that allows development rights to be moved across zones or between owners, which is the core feature of TDR.

Recent policy initiatives, including the Ministry of ATR/BPN Regulation No. 10 of 2021 on RDTR guidelines, introduce the possibility of using TDR and air rights within detailed zoning plans. Despite this progress, their implementation remains limited without a stronger regulatory foundation at the national level. Indonesia therefore lacks a coherent legal system for managing vertical space in dense urban areas.

3.3. Legal Gaps and the Urgency for Reform

Several gaps highlight the need for a clear regulatory framework. First, there is no legal definition or mechanism that explains how airspace rights can be separated, transferred, or formally registered. Investors who wish to build above public roads or other state assets do not have legal certainty regarding the duration or protection of their rights. Second, the absence of a TDR system prevents landowners in protected areas from being compensated through the sale of development potential. This limitation increases financial pressure on governments to acquire land outright, particularly in flood-prone areas, river corridors, and heritage districts.

Third, the absence of explicit legal recognition of air rights restricts the use of airspace as an innovative funding source for infrastructure. Cities such as Jakarta increasingly need to explore creative financing, yet large projects are forced to rely on temporary agreements that offer little long-term security. Fourth, Indonesia's rapid urban growth, especially in transit-oriented development areas, requires advanced management of vertically layered property rights. Complex nodes such as Dukuh Atas depend on elevated walkways, integrated stations, and commercial linkages, but existing laws do not provide a stable foundation for granting or transferring rights within these vertical configurations.

These limitations create legal uncertainty and reduce the ability of cities to experiment with more efficient urban forms. A stronger legal structure for air rights and TDR would support sustainable development goals by providing clear rules for conservation, growth management, and vertical expansion.

3.4. International Practice: Experience from the United States and Singapore

The United States provides a well-established model for both air rights and TDR. Air rights transactions are common above railway lines, highways, and major public facilities. One prominent example is the redevelopment of the rail yards on Manhattan's West Side, known as Hudson Yards, where large commercial districts were built above active rail tracks [21]. New York City's zoning system operationalizes air rights through zoning lot mergers that allow unused development rights to be aggregated. The legal foundation for this approach was strengthened by the *Penn Central* decision in 1978, in which the United States Supreme Court upheld the use of TDR as a legitimate form of compensation for property owners affected by preservation rules [22]. Across the country, TDR programs help protect farmland, manage growth in suburban regions, and guide development into centers with stronger infrastructure networks. This system functions effectively when zoning enforcement is reliable, land information systems are accurate, and government agencies provide support through tools such as TDR banks.

Singapore offers a different but equally instructive example. As a highly dense city-state, Singapore relies on a centralized planning model under the Urban Redevelopment Authority (URA). Although Singapore does not operate a market-based TDR system, it achieves similar objectives by offering bonus gross floor area to developers who contribute public amenities or restore heritage buildings. These incentives effectively redistribute development potential under close government supervision. Singapore also uses airspace and underground space extensively for connecting transport systems, commercial activities, and urban amenities. Highly detailed cadastral mapping and precise strata titling allow ownership of space above or below the ground. This coordinated regulatory environment shows that even without a formal TDR market, density can be directed and preserved effectively through a combination of incentives and strong administrative control.

3.5. Case Studies from Jakarta's Vertical Development

Jakarta illustrates the growing need for a more mature approach to vertical land governance [23]. The city's efforts to build transit-oriented districts depend on complex integration between multiple transportation modes and the surrounding urban fabric. The proposed circular skybridge in Dukuh Atas, designed to connect pedestrian pathways and host commercial activities above a major intersection, demonstrates how airspace can create new mobility and economic functions. The project is expected to accommodate tens of thousands of pedestrians daily. However, because it occupies the airspace above public roads, its development depends on temporary cooperation agreements rather than secure long-term rights [24].

Jakarta's 2014 Detailed Spatial Plan includes a limited form of TDR by allowing developers who contribute land for public green space to transfer their remaining development potential to nearby parcels [25]. This concept reflects TDR principles, although it operates only within narrow boundaries and lacks the broader legal support needed for effective implementation [26]. The canceled Jakarta Monorail project shows the legal difficulty of managing airspace above state assets. The investor sought to construct a commercial complex above the monorail depot to support the project's financial viability, but the absence of clear rules for transferring or assigning airspace rights prevented the agreement from moving forward.

These cases highlight Jakarta's position as an early testing ground for vertical development in Indonesia. Local actors have begun to recognize the value of air rights and TDR, yet their efforts remain constrained by the absence of national-level regulations. Without reform, projects involving elevated structures will continue to face legal uncertainty and operational challenges.

4. Conclusions

This study demonstrates that Jakarta's intensifying vertical development, driven by acute land scarcity and rapid urbanization, exposes fundamental deficiencies in Indonesia's agrarian and spatial-planning laws, particularly the absence of clear mechanisms for regulating air rights and transferring development rights. Although the 1960 Basic Agrarian Law conceptually acknowledges airspace use, its outdated formulation and the lack of implementing regulations prevent the separation, registration, and transfer of vertically stratified rights, thereby hindering innovative public-private development in elevated space. A normative juridical analysis, supported by gap assessment and comparative insights from the United States and Singapore, confirms that Indonesia lacks the legal certainty, administrative structure, and market instruments necessary to operationalize air rights and TDR as effective governance tools. International experience shows that mature legal frameworks, enforceable zoning, precise cadastral systems, and coordinated planning institutions are essential for enabling cities to monetize airspace, preserve protected areas, and direct density to strategic growth corridors. Jakarta's case studies, including the Dukuh Atas skybridge proposal, the limited TDR mechanism in the 2014 RDTR, and the stalled monorail project, illustrate how legal ambiguity generates financial risk, obstructs infrastructure innovation, and constrains the city's capacity to manage vertical space. The findings collectively indicate an urgent need for Indonesia to modernize its land-governance regime by developing explicit statutory definitions, procedural rules, and institutional arrangements for air rights and TDR to support integrated spatial planning, strengthen legal certainty, and enable sustainable urban development.

Funding: This study does not receive external funding.

Ethical Clearance: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data is available upon request.

Acknowledgments: The authors would like to express their gratitude to their institutions

Conflicts of Interest: All the authors declare no conflicts of interest.

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