

Registering Underground Rights: Evaluating Deed Standards and Evidence Post-GR 18/2021

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Abstract

Legal certainty regarding the registration of underground space rights remains a critical challenge in Palu City. This issue stems from unclear evidentiary proof of ownership, a lack of standardized authentic deeds, and the absence of an optimal three-dimensional (3D) land administration system. This study analyzes the standard of deeds that Notaries must prepare for agreements granting underground space rights to ensure legal certainty for all parties. Using a normative legal method with statutory and secondary approaches, the study evaluates the formal legal aspects and official authority outlined in Government Regulation Number 18 of 2021. The results indicate that while this regulation significantly advances Indonesian agrarian law by recognizing underground space as a new legal object, its practical implementation faces severe normative and technical obstacles—particularly in 3D mapping and the formulation of standardized deeds. Consequently, this study concludes that establishing explicit standards for authentic Notarial deeds and developing a robust 3D land registration system are urgent prerequisites for achieving true legal certainty.

Kata kunci

Underground Space Rights; Authentic Deeds; Notary; Legal Certainty

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1. INTRODUCTION

Urban expansion continues to accelerate globally, driven by population growth and the increasing demand for public infrastructure (Angel, 2023; Sadewo, 2018). Due to land scarcity on the surface, governments and the private sector must optimize alternative spaces. A primary solution is the utilization of underground space for Mass Rapid Transit (MRT), urban utility networks, storage facilities, and underground parking (Falahiyati et al., 2024; Nirahua et al., 2022). Consequently, subterranean space is no longer viewed merely as an appendage to surface land, but as a distinct legal object with intrinsic economic value and strategic function within modern, sustainable spatial planning. (Ginting, 2022; Wibowo & Kinanggi, 2022)



In Indonesia, underground space management gained formal regulatory attention through Government Regulation Number 18 of 2021 on Land Management Rights, Land Rights, Apartment Units, and Land Registration (GR 18/2021). This regulation marks a new era in the national agrarian law system by explicitly providing a legal foundation for recognizing subterranean rights (AKBAR, 2021; Marryanti & Purbawa, 2019). Underground space was only implicitly captured by the broad concept of state land control in Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA). It remained unregulated as an independent object of rights. The introduction of GR 18/2021 demonstrates a legislative shift toward regulating three-dimensional space, spanning above, on, and below the surface. (Dwiyatmi et al., 2025; Utomo, 2021)

Utilizing subterranean space for transportation, utilities, or commercial ventures requires absolute legal certainty to prevent boundary disputes with surface landowners and third parties. Land registration provides the necessary juridical legitimacy and serves as enforceable evidence of title, offering both preventive and repressive legal protection. (Masnah, 2021; Mujiburohman, 2018)

Despite the mandate of GR 18/2021, practical challenges persist in obtaining evidentiary proof of title and in standardizing authentic deeds. Without resolving these two procedural ambiguities, securing the enforceability of underground rights remains difficult. (Nurmegawati et al., 2019; Rahmawati, 2022)

During the planning process, the developer submitted an application to the Land Office (Badan Pertanahan Nasional; BPN) of Palu City for the registration of rights over underground space (Ansori et al., 2024; Junaedi et al., 2025). However, this process gave rise to issues because the underground space intended for use is located beneath a parcel of land with Building Use Rights (Hak Guna Bangunan; HGB) owned by another party. This situation raises a legal question: whether the holder of surface Building Use Rights (HGB) automatically acquires full rights to the underlying space, or whether the underground space can be partitioned and granted as a new right to a different developer.

The Land Office (BPN) of Palu City (Handayani, A. A., 2019; Marryanti & Purbawa, 2019). emphasized that without clarity regarding the legal relationship between the holder of the surface Building Use Rights (HGB) and the developer, the registration of underground space cannot be carried out. When the developer consulted a Notary, confusion arose about the form of the authentic deed to be prepared. Whether to use a conventional Deed of Sale and Purchase (Akta Jual Beli; AJB) of Building Use Rights (HGB), or whether a specific deed is required that contains detailed specifications of the underground space, including depth, area, coordinate boundaries, and its designated function. Due to the absence of technical regulations concerning the format of such a specific deed, Notaries in Palu City ultimately referred to cooperation agreement deeds and conventional land sale and purchase deeds.

This situation could create legal uncertainty if disputes arise in the future. (Ayu & Heriawanto, 2019; Gunanegara, 2022)

The situation in Palu highlights that while GR 18/2021 establishes the theoretical existence of underground rights, local Land Offices across Indonesia face systemic implementation hurdles. Resolving the evidentiary proof of title requires granular regulations that define the legal nexus between surface and subsurface right-holders. Furthermore, the notary's role is critical in drafting precise instruments (Avivah et al., 2022; Gunanegara, 2022), yet the lack of standardized deed formats invites conflicting interpretations. Legal certainty in this domain ultimately depends on comprehensive regulatory refinement, standardized authentic deeds, and the development of a fully integrated three-dimensional land administration system. (Mujiburohman, 2018; Rudianto & Heriyanto, 2022)

- a. Given this reality, an in-depth analysis of the registration of subterranean rights under GR 18/2021 is highly relevant. This study moves beyond a purely normative assessment of the legal framework to examine empirical challenges, focusing specifically on the evidentiary proof of title and the standardization of notarial deeds. By addressing these gaps, this research provides both theoretical insights for notarial scholarship and practical recommendations for policymakers seeking to refine 3D spatial regulations.
- b. Studies and recommendations for policymakers to refine the regulation of rights over underground space. Based on the foregoing description, the researcher intends to examine this issue in a study entitled "Registering Underground Rights: Evaluating Deed Standards and Evidence Post-GR 18/2021"

Problem Formulation

1. How is the legal regulation concerning rights over underground space?
2. How is the evidentiary proof of title in the registration of rights over underground space?
3. How are the standards of deeds that Notaries must prepare in agreements concerning the granting of rights over underground space to ensure legal certainty?

Scope Limitation

1. Limited to the legal provisions under Government Regulation Number 18 of 2021 concerning underground space.
2. Limited to the evidentiary proof of title in the registration of rights over underground space.
3. Limited to the standards of Notarial deeds to ensure legal certainty.

Research Objective

1. To analyze the legal provisions under Government Regulation Number 18 of 2021 concerning underground space.
2. To analyze the challenges of evidentiary proof of title in the registration of rights over underground space.
3. To analyze the standards of Notarial deeds to ensure legal certainty.

2. METHODS

Type of Research

The research method implemented in this thesis is a normative juridical approach. This type of research focuses on positive law, legal doctrines, and fundamental legal principles directly relevant to the issues under examination (Hutchinson, 2015; Smits, 2017). In contrast to empirical studies that examine social behavior, normative juridical research focuses on the analysis of legal norms as stipulated in regulations and legal literature.

Statutory Approach

The statutory approach involves examining all laws, regulations, and related regulatory instruments relevant to the legal issues under consideration (Jahani Chehrehbargh et al., 2024; Wiwin Marisa, 2025). This approach is used to analyze various relevant legal provisions.³⁵ This approach was carried out by analyzing regulations governing land rights and underground space. Several regulations served as the main legal foundation: Law Number 5 of 1960, Law Number 11 of 2020, and Government Regulation Number 18 of 2021.

Conceptual Approach

The conceptual approach proceeds from the views and doctrines that have developed within legal science.³⁶ An understanding of these views and doctrines serves as a reference in constructing legal arguments to resolve the legal issues at hand (Amelia, 2023; Negara, 2023). This approach was carried out by examining relevant legal concepts, such as legal certainty, land rights, and the role of authentic deeds in land registration. The conceptual approach provides a theoretical foundation that enables the analysis to go beyond the text of the regulations and to explain the underlying philosophical basis and legal principles

Case Approach

The case approach examines cases related to the legal issues at hand that have been decided by courts and have acquired final and binding legal force. These cases may originate from Indonesia or other jurisdictions. The primary focus of the case approach is the *ratio decidendi*, namely the court's reasoning in reaching a decision. For both practical purposes and academic study, the *ratio decidendi*, or reasoning, serves as a reference in constructing legal arguments to resolve legal issues.

This approach was carried out by analyzing concrete cases related to the registration of rights over land and underground space, drawing on both court decisions and land administration practices, for example, at the Land Office (BPN) in Palu City. Case analysis provided a practical illustration of how legal rules are implemented and the obstacles that arose in their application, particularly regarding the evidentiary proof of title and the preparation of deeds.

Sources of Legal Materials

a. Primary Legal Materials

Primary legal materials are binding legal materials (Amin Amirudin & Dwi Fidhayanti, 2025; Wahyu Iswantoro et al., 2025). Primary legal materials are authoritative in nature, meaning that they carry legal authority. They consist of laws and regulations, official records, legislative histories, and judicial decisions. Primary legal materials serve as the principal legal foundation and constitute the core of the analysis conducted in this study (Surahman et al., 2025; Syahdan et al., 2020). These primary legal materials possess binding force because they are derived directly from applicable laws and regulations. In this study, which examines the registration of rights over underground space as regulated under Government Regulation Number 18 of 2021, the primary legal materials used include the following sources:

- 1) Law Number 5 of 1960: This serves as the primary legal basis for land rights regulations in Indonesia. It establishes fundamental principles, such as the social function of land, the Right of Ownership (Hak Milik), the Right to Cultivate (HGU), and the Right to Build (HGB). It also defines the relationship between the State and the earth, water, and space. In the context of underground space, the Basic Agrarian Law (*Undang Undang Pokok Agraria*; UUPA) It is essential as the foundational legal framework for spatial rights, even though specific details were only further regulated through subsequent implementing regulations.

b. Secondary Legal Materials

Secondary legal materials are legal materials that provide explanations of primary legal materials.³⁹ These consist of all legal publications that are not official legal documents. Such legal publications include textbooks, legal dictionaries, legal journals, and commentaries on court decisions (Disemadi, 2022; Sumarna & Kadriah, 2023). Secondary legal materials are sources that provide explanations, commentaries, or interpretations of statutory laws and regulations. Although they do not possess the same binding authority as primary legal materials, their primary value lies in enriching the analysis and broadening the understanding of the issues under study. (Budiana et al., 2026; Sudarmanto et al., 2025)

c. Tertiary Legal Materials

Tertiary legal materials are sources utilized to understand and explain primary and secondary legal materials. Examples include legal dictionaries and encyclopedias, as well as other supporting sources that explain legal terms or concepts (Djabbarudin, 2020; Nirahua et al., 2022). Although they do not have binding legal force, tertiary legal materials are useful for clarifying terminology and providing additional references for analysis. This is expected to make the analysis more precise and to provide both theoretical and practical contributions in the fields of agrarian law and notarial practice.

Technique of Analysis of Legal Materials

The analysis of legal materials in this study used a descriptive–analytical method with a systematic interpretation approach (Ahadi, 2022; Al Ismariy et al., 2026). This study clearly illustrates the legal framework governing the registration of rights over underground space, while also identifying issues arising in practice, such as challenges in proving title by evidence and the need for standards for Notarial deeds. This analysis also contributes to the formulation of theoretical and practical recommendations. (Wibowo & Kinanggi, 2022; Zahratul Muna, 2024)

This method was carried out by first describing (descriptively) the applicable legal provisions, both those contained in regulations and those in legal doctrines (Cahyadi et al., 2024; Laitupa et al., 2022). Subsequently, the researcher conducted an analysis (analytical) to examine the relationship between the existing rules and the issues under study. Through this method, the research not only described the rules but also critically examined their application in the context of registering rights over underground space.

Basic Concept of 3d Cadastre in The Registration of Rights Over Underground Space (AKBAR, 2021; Masnah, 2021). The development of vertical spatial utilization, both above and below the land surface, requires a paradigm shift from a two-dimensional cadastral system (2D cadastre) to a three-dimensional cadastral system (3D Cadastre). This system is not merely a mapping tool but constitutes a legal mechanism capable of indicating the spatial boundaries of rights, encompassing the length, width, and depth of space. (Arliman S, 2018; Rohman et al., 2024)

According to Stoter (2004), a 3D cadastre is a system that records, maps, and represents units of spatial rights in three dimensions as volumetric geometric objects (Döner, 2021; Paulsson & Paasch, 2013). This differs from a 2D cadastre, which represents land parcels only on a flat plane and provides no information on depth or height. The main characteristics of a 3D cadastre include:

- a. Volumetric representation of rights over space in the form of solid geometry.
- b. Recording of vertical boundaries (upper and lower boundaries);
- c. Integration with Geographic Information Systems (GIS);
- d. The ability to represent overlapping rights vertically;

- e. Accuracy of coordinates in three axes: X, Y, and Z.

Relevance of 3D Cadastre in Government Regulation Number 18 of 2021

Government Regulation Number 18 of 2021 recognizes the use of underground space as an object of land rights. However, the successful implementation of this regulation requires the support of 3D cadastre technology to:

- a. Identify the depth of underground space over which rights are granted;
- b. Prevent vertical conflicts between holders of surface rights and holders of underground space rights;
- c. Provide legal certainty regarding spatial boundaries;
- d. Enable the precise registration of rights over underground space.

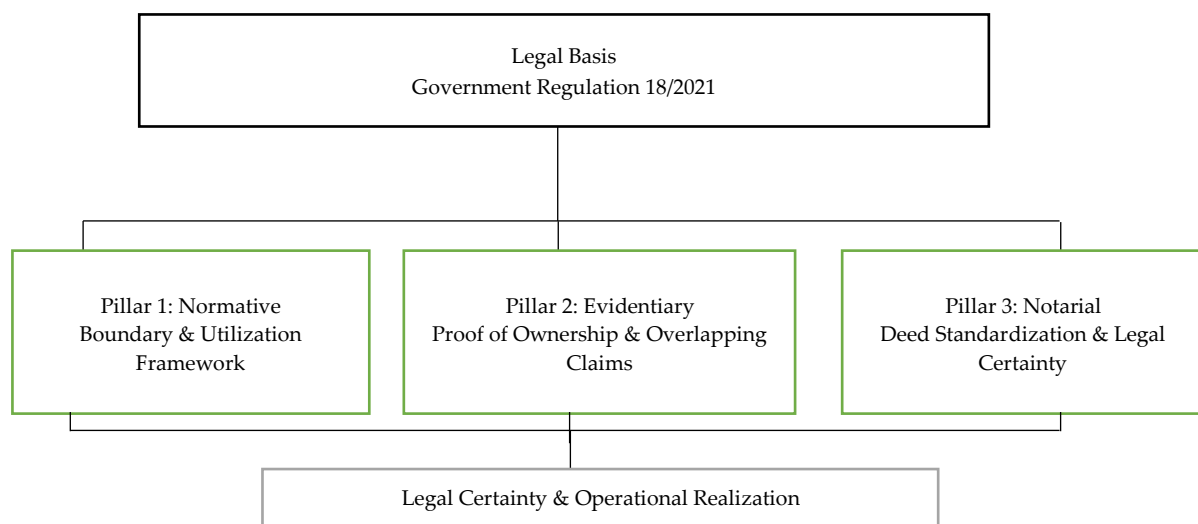
This technology becomes crucial, particularly for projects such as:

- a. Underground Mass Rapid Transit (MRT) and Light Rail Transit (LRT) systems;
- b. Utility tunnels;
- c. Commercial basements;
- d. Underground parking facilities;
- e. Pipeline and energy network installations.

Analytical Framework

The analytical framework is designed around the core paradigm shift introduced by Government Regulation No. 18 of 2021 (GR 18/2021), which formally unbundles traditional surface-bound land rights (*surface ownership*) from three-dimensional space utilization, specifically Underground Space (*Ruang Bawah Tanah - RBT*).

To systematically address your research objectives, the framework is divided into three interconnected analytical dimensions:



Dimension A: Statutory Interpretation of GR 18/2021 (Objective 1)

- a. The Horizontal Division Principle (*Horizontal Splitsing*): Analyzing how GR 18/2021 separates the ownership of the surface land (*tanah permukaan*) from the utilization rights of shallow and deep underground spaces.
- b. Public vs. Private Domain: Differentiating the legal status of *Struktur RBT* (Shallow Underground Space, usually tied to surface rights or regional zoning) and *RBT Dalam* (Deep Underground Space, which falls directly under State Control/*Hak Menguasai Negara*).
- c. Right of Management (*Hak Pengelolaan* - *HPL*): Evaluating the mechanism where the state grants *HPL* over underground space to government entities or state-owned enterprises, which is subsequently granted to third parties via *Hak Guna Bangunan* (*HGB*) or *Hak Pakai* (*HP*).

Normative-Dogmatic Method

This method serves as the baseline to analyze the internal consistency of Indonesian land law. It will be used to answer the question: *Does GR 18/2021 seamlessly integrate with the foundational Agrarian Law (UUPA No. 5/1960), or does it create a structural contradiction?*

- a. Deductive Syllogism: Applying the general statutory provisions of GR 18/2021 (Major Premise) to the specific facts of underground space utilization and registration disputes (Minor Premise) to derive concrete legal conclusions.

Teleological (Purposive) Interpretation

Since underground space regulation is driven by rapid economic growth (Ngabut & Silalahi, 2025; Nirahua et al., 2022), rapid urbanization, and mass transit infrastructure development (e.g., MRT/LRT subways), this method interprets the law based on its intended purpose: maximizing spatial efficiency while preserving public interest and legal security.

Conceptual Approaches (Statutory & Conceptual Approach)

- a. Statutory Approach: Examining the vertical hierarchy of regulations, from the Job Creation Law (*UU Cipta Kerja*), GR 18/2021, down to Ministerial Regulations of ATR/BPN regarding 3D Cadastres.
- b. Conceptual Approach: Building a coherent doctrine of "Volumetric Real Estate" or "3D Property Rights" that does not yet fully exist in traditional Indonesian civil jurisprudence.

Justification of the Approach

Choosing a Normative-Conceptual approach backed by 3D Spatial Legal Analysis is justified by several critical legal factors:

- a. Resolution of a Regulatory Vacuum: Before GR 18/2021, underground utilization relied on ad hoc, surface-level leases that provided no long-term collateral value or banking security. A normative critique is necessary to evaluate if the new regulations actually fix this structural flaw. (Djaja & Ramadhan, 2023)
- b. Preventing Future Litigations: The traditional principle of *accessio* (where the owner of the land owns everything above and below it) is deeply embedded in the Indonesian Civil Code (*Burgerlijk Wetboek*). Because GR 18/2021 disrupts this principle, a conceptual legal study is the only way to establish how a Notary can draft a bulletproof deed that prevents lawsuits between surface landowners and underground developers.
- c. Bridging Law and Geodesy: Land registration is where law meets engineering. Justifying a 3D legal framework is critical because a purely textual legal approach cannot solve modern spatial overlaps; it requires a legal framework that recognizes digital, volumetric data as valid evidence of title ownership. (Samuel T Ariaratnam & Bahaa Chammout, 2021)

3. FINDINGS AND DISCUSSION

The General Overview of the Land Office (BPN) of Palu City

The Land Office (BPN) of Palu City is a vertical agency of the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, with authority to administer land administration in the city. The main functions of this office include land registration, land regulation and management, and the provision of land information services. In the context of underground space management, this office serves as the technical implementer of land object registration in accordance with applicable laws and regulations.

The organizational structure of the Land Office (BPN) of Palu City, in accordance with Minister of Agrarian Affairs and Spatial Planning Regulation Number 17 of 2020 concerning the Organization and Work Procedures of the Regional Office of the National Land Agency and Land Offices, Article 22, consists of the Administrative Subdivision, the Survey and Mapping Section, the Rights Determination and Registration Section, the Land Arrangement and Empowerment Section, the Land Acquisition and Development Section, and the Control and Dispute Resolution Section.⁴²

Regulation of Rights Over Underground Space Under Government Regulation Number 18 Of 2021

Government Regulation Number 18 of 2021, for the first time, specifically regulates rights over underground space. This regulation is important because previously, land rights were only understood as limited to the surface of the earth. With the introduction of this provision, underground space can be separated from the land above it and categorized as a legally valid object of rights.

This regulation also classifies underground space into two categories: shallow and deep. Shallow underground space refers to the space that is held by the holder of rights over surface land up to a depth determined in the local regency or municipal spatial plan. However, in the absence of a spatial plan in the relevant area, the depth attached to the holder of rights over surface land extends up to 30 meters from the ground surface. Meanwhile, deep underground space refers to space that is structurally and functionally separate from the holder of rights over the surface land.

In this regulation, underground space may be granted rights such as Management Rights, Building Use Rights, and Rights of Use. An exception applies where oil, natural gas, minerals, and coal resources are utilized; in such cases, rights over land cannot be granted.⁴³ This means that the utilization of underground space remains subject to the existing agrarian legal system, with the difference lying in the object of the rights. These rights are granted on the condition that they comply with the spatial plan and obtain government approval, as well as the approval of the holder of surface rights if the utilization of underground space interferes with the holder's interests.

The registration of rights over underground space is carried out at the Land Office (BPN). After all requirements are met, a specific certificate will be issued as proof of ownership or control. This certificate provides legal certainty for both the rights holder and other interested parties. In addition, matters such as who may become the holder of the rights (subject), what may serve as the object, the duration of the rights, and the procedures for the transfer or termination of the rights essentially follow the provisions applicable to ordinary land rights.

However, the implementation of this regulation still faces challenges. For example, how to clearly delineate the boundaries of underground space in three dimensions (3D), as well as what form of Notarial deed is appropriate for transactions involving rights over underground space.

Overall, Government Regulation Number 18 of 2021 has provided a strong legal foundation for the independent management of underground space. However, its implementation still requires more detailed implementing regulations, particularly concerning measurement procedures, certificate standards, and integration with spatial planning. With further refinement, rights over underground space can provide legal certainty while supporting more efficient spatial utilization in urban and densely developed regions.

Position of Authentic Deeds by Notaries in the Regulation of Underground Space

The results of the study indicate that Notaries in Palu City still use standard deed formats that only specify horizontal boundaries. In several cases related to the use of underground space, such as utilities or basements, Notaries provide vertical descriptions as additional information. However, due to the absence of a standardized format, the evidentiary strength of such deeds may be subject to varying interpretations at the registration stage. The Land Office (BPN) of Palu City considers it necessary to integrate Notarial deed formats with three-dimensional registration standards to ensure that authentic deeds objectively reflect spatial conditions.

Main Research Findings

Based on the overall results of the field research and normative study, several main findings are identified as follows:

- a. The regulation of underground space is already available at the level of government regulation; however, its implementation has not yet operated optimally.
- b. The Land Office (BPN) of Palu City has faced technical and procedural constraints due to the absence of a three-dimensional land registration system.
- c. Disharmony between land registration regulations and underground space regulations has constituted the main obstacle in achieving legal certainty.
- d. There is a need to refine technical guidelines for mapping and registration to ensure that rights over underground space can be recorded accurately and proven juridically.

New Concept of Underground Space

The concept of underground space is relatively new in Indonesia's land law. Before the enactment of Government Regulation Number 18 of 2021, land rights were understood only as limited to the surface of the earth, without any explanation of the space beneath it. Through this regulation, underground space can be separated from the surface land and designated as an independent object of rights (Rohaini & Jamilah, 2024). This separation is important because the demand for space in urban areas continues to increase, for example, for the development of Mass Rapid Transit (MRT) systems, utility networks, underground parking, and other public facilities. With this regulation in place, the use of underground space can be managed in a more orderly manner and provide legal certainty.

Procedure for the Registration of Rights

For underground space to be utilized legally, every grant of rights must be registered with the Land Office (BPN). The registration process is essentially similar to ordinary land registration, but with certain technical adjustments. The applicant must prepare documents, including proof of title, a spatial utilization permit, technical documents defining the boundaries of the underground space, and an

authentic deed that serves as the basis of the agreement. After the documents are complete and verified, the Land Office (BPN) will conduct measurements and record them in the land administration system. The final result is the issuance of a certificate of rights over underground space as official proof. This certificate serves as the legal basis for the holder of rights to utilize the underground space for its designated use.

Subject and Duration of Rights

Rights over underground space may be granted to legal subjects which, in principle, are the same as those applicable to ordinary land rights, namely:

- a. Individual Indonesian citizens;
- b. Legal entities established under Indonesian law and domiciled in Indonesia;
- c. Government institutions or agencies, in accordance with their respective authorities.

Meanwhile, the duration of rights over underground space follows the type of rights attached to it. For example, Building Use Rights (HGB) may be granted for up to 30 years. They may be extended, while Rights of Use may be granted for the intended purpose, generally ranging from 5 to 25 years, depending on the licensing provisions. This regulation indicates that although the object differs, namely underground space, the principles governing the granting of rights remain based on the applicable national agrarian system.

"While the registration of surface and underground spaces at the Palu City Land Office highlights the systemic risks of overlapping claims, a robust application of Radbruch's theory demands that we look beyond mere procedural clarity to cultivate a 'sound legal certainty'—one that systematically harmonizes strict statutory predictability with the demands of institutional justice and social utility."

In its implementation, the Palu City Land Office (BPN) requires an authentic deed prepared by a Notary as the basis for registration. At this point, the role of the Notary as a gatekeeper of legal certainty becomes evident. The Notary ensures that the submitted deed fulfills both formal and substantive requirements, for example, by specifying the boundaries of underground space in detail, the duration of the rights, and clauses concerning the parties' obligations.

The integration between the theory of legal certainty, the role of the Notary, and the administrative implementation at the Land Office (BPN) of Palu City provides stronger legal assurance. This not only protects the interests of the public and business actors, but also supports the State's duty to manage space in an orderly and equitable manner.

The land administration conditions at the Land Office (BPN) of Palu City concerning underground space, based on the results of interviews and observations, can be summarized as follows:

- a. The registration of underground space has not yet operated optimally because it remains in a transitional stage from a two-dimensional (2D) data management system to the requirements of a three-dimensional (3D) data system;
- b. Technical regulations have not yet provided adequate support, so land administration officers lack standardized guidelines for measuring, mapping, and determining the vertical boundaries of underground space.
- c. Applications for the registration of underground space remain limited and, in practice, have rarely been carried out, with most cases involving utilities and government infrastructure, such as underground cable or pipeline networks. This condition indicates that the implementation of underground space still requires technical readiness and strengthened institutional capacity.

Technical Limitations in Determining the Object of Underground Space

The Land Office (BPN) of Palu City faces several main technical problems, including:

- a. 3D Measurement and Mapping System

At the time this research was conducted, the Land Office (BPN) of Palu City still used two-dimensional (2D) based registration systems and equipment that did not support the accurate recording of vertical boundaries. Presents the following challenges:

- 1) The depiction of underground space in parcel maps cannot represent the depth and volume of space precisely
- 2) Issuing certificates is difficult because the object cannot be fully represented in land documents.
- 3) The comparison between underground space and its position relative to surface land rights becomes inaccurate

- b. Uncertainty of Minimum Depth

The Land Office (BPN) of Palu City does not yet have official guidelines regarding the minimum or maximum depth of underground space that can be registered. Some officers indicated that the interpretation of depth is still determined on a case-by-case basis, creating the potential for inconsistent treatment across applications.

- c. Absence of a 3D Cadastral Map

The absence of a three-dimensional cadastral system results in:

- 1) Space above the land, the surface, and underground space cannot be mapped as separate objects;
- 2) Boundaries between spatial units cannot be determined visually;

- 3) The potential for disputes is difficult to predict, particularly when infrastructure development is located beneath land owned by another party.

Analysis of the Implementation of Legal Certainty at the Land Office (BPN) of Palu City

Based on the field findings, the implementation of legal certainty at the Palu City Land Office (BPN) regarding underground space has not yet operated optimally. The analysis indicates:

- a. The Principle of Clarity Has Not Been Fulfilled

Due to the absence of technical guidelines, the object description in applications for underground space cannot be clearly set out in either the measurement document or the supporting land deeds.

- b. The Principle of Administrative Consistency Remains Weak

Differences in officers' interpretations of registration procedures indicate that consistency in implementation has not yet been achieved.

- c. The Principle of Predictability Is Constrained

Uncertainty regarding technical documents, spatial depth, and the relationship between underground space and surface rights prevents applicants from predicting the outcome of registration applications.

- d. The Principle of Legal Protection Has Not Been Maximized

Inaccuracies in technical data may lead to future conflicts, particularly when infrastructure development intersects with public land.

Role of Notaries in Practice at the Land Office (BPN) of Palu City

From a doctrinal perspective, the traditional Indonesian Land Law, governed by the basic agrarian principles (UUPA / Law No. 5/1960), operates primarily on a horizontal separation principle (asas pemisahan horizontal). This traditionally separated land ownership from the buildings or structures on it. However, the rapidly expanding urban vertical and subsurface landscape—even in areas like Palu City—demands a distinct approach to the vertical dimensions of real property.

The legal landscape shifted with Law No. 6/2023 on Job Creation (UU Cipta Kerja) and its primary executing regulation, Government Regulation No. 18/2021 (PP 18/2021). Under Articles 74 and 75 of PP 18/2021, Underground Space (Ruang Bawah Tanah - RBT) is doctrinally compartmentalized into two categories:

- a. Shallow Underground Space (RBT Dangkal): Up to a maximum depth of 30 meters from the surface, which remains inherently linked to the surface land title holder.
- b. Deep Underground Space (RBT Dalam): Beyond 30 meters, or structurally/functionally separated from the surface. This space can be granted independent land titles such as Right to Build (Hak Guna Bangunan - HGB), Right to Use (Hak Pakai), or Right to Manage (Hak Pengelolaan - HPL).

The primary doctrinal dilemma for Notaries practicing at the Palu City Land Office (BPN) lies in Legal Certainty (Kepastian Hukum) versus Administrative Limits. While the law recognizes RBT as an independent legal object, the local BPN offices often lack detailed 3D cadastre systems or adequate subterranean technical data. Acting under Law No. 2/2014 on Notary Positions (UU JN), Notaries must guarantee the formal and material correctness of a deed while navigating this vacuum.

This analysis identifies a critical legal-technical lag in Indonesia's modernizing land regime. While PP No. 18/2021 introduces a paradigm shift by recognizing 3D subterranean spaces as registrable assets, the state has failed to provide the technical infrastructure (3D mapping standards) to implement it. Furthermore, it highlights a newly emerging professional frontier: the transformation of the notary's role from a 2D document authenticater to a 3D spatial translator.

4. CONCLUSION

Based on the research and analysis conducted, the following conclusions can be drawn.

a. Underground Space Rights (PP No. 18/2021)

PP No. 18 of 2021 modernizes Indonesian agrarian law by officially recognizing 3D space (above and underground) as a registrable legal asset. While this unlocks massive potential for urban infrastructure such as subways and other underground facilities, a major gap remains: the government has yet to issue technical standards for 3D mapping and for measuring these subterranean boundaries.

b. The Hurdle: Proof & Registration

Registering underground rights is technically and legally complex. Because Indonesia's current land registry is built for a 2D world, it struggles to map 3D ownership. Key challenges include:

- 1) Boundary clashes: High risk of overlapping with surface land rights or neighboring underground projects.
- 2) Paperwork gaps: A lack of historical title documents that explicitly define underground boundaries.
- 3) Complex licensing: Strict requirements for vertical/horizontal boundary maps and Spatial Utilization Confirmations (KKKPR) to define allowable depth.

c. The Notary's New Frontier

Notaries are the gatekeepers for these agreements, tasked with turning complex, 3D spatial realities into bulletproof, unambiguous legal deeds. Their ultimate challenge is translating a physical, three-dimensional space into clear, written text that leaves zero room for misinterpretation.

Recommendations

- a. For the Ministry of Agrarian Affairs and Spatial Planning (ATR/BPN): Urgently issue technical regulations establishing standardized 3D cadastre (spatial mapping) protocols, utilizing volumetric measuring techniques to define depth and vertical boundaries legally.
- b. For Notaries and Practitioners: Develop new, standardized clauses in legal deeds that explicitly use precise geometric, depth, and spatial coordinates (rather than traditional surface boundaries) to eliminate ambiguity.
- c. For Developers and Municipalities: Ensure comprehensive Spatial Utilization Confirmations (KKKPR) are secured early in the design phase to clearly map out subterranean limits and prevent overlapping litigation with surface owners.

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