

## The Dynamics of Electronic Land Certificate Issuance in the Era of Industrial Revolution 5.0: An Analysis of Security, Legal Policy, and Administrative Protection

Franciscus Xaverius Wartoyo, Meivina Jayanti, Dewi, Lee Yong Hwa

<sup>1,2,3,4</sup>Universitas Pelita Harapan, Indonesia

Email: [franciscus.wartoyo@uph.edu](mailto:franciscus.wartoyo@uph.edu) (Corresponding Author)

Accepted: 28-11-2025. Revised: 09-12-2025 Approved: 10-12-2025 Published: 12-12-2025

DOI: 10.30596/dll.v11i1.27082

### *How to cite:*

Wartoyo, F X, et al (2026). "The Dynamics of Electronic Land Certificate Issuance in the Era of Industrial Revolution 5.0: An Analysis of Security, Legal Policy, and Administrative Protection", De Lega Lata: Jurnal Ilmu Hukum, Volume 11 (1): p. 108-119

### *Abstract*

*The land sector digital transformation represents a core aspect of Industrial Revolution 5.0 because it requires human-technology collaboration. The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) launched electronic land certificates as a strategic move to enhance public administration efficiency and service transparency and land ownership legal certainty. The new system creates multiple difficulties which affect data protection and legal frameworks and administrative safeguarding of land ownership rights. The research investigates electronic land certificate distribution through state administrative law and community legal protection frameworks. The research design combines normative juridical analysis with evaluations of applicable laws and regulations and doctrinal interpretations and judicial decisions and digital technology integration in land administration. The research findings demonstrate that electronic land certificate distribution through blockchain systems or integrated servers provides reliable and efficient operations yet faces security threats and conflicting rules and user digital competence restrictions. The legal framework requires alignment between Law No. 11 of 2008 about Electronic Information and Transactions and Law No. 5 of 1960 about Basic Agrarian Principles and BPN implementing regulations to validate rights holder protection. The Industrial Revolution 5.0 requires electronic land certificate implementation to include enhanced data protection systems and digital bureaucracy accountability measures and flexible legal oversight that protects community rights through technological advancements.*

**Keywords:** *Electronic Land Certificate, Industry 5.0, Data Security, Legal Policy, Administrative Protection.*

## INTRODUCTION

A land certificate functions as an official document which proves ownership rights to land for people and organizations and receives official government approval. The Indonesian land law framework uses this certificate as proof for court proceedings in both civil cases and land dispute resolutions (B. Harsono, 2008). The existence of certificates creates legal clarity which

supports economic and social stability because land represents a vital resource affecting all human activities.

The National Land Agency (BPN) has launched electronic land certificates (e-certificates) as its current digital innovation for land documentation. The government uses this initiative to advance its digital transformation of land administration systems while building e-government infrastructure. The government uses e-certificates to achieve three main goals which include reducing administrative errors and protecting land data from tampering and enhancing the security of land information. The digital transformation of land certificates brings two-fold benefits to administrative operations through simplified processes and improved transparency and accountability in land management.

The introduction of electronic land certificates has triggered multiple legal and administrative problems which affect the system (Safitri, 2021). The public remains uncertain about how well the e-certificate system protects land ownership rights through its ability to maintain legal certainty while facing potential data breaches and system vulnerabilities and unauthorized data access. The digital transformation of land management faces legal challenges because different stakeholders disagree about how to link agrarian rules with personal data protection standards and whether technology systems at local levels are prepared and if staff members have sufficient skills to operate digital platforms.

The Industrial Revolution 5.0 requires electronic land certificate implementation to achieve technical efficiency while maintaining legal protection and administrative safeguards for community members. The digitalization of land should function as a tool to enhance community empowerment through inclusive agrarian governance instead of becoming a modernization tool that could lead to exploitation.

The research investigates electronic land certificate issuance processes which occur during the Industrial Revolution 5.0 period through complete analysis. The research investigates three essential aspects which include system and data protection measures and legal frameworks and administrative safeguards for land ownership stakeholders. The research employs normative and conceptual juridical methods to create adaptive legal frameworks which protect community rights and maintain legal stability and justice in the national land system.

Information technology has experienced significant development during the last twenty years which transformed all sectors of society. The digital world now hosts all our communication activities and shopping needs and public service delivery. The Indonesian government works to stay ahead of other nations by implementing digital transformation through electronic land certificate issuance under the name e-certificates (Undang-Undang Nomor 5 Tahun 1960 Tentang Peraturan Dasar Pokok-Pokok Agraria Republik Indonesia, 1960).

The government has made electronic land certificates its strategic priority to advance digital transformation in the land sector according to Ministerial Regulation Number 1 of 2021 (Peraturan Menteri ATR/BPN Nomor 1 Tahun 2021 Tentang Sertifikat Elektronik, 2021).

The government has introduced electronic land certificates through Ministerial Regulation Number 1 of 2021 to support digital transformation in the land sector.

The Industrial Revolution 5.0 brings new operational challenges because digitalization creates security risks and system vulnerabilities and legal frameworks that need better adaptation to modern technology.

The digital transformation needs robust administrative legal safeguards to protect people's land ownership rights. The electronic system faces challenges because it lacks complete cyber security measures and proper database integration and insufficient community outreach programs. The legal framework for electronic certificate issuance exists through this regulation which also establishes electronic certificates as legally equivalent to traditional land certificates. The implementation of electronic certificates faces multiple administrative disputes because field records do not match electronic system data which results in land ownership conflicts between parties. The process of issuing electronic certificates follows the guidelines established in Permen ATR/BPN Number 1 of 2021 which the Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency issued.

The implementation of electronic certificates faces technical barriers because different regions lack sufficient technology to achieve optimal results. The public expresses doubts about electronic certificate validity because of security concerns regarding digital data protection. The lack of public education about electronic certificate procedures and rights has created confusion which results in disputes between citizens.

The implementation of digital platforms has brought faster certificate processing to the bureaucratic system which results in increased operational efficiency. Digital certificates provide enhanced security for documents because they exist as permanent digital files which cannot be destroyed and are resistant to both loss and forgery attempts. The national electronic database now manages land data in an organized manner because it includes all relevant information. The proposed advantages match the bureaucratic system of Indonesia through improved operational efficiency.

The implementation of electronic certificates faces multiple obstacles which stem from technical problems and legal issues and social barriers that affect their usage. The implementation of electronic certificates faces multiple technical obstacles because some areas lack sufficient internet access which prevents digital certificate usage. The government agency experienced a data breach which created doubts about the security systems in place.

The legal framework presents multiple obstacles because it enables the creation of double certificates and multiple land ownership which reduces prevention efforts and generates conflict potential. The legal foundation of ATR/BPN Regulation No. 1/2021 remains insufficient according to some experts. The 1960 Basic Agrarian Law and Government Regulation No. 24/1997 lack specific provisions about digital certificates.

The implementation of new regulations will create unavoidable conflicts with existing laws. People from rural areas continue to prefer physical certificates because they believe these documents provide better security despite technological advancements. The digital transformation of documents creates doubts about their authenticity while system failures and social conflicts emerge from community interactions.

Information technology has revolutionized every domain through its development during the previous twenty years. All public services and shopping activities and communication methods have started to shift toward digital platforms. The Indonesian government

demonstrates its commitment to digital transformation through its policy to convert land services into electronic land certificates which they call e-certificates.

The Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency (Permen ATR/BPN) Number 1 of 2021 establishes the rules for e-certificates issuance. The regulation establishes e-certificates as legal documents which hold equal value to traditional land certificates. The implementation of electronic certificates faces multiple administrative disputes because of three main issues which include data errors and discrepancies between electronic records and field documentation. The public remains unaware about electronic certificate procedures and their rights which creates confusion that might result in legal disputes.

The implementation of electronic certificates faces challenges because different areas lack sufficient technological infrastructure.

The elevated risk of electronic data security breaches creates public doubts about the authenticity of electronic certificates.

## **METHOD RESEARCH**

Multiple cases have demonstrated that administrative barriers appear during the process of implementing electronic certificates in real-world situations. The public reports that digital certificate issuance takes longer because of the digital transformation process. The process of obtaining certificate completion estimates proves challenging for Notaries and PPATs when serving their customers. The media has engaged in discussions about the advantages and disadvantages which this policy brings to the public. The supporters of electronic certificates believe they will establish Indonesia as a technology-based public service nation but opponents argue the policy moves too quickly without proper government preparation and public education.

The implementation of electronic land certificates produces two distinct effects which become apparent from the information provided. The system brings advanced technological possibilities but simultaneously generates administrative conflicts between different parties. The research investigates the complete process of electronic land certificate issuance to identify administrative dispute origins and their root causes and develop solutions for regulatory and technical and field-based implementation. The research aims to create an extensive understanding of physical to electronic certificate transition dynamics which will help the land digitization policy fulfill its core goals of legal assurance and land right defense for Indonesian landowners.

## **DISCUSSION**

### **1. Legal Basis for Electronic Certificates in Indonesia**

The Indonesian government bases its electronic land certificate system on multiple laws which include the following:

The UUPA (Law Number 5 of 1960) and its implementing regulations serve as the primary legal foundation for electronic land certificates in Indonesia. The following points explain the detailed implementation of these regulations:

The UU ITE (Electronic Information and Transaction Law) Number 11 of 2008 with its amendments through Law Number 19 of 2016 establishes that electronic documents maintain equal legal value to paper-based documents. The law establishes electronic land certificates as valid proof for legal purposes.

Government Regulation on Land Registration: The Government Regulation (PP) No. 18 of 2021 updates PP No. 24 of 1997 by establishing electronic land registration procedures.

Job Creation Law: The Job Creation Law (Law No. 11 of 2020) requires the implementation of electronic land services.

The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) receives authorization to perform digital transformation through the Job Creation Law (Law No. 11 of 2020).

The ATR/BPN Ministerial Regulation Number 1 of 2021 about Electronic Certificates received revocation through ATR/BPN Ministerial Regulation Number 3 of 2023 which established new rules for electronic document issuance in land registration activities.

The new ATR/BPN Ministerial Regulation demonstrates how the government now approaches land digitalization through different methods. The registration process of Ministerial Regulation Number 1 of 2021 focused on producing the final Electronic Certificate document. The new Ministerial Regulation Number 3 of 2023 extends its coverage to all aspects of land registration digitization starting from initial registration through data upkeep and change documentation and conventional document transfer. The Ministry of ATR/BPN now creates an extensive legal framework which includes all digitalization stages from initial registration to data upkeep and change documentation and conventional document transfer. The digital transition success depends on both final product quality and complete process security and validity. The BPN maintains a strong legal basis to distribute digital certificates through this position.

The current laws of Indonesia establish Electronic Certificates as official documents which serve as powerful evidence during land registration proceedings. The BPN maintains its Electronic Data System Database where these electronic documents become available for evidence collection. The system exists to stop the common practice of physical certificate counterfeiting.

The security features of Electronic Certificates include electronic signatures (TTE) which become part of the document through cryptographic operations. The TTE system generates exclusive authentication codes which protects documents from tampering and ensures their complete integrity thus providing better security than traditional wet signature methods on physical papers. The Electronic Certificate system represents an innovative solution which enhances legal clarity and minimizes the chances of disputes because of document falsification.

## **2. Dynamics of Electronic Land Certificate Implementation in the Industrial Revolution 5.0 Era**

The main factor influencing electronic land certificate deployment involves cybersecurity management. The growing digital transformation has led to a substantial rise in threats against land ownership information. The system faces three main security risks which include hacking attempts and data exposure and digital document modification attacks.

The National Land Agency (BPN) operates an electronic land certificate system which becomes vulnerable to cybercrime because it contains confidential information about owners

and their properties and financial values and all recorded transactions. The previous government data breaches at various agencies demonstrate why organizations need to implement advanced cybersecurity protection systems (B. , & D. R. Harsono, 2022).

The implementation of certified electronic signatures together with international standard encryption systems and role-based access control systems serves as a mitigation strategy. The technical aspects of system security require additional measures which include scheduled cybersecurity assessments and established incident response protocols to protect public interests from data protection weaknesses in the land certificate digitization process.

The process of land digitization needs consistent regulatory frameworks between different laws to prevent legal disputes. The legal framework for electronic land certificates exists across multiple regulations yet these regulations lack complete synchronization. The Basic Agrarian Law of 1960 and Government Regulation No. 24 of 1997 lack specific provisions about electronic certificates yet the Electronic Information and Transactions Law and Minister of Agrarian Affairs and Spatial Planning/National Land Agency Regulation No. 3 of 2023 already recognize digital documents.

Personal data protection received its powerful legal foundation through the enactment of Law No. 27 of 2022 concerning Personal Data Protection (PDP). The law requires electronic certificate data management to follow principles of transparency and security and accountability standards which include data breach notification requirements.

The land sector lacks specific national cybersecurity standards which include Standard Operating Procedures (SOPs) for data security and media transfer guidelines and electronic certificate data backup and recovery protocols. The technological readiness of BPN regional offices determines the field implementation of systems which results in unequal service delivery and possible administrative noncompliance.

State Administrative Law recognizes electronic land certificate issuance as a State Administrative Decision (KTUN) because it produces individualized and final decisions. All administrative actions performed by land officials during certificate digitization need to follow both authority principles and General Principles of Good Governance (AUPB) which include legal certainty and transparency and accountability.

The public maintains the right to file administrative complaints (objections and administrative appeals) when procedural mistakes or authority defects or AUPB violations occur. The State Administrative Court (PTUN) becomes the final option for resolving disputes when administrative complaints fail to produce results.

The successful implementation of electronic land certificates requires both technological preparedness and effective public administration practices. BPN officials need to follow standardized operational procedures which prevent them from making discretionary decisions that break the principle of proportionality or result in *detournement de pouvoir*.

#### Socialization and Community Participation in Land Digital Transformation

Socialization and community participation represent essential elements for the success of land digital transformation. People living in rural areas lack understanding about electronic land certificate operations and document conversion procedures and digital certificate verification methods and error complaint processes.

The absence of socialization efforts has created public skepticism about electronic certificates because most people view physical documents as more secure and tangible. The digital system which stores electronic certificates provides enhanced security through automatic backup systems and authentication verification processes.

The ATR/BPN needs to adopt an adaptive communication strategy for public outreach through digital literacy programs at land offices and village/subdistrict locations and mobile services for areas with restricted internet access. The system provides basic instructions about electronic certificate usage and users can find information about reporting data errors. The transition process requires village officials and notaries/PPAT to help the community through their assistance.

The success of land digitalization depends heavily on community participation as its fundamental component. The electronic land certificate program faces potential resistance and administrative disputes because of insufficient public support during its implementation.

### **3. Administrative Disputes in Certificate Issuance**

The transition to electronic certificates does not resolve existing land-related disputes which already exist. The process of electronic certificate adoption has not resolved the existing problems which include double certificates and rights conflicts and administrative legal issues. The following section describes different types of disputes together with their primary causes.

The land sector faces a frequent issue with duplicate certificates that result from measurement mistakes and field research mistakes and fake ownership documents and missing accurate land registration maps. The system provides protection against document tampering but basic data errors can still generate rights conflicts.

#### **Legal Protection and Legal Action through the State Administrative Court**

The Indonesian legal system operates through two separate judicial pathways which include the General Court (Civil) and the State Administrative Court (PTUN). The General Court handles civil cases about land ownership disputes through its authority to make final decisions that can result in certificate cancellation. The PTUN handles public harm cases that stem from government official decisions including Head of Land Office certificate issuance decisions.

The General Court handles civil disputes about land ownership through lawsuits that focus on ownership rights between individuals and legal entities. The Administrative Court receives cases that challenge certificate issuance decisions when these decisions contain administrative or legal errors. The Administrative Court has the power to invalidate or reverse certificate issuance decisions which contain administrative or legal errors that trigger disputes.

### **4. Case Study Analysis: Ambon Administrative Court Decision Regarding Farida Kh.M.A Saifuddin's Certificate Cancellation of the certificate due to administrative and legal defects**

The Administrative Court demonstrated its role in land disputes through its decision about a 580 square meter land dispute which Farida Kh.M.A Saifuddin filed in Gufasa Village of West Halmahera. The Ambon Administrative Court judges made a decision about this case which demonstrates their process for evaluating BPN-issued title certificates (Jurnalone, 2025).

The Ambon Administrative Court invalidated Title Certificate Number 00416/Gufasa which BPN issued on December 20, 2022. The court based its decision to revoke the title on multiple administrative and legal errors that occurred during the certificate issuance process. The Panel of Judges based their decision on Article 66 (1) of Law Number 30 of 2014 and Article 29 (1) of Minister of Agrarian Affairs and Spatial Planning/National Land Agency Regulation Number 21 of 2020. The court demonstrates its power to cancel BPN administrative choices when these choices violate existing laws and regulations.

#### **5. The State Administrative Court provides legal protection to the community through its legal remedies which safeguard the community**

The Indonesian land registration system operates through a negative publication system which shows positive developments. The government-issued certificates from the Head of the Land Office hold strong validity but their absolute validity remains subject to legal defect proof. The Administrative Court (PTUN) functions as a vital mechanism which enables the correction of adverse administrative choices.

#### **6. PTUN Authority and Functional Responsibilities**

The PTUN functions as a judicial body which handles disputes that stem from Administrative Decisions (KTUN). The PTUN accepts land-related KTUN decisions which stem from Administrative Agency or Official actions at the Head of the Land Office level regarding certificate issuance or rejection or cancellation. The PTUN functions as the ultimate authority which protects digital policies from illegal government actions. The National Land Agency (BPN) faces its final appeal through the PTUN when it makes administrative mistakes during certificate issuance or when it violates established regulations.

#### **7. Steps to File a Lawsuit at the PTUN**

The PTUN lawsuit filing process follows the guidelines established in Law Number 5 of 1986 and its subsequent modifications. The PTUN operates an electronic court system through its e-Court and e-Litigation programs to support modern judicial practices. The electronic court system enables users to initiate cases and submit documents and payment of fees and virtual attendance at hearings. The e-Court system delivers fast and user-friendly services yet users encounter multiple operational difficulties. The digital court system creates a potential digital gap because users without proper internet access or digital skills will struggle to obtain legal services. The advancement of legal systems requires equal justice access for all people through awareness programs and sufficient infrastructure development.

#### **Conclusion**

The Indonesian government has made significant progress through electronic land certificate implementation to create modern land management systems which operate with transparency and efficiency. The industrial revolution 5.0 requires the government to handle two essential elements which include technological advancement and legal framework protection.

The electronic land system faces security risks because hackers could access the system and steal sensitive information. The government needs to establish enhanced digital security

protocols which include improved firewall systems and encryption methods and scheduled security checks and zero trust system integration.

The legal framework and regulatory framework needs to achieve complete alignment between new and existing laws which include the 1960 Basic Agrarian Law and Government Regulation No. 24 of 1997 and ATR/BPN Ministerial Regulation No. 3 of 2023. The government needs to achieve complete regulatory alignment because it will create a conflict-free environment for electronic land certificate implementation while providing legal stability to community members.

State Administrative Law requires officials to follow the principles of authority and procedure and legal substance when they perform digitization tasks for land certificates. The failure to follow good governance principles (AUPB) creates opportunities for administrative disputes to arise through administrative procedures or State Administrative Court (PTUN) litigation.

## REFERENCES

- Harsono, B. (2008). *Hukum Agraria Indonesia: Sejarah Pembentukan Undang-Undang Pokok Agraria, Isi, dan Pelaksanaannya*. Djambatan.
- Harsono, B. , & D. R. (2022). Keamanan siber dalam sertifikat tanah elektronik di Indonesia. . *Jurnal Hukum Dan Teknologi*, 14(2).
- Jurnalone. (2025). *Putusan PTUN Ambon batalkan sertifikat tanah Farida Kh. M. A. Saifuddin*.
- Peraturan Menteri ATR/BPN Nomor 1 Tahun 2021 Tentang Sertifikat Elektronik (2021).
- Safitri, R. (2021). Kepastian hukum dalam penerapan sertifikat tanah elektronik di Indonesia. *Jurnal RechtsVinding*, 10(1).
- Undang-Undang Nomor 5 Tahun 1960 Tentang Peraturan Dasar Pokok-Pokok Agraria Republik Indonesia (1960).