TABELLIUS Journal of Law
ISSN 2988-6201
published by
Master of Notarial Law
Faculty of Law
Universitas Islam Sultan Agung
Semarang

Problems in Implementing Electronic Land Registration At the Pekalongan Regency Land Office

Agung Setya Bakti[1)], Setyawati[2)] & Andri Winjaya Laksana[3)]
[1)]Faculty of Law, Universitas Islam Sultan Agung (UNISSULA) Semarang, Indonesia, E-mail: agungsetyabakti.std@unissula.ac.id
[2)]Faculty of Law, Universitas Islam Sultan Agung (UNISSULA) Semarang, Indonesia, E-mail: setyawati@unissula.ac.id
[3)]Faculty of Law, Universitas Islam Sultan Agung (UNISSULA) Semarang, Indonesia, E-mail: andri.w@unissula.ac.id

Abstract. *This research aims toThis study aims to determine and analyze the implementation, obstacles, and solutions for electronic land registration at the Pekalongan Regency Land Office. This study uses a sociological legal approach. Primary data collection involved interviews, literature studies, and documentation studies. Data analysis was conducted using a qualitative descriptive approach. Based on this study, it was concluded that the implementation of electronic land registration at the Pekalongan Regency Land Office iscan provide many benefits to the community, including minimizing fraud, minimizing brokers/land mafia, preventing corruption, preventing double certificates, saving costs, preventing disputes, conflicts and land cases, minimizing physical meetings, and reducing intervention by unauthorized parties. The implementation of electronic land services can be done through the Sentuh Tanahku application. The result of the implementation of electronic land registration is an electronic certificate. Electronic certificates are legally valid for use as evidence and can provide legal certainty because they are guaranteed by statutory regulations, namelyRegulation of the Minister of ATR/BPN No. 3 of 2023and Law Number 19 of 2016 Amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions. Obstacles and solutions faced in implementing electronic land registration at the Pekalongan Regency Land Officenamely the limited public understanding of electronic certificates, the lack of completeness of land registration application files, the Human Resources (HR) implementers who are still very limited and not ready to implement electronic land registration, the problem of an uneven internet network, and the implementation of land mapping that is not evenly distributed. Solutions that can be implemented to overcome these obstacles are through information dissemination activities or socialization to the community, conducting training or training and workshops for BPN and PPAT*

employees, collaborating with internet providers in order to equalize the network, accelerating updates and security of the land system and improving the Sentuh Tanahku application and strengthening security so that it is not easily hacked by irresponsible parties. In addition to these obstacles there are still problems in electronic land registration, namely the legal aspects and legal umbrella related to the legal force of certificates caused by technical regulations and concerns about data and cyber security.

Keywords: *Electronics; Land Registration; Problems.*

1. Introduction

Land has a very crucial position for human life, especially for Indonesian society which is an agrarian society, land is the main factor for the lives of Indonesian citizens, both for production purposes and housing needs.[1] The importance of land's status gives it high economic value. This high economic value makes land ownership certificates, which are proof of ownership, extremely important. With the rapid development of technology and the advancement of increasingly sophisticated digital technology, the idea of digitizing certificates as proof of land rights has emerged. Previously, land certificates were conventionally created on paper and arranged in a book. These book-like certificates are highly vulnerable to various security risks for their owners. These security risks include theft, fire, loss, damage, and even forgery by irresponsible parties, which can harm the landowner as stated on the certificate. The various risks associated with conventional certificates have prompted the Ministry of ATR/BPN to adapt certificate issuance to current technological developments, prioritizing security and convenience for certificate users and related parties, such as the government. Therefore, the government, through the Ministry of ATR/BPN, is digitizing certificates by streamlining files into digital documents. Certificate digitization has actually been envisioned in Government Regulation Number 24 of 1997 concerning Land Registration. Article 45 provides the view that ultimately, land registration activities will utilize an electronic system, the implementation of which will be carried out in stages, as the process will require significant preparation of personnel, equipment, and costs.

The implementation of electronic land registration has also been emphasized in the provisions of Article 84 paragraph (1) of Government Regulation Number 24 of 1997 concerning Land Registration which states that "The implementation and implementation of land registration can be carried out electronically". Likewise, regarding this matter, an explanation has also been provided in the provisions of Article 35 paragraph (5) of Government Regulation Number 24 of 1997 concerning Land Registration which states that "Gradually, each land registration data is stored and presented through the use of electronic equipment and microfilm". The government has implemented the idea of electronic land registration through Minister of ATR/BPN Regulation Number 1 of 2021 concerning Electronic Certificates. This regulation implements the idea of issuing electronic land certificates (e-certificates).[2]The issuance of the regulation is intended to modernize the land system to improve indicators of ease of doing business and quality of service for the community, through maximum utilization of electronic-based information and communication technology.[3]

[1]Anggi Roy Darmadi, Sulistio Adiwinarto. (2025). “Legal Aspects of Physical Control of Land Plots as a Basis for Issuing Land Ownership Rights in the Complete Systematic Land Registration Program (PTSL) Reviewed Based on the Principle of Legal Certainty” in Indonesian Journal of Law and Justice

Volume: 3, Number 1, 2025, p. 2. url:https://journal.pubmedia.id/index.php/lawjustice/article/view/4655/3975 (Accessed February 7, 2026).

[2]M. Nafan, (2022), "Legal Certainty Regarding the Implementation of Electronic Certificates as Evidence of Land Rights Control in Indonesia", in Tambusai Education Journal, Vol. 6, No. 1, pp. 3342–3355 (Accessed date)

[3]AMI Rachman & ED. Hastri, (2021), "Analysis of Constraints in the Implementation of Regulation of the Minister of ATR / Head of BPN Number 1 of 2021 Concerning Electronic Certificates", in Mulawarman Law Review, Vol. 6, No. 2, pp. 91–104. url:https://e-journal.fh.unmul.ac.id/index.php/mulrev/article/view/646/227. (Accessed February 7, 2026).

In subsequent developments, the Government issued Ministerial Regulation of ATR/KBPN Number 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activities. This regulation revokes the previous regulation, namely Ministerial Regulation of ATR/KBPN Number 1 of 2021. The consideration of issuing Ministerial Regulation of ATR/KBPN Number 3 of 2023 is considered to be more in line with the Vision and Mission of the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency, which aims to create a world-class institution and improve the quality of service to the public, as well as provide data protection and security. The introduction of the electronic certificate policy has undoubtedly sparked various discussions and sparked controversy within the community. There are differing views and opinions regarding the implementation of electronic certificates. Some agree with and accept this policy, which they consider a form of modernization of land services, with the hope that it will provide security, legal certainty, and legal protection for land rights holders. However, this policy has also generated opposing responses from the public. Those who have expressed these opinions believe that the implementation of electronic certificates is a hasty policy and lacks adequate support and preparation. This is seen as potentially creating a state of insecurity in land registration data and, ultimately, uncertainty over land rights.

Many people still believe that electronic certificates are not an urgent need at this time. This perception and view is due to the continued prevalence of land issues in society, such as land disputes due to forged or overlapping certificates. They believe that land registration throughout Indonesia is an urgent need that must be a top priority. In reality, the implementation of electronic land registration at land offices still faces various obstacles and constraints, such as the readiness of human resources, facilities and infrastructure, inadequate or uneven outreach, validation of land plot data, and problems with harmonization and synchronization of laws and regulations. Based on the description above, it appears that electronic land registration is a government policy in an effort to realize excellent service in the land sector to create security, protection, and legal certainty of land registration. Therefore, the author intends to conduct an analysis of electronic land registration by taking the research location at the Pekalongan Regency Land Office. The title of the research is: Problems in the Implementation of Electronic Land Registration at the Pekalongan Regency Land Office. This research aims toto know and analyze the implementation, obstacles and solutions for electronic land registration at the Pekalongan Regency Land Office.

2. Research Methods

This research uses a sociological-juridical approach with qualitative research specifications. Primary data collection involved interviews, literature review, and documentation studies. Data analysis was conducted using descriptive qualitative methods.

3. Results and Discussion

3.1. Implementation of Electronic Land Registration at the Pekalongan Regency Land Office

The Pekalongan Regency Land Office has several duties, including providing administrative services, preparing activity evaluation materials, and drafting programs and regulations. In carrying out its duties, in accordance with Article 4 of Presidential Regulation of the Republic of Indonesia Number 177 of 2024 concerning the National Land Agency, the Pekalongan Regency Land Office has the duty to carry out government duties in the land sector in accordance with the provisions of the law. The BPN carries out the following functions:

1) Preparation and determination of policies in the land sector;

2) Formulation and implementation of policies in the field of land surveying and mapping;

3) Formulation and implementation of policies in the field of land rights determination and registration;

4) Formulation and implementation of policies in the field of land redistribution, community land empowerment, land use, land management according to spatial planning, and management of coastal areas, small islands, borders and certain areas;

5) Formulation and implementation of policies in the field of land acquisition and land development;

6) Formulation and implementation of policies in the field of controlling and regulating land ownership and control, as well as land use and utilization in accordance with spatial planning;

7) Formulation and implementation of policies in the field of handling and preventing, resolving and resolving conflicts and handling land cases;

8) Supervision of the implementation of duties within the BPN environment;

9) Implementation of task coordination, training, and provision of administrative support to all organizational units within the BPN environment;

10) Implementation of data and information management on land and sustainable food agricultural land; and

11) Implementation of human resource development in the land sector.

Like most other regions, Pekalongan Regency still has a significant amount of unregistered land. Therefore, the Pekalongan Regency Government is continuously promoting land registration among the public. The Pekalongan Regency Land Office is also conducting land registration outreach to the public. Furthermore, with the introduction of the electronic land registration policy, public awareness campaigns are being intensified.

Electronic land registration is carried out by the Pekalongan Regency Land Office based on the Regulation of the Minister of ATR/BPN No. 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activities. The transition to an electronic land registration system in accordance with the Regulation of the Minister of ATR/BPN No. 3 of 2023 not only increases efficiency but also strengthens the principles and objectives of existing land registration, as well as adding new elements relevant to technological developments and current community needs.

The implementation of electronic land registration services in Pekalongan Regency can be carried out for applicants through access using the Sentuh Tanahku application which can be obtained by downloading the PlayStore application for applicants using Android cellphones and downloading it via the AppStore application for applicants using iOS cellphones.[4]There are several steps that must be taken to access the Sentuh Tanahku application, namely with several stages.

The first step to accessing land services through the Sentuh Tanahku app is to download it from the App Store or Play Store using your mobile device. The second step is to activate your account using the Gmail account registered by the account holder. The email address is sent under the name of the Ministry of ATR/BPN.

The third stage is to verify the account by uploading a Resident Identity Card (KTP) and taking a direct facial photo with a clear or blurry image. The account verification process is carried out by the relevant Land Office of the domicile. In the fourth stage, for users of the Sentuh Tanahku Application account who have received verification or have been verified by the Land Office, the Service Information Feature will appear. One of the menus in the Service Information Feature is that the application user will be shown the requirements, costs, and duration of the service that must be carried out by the applicant or application user.

In the fifth stage, users of the Touch My Land Application who are applicants can access the Loketku feature to select the required land services and select the desired relevant land office and upload all required land service files online.

[4]Interview with Setya Prayoga, Head of the Rights Determination and Registration Section of the Pekalongan Regency Land Office, November 17, 2025

In the sixth stage, the application user or land registration service applicant goes directly to the relevant selected Land Office to validate the previously uploaded files. The validation process will be carried out by the Registration Counter Officer at the relevant Land Office. The Registration Officer carries out the verification process by uploading the land registration applicant's data according to the uploaded files to KKP 2 (Land Office Computerization 2) so that it is entered or recorded in the big data of the Data and Information Center (Pusdatin) of the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency.

In the seventh stage, land registration applicants can use the Search feature to find out how far along the land registration service file is. In the eighth stage, land registration applicants can retrieve the service results if a notification appears in the Sentuh Tanahku application stating that the file processing has been completed.

The procedures that must be followed in order to register land in order to obtain an electronic certificate are divided into 3 (three) parts, namely the initial creation of an electronic certificate, the issuance of an electronic certificate in the form of a media transfer application and the issuance of an electronic certificate for land data maintenance services.[5]

The process of implementing land registration in order to obtain an Electronic Certificate which begins with the issuance of an Electronic Certificate for land that has not been registered or land that has not been registered or in this case land registration for the first time, the issuance of an Electronic Certificate with a media transfer application or the issuance of an Electronic Certificate for land data maintenance services in Pekalongan Regency in accordance with Government Regulation Number 24 of 1997 concerning Land Registration and for the purpose of land registration in order to obtain an Electronic Land Certificate, it is mandatory to be guided byRegulation of the Minister of ATR/KBPN Number 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activities.

Electronic land registration is part of an effort to ensure orderly land administration. Orderly land administration must be implemented as part of an effort to achieve an aspect of the principle of certainty, especially the principle of legal certainty. Land registration regulations have been laid down as a foundation for the implementation of further tasks, including the authority of the Government to undertake various efforts to obtain as much registered land as possible in Indonesia to realize orderly land on a national scale. In this regard, the Community Rights Holders must have a high awareness to carry out land registration under their authority based on the provisions that have been enacted,

[5]Interview with Setya Prayoga, Head of the Rights Determination and Registration Section of the Pekalongan Regency Land Office, November 17, 2025

namely the Basic Agrarian Principles Regulations (UUPA). Related to the orderly land administration in question, it is in line with the provisions of Article 19 of the Basic Agrarian Principles Regulations (UUPA) which provides regulations on subjective legal certainty, namely regulations regarding legal subjects of legal entities and legal subjects of individuals as parties holding land rights (subjective requirements) and also related to objective certainty, namely certainty regarding the object in the form of land boundaries, length, location to width that they control.[6]Administrative order in the defense sector is one element of efforts to obtain legality based on the principle of certainty, especially legal certainty.

Orderly land administration guarantees legal certainty, given the certainty of both the subject and the object of the land through land registration. Furthermore, the guarantee of legal certainty regarding land rights itself is regulated in Article 3 of Government Regulation Number 24 of 1997 concerning Land Registration, which explains the purpose of land registration, namely:

1) To provide legal certainty and protection to the rights holders of a plot of land, apartment units and other registered rights, so that they can easily prove that they are the rights holders in question;

2) To provide data and information for interested parties, including the government, in order to make it easier to obtain the data needed to carry out legal actions regarding registered land plots and apartment units; and

3) To realize orderly land administration.[7]

Electronic land registration, which aims to ensure orderly land administration, will contribute to legal certainty. This is because legal certainty in the administrative sector requires accountable and responsible administrative management.

Based on the theory of legal certainty, the application of my land touch used in the electronic land registration process can also realize the legal certainty desired by the community. The realization of certainty of services provided by the My Land Touch Application, the results of land services including certificates and files inputted in the My Land Touch Application can be accessed online, which results in an increase in the guarantee of the original certificate connected or connected to the land data available at the Center for Land Data and Information and Sustainable Food Agriculture Land (Pusdatin) of the Ministry of ATR/BPN. Based on this, public services can be upheld that provide services through an orientation

[6]Irwan Soerodjo. (2003). Legal Certainty of Land Rights in Indonesia, Surabaya: Arloka, p. 78
[7]Muhammad Ilham Arisaputra, et al. (2017), "Accountability of Land Administration in Issuing Certificates", in Jurnal Mimbar Hukum, Volume 29, Number 2, June 2017, p. 277 url: https://www.neliti.com/publications/196503/akuntabilitas-administrasi-pertanahan-dalam-penerbitan-sertifikat. (Accessed February 7, 2026)

towards honesty and appropriate resource management, and can be accounted for to the public.[8]

Based on the theory of legal certainty, electronic certificates can provide legal certainty, as they can be used as evidence in court. Certificates serve as a powerful means of proof, and the purpose of land registration is to provide legal certainty in the land sector and ensure orderly land administration, which can be realized and provide benefits both for the public and the government in particular.[9]The evidentiary power of an Electronic Certificate is based on Article 1 number 9Regulation of the Minister of ATR/KBPN Number 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activitiesan explanation is given regarding electronic certificates, namely certificates whose issuance is carried out through an electronic system in the form of electronic documents whose Physical Data and Legal Data have been stored in BT-e. In relation to the strength of electronic certificates, a similar explanation is also provided by Law Number 11 of 2008 concerning Electronic Information and Transactions which can be found in Article 5 paragraph (2), namely valid proof of ownership based on the provisions of valid procedural law in Indonesia.

An electronic certificate, based on its form, can be considered an authentic deed due to the electronic signature. An electronic signature, or digital signature, is a substitute for a manual signature. It is electronic in nature and functions similarly to a manual signature. An electronic signature is a series of bits created through electronic communication in the land sector, specifically for the National Land Agency.[10]

Based on the provisions of Law Number 19 of 2016. Amendments to Law Number 11 of 2008 concerning ITE, what is called an electronic signature is a signature that includes electronic information that is attached, associated or related to other electronic information that is used as a verification and authentication tool. What is meant by associated is that the electronic information that is to be signed becomes data for creating an electronic signature, which causes the electronic

[8]Yola Amanda Putri, et al. (2022). "Innovation in Information Services through the Touch My Land Application at the North Jakarta City Land Office," in Journal of Social and Policy Issues, Volume 2 Number 2 (2022) April-June, p. 87 url:https://journal.pencerah.org/index.php/jspi/article/view/45/37. (Accessed February 7, 2026)

[9]Wida Wirdaniati, et al., "Land Certification Legalization Model in Rural Areas and Projections on the Benefit Value of Ownership", in Unissula Law Journal, Volume 38 No. 2, August, p. 124, url:https://www.researchgate.net/publication/362735303_Model_Legalization_of_Land_Certification_in_Rural_Villages_and_Projections_of_Ownership_Benefit_Value, (Accessed February 7, 2026).

[10]Arif Rahman, Muammar. (2021). "Electronic Certificate Issuance Procedure as Authentic Evidence of Land Ownership," in Juridica: Journal of the Faculty of Law, Gunung Rinjani University, Volume 3, Number 1, November 2021, p. 26 url:https://juridica.ugr.ac.id/index.php/juridica/article/download/191/147/721 (Accessed February 7, 2026)

signature and the electronic information that is signed to be closely related, containing the same meaning as the function of paper.

From a utility perspective, modernization of the electronic land registration process is expected to benefit society. Electronic land registration is a breakthrough that leverages advances in science and technology, particularly information technology, through the use of the internet. It is hoped that this will bring benefits to the community's prosperity. Legal certainty is one of the benefits gained from electronic land registration. The benefits of land registration itself are intended to realize the very purpose of land registration.

Based on the above explanation, it can be concluded that the transition of land registration services from manual to electronic land registration in Pekalongan Regency can create legal certainty and legal protection for land rights owners because it provides many benefits and advantages for service recipients or the community, including avoiding fraud, suppressing the emergence of brokers / land mafia, preventing the emergence of corrupt practices, preventing the emergence of double certificates, saving costs, preventing the vulnerability of land disputes, preventing the emergence of land conflicts and cases, avoiding physical contact, and minimizing the emergence of intervention by parties who have no interest in land registration. The implementation of electronic land services can be carried out with the Touch My Land application. The results achieved from the implementation of electronic land registration are the issuance of electronic certificates. Electronic certificates according to applicable legal provisions are valid for use as evidence and can realize legal certainty due to the guarantees provided by the Laws and Regulations, namelyRegulation of the Minister of ATR/KBPN Number 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activitiesand Law Number 19 of 2016. Amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions.

3.2. Obstacles and solutions faced in implementing electronic land registration at the Pekalongan Regency Land Office

The implementation of electronic land registration in Pekalongan Regency still faces several obstacles, including the public's low understanding of electronic certificates. TransformationElectronic land registration, which was previously carried out manually, cannot be separated from the existence of the community as users of land registration services, where the legal provisions are enforced, causing the understanding and conditions of the community to be one of the important things that must receive attention with the implementation of electronic certificates. Indonesian society does not yet fully understand the technology and procedures for issuing electronic certificates. The process of issuing and using electronic certificates needs to be understood by the entire community, as well as the community's readiness to accept electronic certificates.

Especially in Pekalongan Regency, in general, the community is not yet aware of the existence of electronic certificates. For those who do know and understand the existence of electronic certificates, they think that the procedure for implementing electronic land registration is considered complicated and convoluted. This condition is exacerbated by the large number of people who still have minimal knowledge of technology, in addition not all people have smartphones, this has caused the community to respond that electronic land registration is seen as more difficult and requires a lot of money.[11]

Another obstacle is the public's lack of awareness regarding the importance of data collection in the land certificate issuance process, which leads to a tendency to overlook the required documentation for land registration applications. Beyond this lack of awareness, another obstacle is the lack of evidence of land ownership, necessitating statements and testimonies proving ownership.

Besides thatkLimited human resource (HR) readiness for land registration, as well as the lack of integrated equipment and data at the Land Office, also hinder the implementation of electronic land registration. Furthermore, internet network limitations, particularly those that are not evenly distributed across regions, are still encountered, particularly in remote areas where internet access is still lacking. Furthermore, the persistence of land that has not been mapped and registered makes it difficult to record land that will be registered electronically.

Obstacles in the use of the Touch My Land Application at the Land Office are due to the lack of the "jemput bola" method in the application, but still using social media which is a supporter in the public testing phase of the Touch My Land Application. In the use of the Touch My Land Application Innovation, complications are still encountered in the use of the Touch My Land Application for the Community. The complications in question are related to accessing the Loketku Feature in the context of land services for the first time through submitting files to the Land Office. The complexity of Loketku access experienced by the Community is related to the stopping of the filing process and problems entering or logging in to operate the Loketku Feature.[12]Other constraints,Registration Counter officers at the Land Office also experienced difficulties in operating the Loketku feature on the Sentuh Tanahku application, namely due to limited characters to fill in the message column that must be conveyed to land registration applicants to convey messages regarding missing files that must be completed, which means that to convey the message, officers must convey the message by telephone by speaking directly with the applicant.

[11]Interview with Setya Prayoga, Head of the Rights Determination and Registration Section of the Pekalongan Regency Land Office, November 17, 2025.
[12]Interview with Setya Prayoga, Head of the Rights Determination and Registration Section of the Pekalongan Regency Land Office, November 17, 2025

The Land Office cannot resolve these obstacles hastily or hastily, as this will only complicate the problem, as it is related to the community's understanding and conditions, as well as their knowledge and readiness to accept new technology. Therefore, resolving these obstacles must be done slowly and in stages. Efforts to overcome these obstacles include outreach, introducing the meaning of digitalization, providing outreach related to the uses, benefits, and functions of e-certificates, and providing detailed learning or education on how to use digitalized electronic land certificates. Outreach is conducted for all groups, from those from modern communities to those in rural or remote areas. It is hoped that all members of the public will understand the importance of land registration and that electronic land registration provides convenience and savings in terms of costs.

To address the limited availability of land ownership certificates, a certificate from the local village head can be issued, which can serve as strong evidence of incomplete ownership documents. Furthermore, training and workshops are being provided for Land Office staff and Land Deed Officials (PPAT). Collaborating with internet providers to provide assistance with equal internet network services across all regions is being carried out to facilitate internet access, ensuring smooth electronic land registration.

To address the ongoing issue of land that has not been mapped and registered, land data updates are being accelerated. Additionally, improvements are being made to the "Touch Tanahku" application and security measures are being strengthened to prevent hacking by unauthorized parties.

Apart from the obstacles mentioned above, there are still problems in electronic land registration, namely problems related to aLegal aspects and legal framework. It can be stated that electronic land registration is a government policy oriented towards technological advancements, particularly digital technology and the internet. Electronic land registration will also produce electronic land certificates. Of course, the issuance of these electronic land certificates must have at least the same legal force as the previous manual land certificates. In reality, the issuance of electronic land certificates raises doubts about the legal force of their certificates due to technical regulations (such as Regulation of the Minister of Agrarian Affairs and Spatial Planning/National Land Agency Number 1 of 2021), which many consider inconsistent with similar higher-level laws and regulations, namely Law Number 5 of 1960 concerning Basic Agrarian Principles and Government Regulation Number 24 of 1997 concerning Land Registration.

Apart from these issues, data and cyber security issues are always a concern in electronic land registration.One of the challenges in the digital and internet world is data and cyber security. This issue is also a concern in the implementation of electronic land registration. In electronic land registration, there are concerns

about the possibility of hacking, data loss, or misuse of personal data stored on data servers (cryptographic systems). This issue is a serious matter that requires attention. Furthermore, land issues are highly sensitive and easily give rise to problems or disputes. Vulnerabilities in data and cyber security will further increase the risk of land disputes in the field. This is because land has high economic value, so some parties often exploit loopholes to carry out actions that benefit themselves at the expense of others through manipulation or hacking of electronic data related to electronic land certificates.

Advances in information technology, including the internet, are driving digitalization in all aspects of business. Digitalization has penetrated all business lines as an effort to increase efficiency, making it an urgent necessity in key sectors, including the land sector, which plays a crucial role in national development. The Indonesian government, through the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN), is increasingly encouraged to utilize technology in its public services. One such aspect is the implementation of electronic certificates (e-certificates) in land management and administration processes. This step is taken to increase efficiency, security, and transparency in land transactions, as well as to minimize the potential for document forgery and land disputes.[13]

From the perspective of providing evidence for landowners, certificates are a powerful means of proof. This is because certificates are issued by the state through a state agency called the Ministry of ATR/BPN. The state is authorized by law to organize various matters in the land sector, including land ownership. The state, as an institution with legal standing, provides legal guarantees to land rights owners through certificates. Based on this, the law provides protection for the party holding the certificate, and such protection is stronger if the certificate holder is the name listed on the certificate. E-certificates serve as proof of land ownership, issued in the form of electronic documents using an electronic system. This policy aims to improve services in the land sector to provide certainty and legal protection for landowners, minimize the emergence of land disputes, and prevent land mafia practices. The use of e-certificates in land registration services is an innovative step taken as an effort to expand the role of public services.

Based on this, it can be said that the implementation of electronic land registration serves a public service function, namely, to provide excellent public service. This excellent public service relates to the benefits derived from said service. Public service in electronic land registration offers many benefits, one of the main ones being the guaranteed legal protection for land rights owners.

[13]Salma Marjoni, et al. (2025) "Electronic Land Registration at the Padang City Land Office", in Sibatik Journal, Volume 4 No. 11 (2025), p. 4123. url :https://publish.ojs-indonesia.com/index.php/SIBATIK/article/view/3741/1524(Accessed February 7, 2026).

The government has conducted various monitoring and evaluations of the implementation of electronic land registration. The monitoring and evaluation aims to determine the effectiveness of electronic land registration. Based on the evaluation of the results of the electronic land registration trial by switching from electronic certificates to conventional land certificates, which was previously implemented by the government as stipulated in the Regulation of the Minister of ATR/BPN No. 3 of 2023, important findings were revealed regarding the effectiveness, challenges, and impacts of the system's implementation. The trial aimed to simplify the land administration process. The results showed that electronic land registration could reduce procedures. This reduction in procedures is evident in the aspect of document completeness, namely, that previously required numerous physical documents to be completed, becoming simpler and more concise, or requiring fewer physical documents. This has resulted in faster land registration and easier access. However, the implementation of electronic land registration is not without major obstacles, namely those arising from technological infrastructure aspects, which prevent the full implementation of electronic land registration. Obstacles in the technological infrastructure aspect include weak internet networks or limited server capacity experienced in several land offices.

The implementation of electronic land registration has received mixed responses from the public. Some people are skeptical about the validity of electronic certificates compared to conventional certificates. This is understandable, given that people have been accustomed to conventional paper certificates for years. Public concerns about the possibility of data loss and difficulties in the land rights recognition process in the event of land disputes are factors that hinder the acceptance of the new electronic system.

Nevertheless, the implementation of electronic land registration, which was previously carried out conventionally, has generally had a positive impact on the speed of service. Conventional land registration requires a long administrative process, while electronic registration requires a faster time. However, limited human resources, both in terms of quantity and quality of information technology training, still hamper the slowness of the electronic land registration process. Based on this, training land officers is a crucial factor in improving efficient service. The results of the aforementioned test indicate the need for adjustments and refinements to policies based on field evaluations so that the electronic system can be more responsive to user needs and optimally accepted by all parties. Furthermore, it is necessary to ensure that legal protection of land rights remains guaranteed during the transition from conventional to electronic systems.

The implementation of electronic land registration guarantees legal protection, provided by the government through the Indonesian National Land Agency, for electronic land registration products in the form of electronic certificates. The

legal protection contained in electronic certificates arises because the issuance of electronic certificates is based on statutory regulations.Electronic certificates issued using an electronic system will be validated by means of an electronic signature as determined by statutory regulations.

The guarantee of legal protection contained in electronic certificates is also evident in the electronic certificate instruments that surround them. These instruments include, among other things, that electronic certificates have a complete Field Identification Number (NIB), namely a Single ID as a reference for all land registration activities. The identification number is stated at the top. Based on the information from the electronic certificate, it has a unique code (hash code) for the document being issued and is connected through the electronic document publication edition. In addition, electronic certificates are also equipped with a QR Code that is used to directly access information on the electronic certificate with a system provided by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency of the Republic of Indonesia.

There are several differences between electronic certificates and manual, paper-based certificates. Electronic certificates feature a background pattern of fine, wavy lines, known as the continuous service pattern. Furthermore, the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) logo is placed in the center. There's also the addition of a red text pattern on the left side of the document.

Another feature of an electronic certificate is an electronic signature. The Ministry of Agrarian Affairs and Spatial Planning (ATR)/National Land Agency (BPN) stated that the electronic signature has a classic modern design, namely a signature specimen form equipped with a land office stamp. The logo of the Ministry of Agrarian Affairs and Spatial Planning (ATR)/National Land Agency (BPN) is placed on the upper left side, in a position parallel to the Garuda Bird symbol. Furthermore, the certificate also contains information regarding rights, prohibitions and responsibilities (RRR), including a picture of a land plot with its completeness in the form of a measurement letter and a QR Code pointing to the electronic measurement letter. Then at the bottom there is information containing knowledge regarding the provisions of electronic documents for the party holding the certificate. The Ministry of Agrarian Affairs and Spatial Planning (ATR)/National Land Agency (BPN) also includes the symbol of BSrE (Electronic Certification Agency), an agency that organizes electronic signatures, on the bottom right of the certificate.[14]

[14]Rio Prasetyo. (2022). “Problems Arising Due to the Issuance of Electronic Land Title Certificates,” in Business Law Journal, Volume 6 Number 1, April 2022, p. 799. url:https://jurnal.narotama.ac.id/index.php/hukumbisnis/article/view/1821. (Accessed February 7, 2026).

To maintain the security of electronic land rights certificates from irresponsible parties, electronic certificates are equipped with two-factor authentication (2FA) or two-step verification and electronic signatures that use certificate authority from the Electronic Certification Agency (BSrE).

Based on the provisions of Law Number 11 of 2008 concerning Electronic Information and Transactions (UU ITE), Electronic Signatures by BPN Officials who have the authority in question have legal force and legal impact that has validity. Legal protection and security of Electronic Certificates, electronic documents, and various data related to electronic land contained in the BPN data bank have also been guaranteed by Law Number 11 of 2008 concerning Electronic Information and Transactions in conjunction with Law Number 19 of 2016 concerning Law Number 11 of 2008 concerning Electronic Information and Transactions (UU ITE).

The party that can access electronic document data from Electronic Certificates is not just anyone but only the party that has the authority and in the investigation of the alleged crime as determined by the ITE Law, the implementation of which is based on the regulations according to the Criminal Procedure Code and the provisions regulated by the ITE Law. Regarding investigations related to Information Technology and Electronic Transactions as mentioned above, the implementation is with the protection of privacy, smooth public services, confidentiality, integrity and (data integrity) in accordance with the provisions of the regulations in force in Indonesia.

The implementation of e-certificates for Indonesia is a must to realize a modern future. To realize this, the government is also obliged to consider solving problems for people who still use manual or analog certificates, especially for people with limited understanding of the electronic land registration process, who need to obtain assistance from the local land office, the process and procedures of land registration, both for the purpose of registering land for the first time and transferring data from manual data format to electronic data format, where all the processes are carried out by transferring encrypted data. Although the implementation of the land registration process is still carried out by the land office, the resulting product is an e-certificate.

The storage of e-certificates in the database is carried out with multi-layered security. This implies that information about land title documents cannot be changed unless there is a request made by the land title owner during the implementation of the certificate data maintenance. The implementation of e-certificate storage is intended to provide additional security against the possibility of flooding, fire hazards, or the risk of loss or theft by the land owner. There are several important things designed in order to protect the ownership rights and security of e-certificates which are legal proof of land ownership comparable to manual or conventional certificates. Based on this, e-certificates can be used as

evidence in court proceedings and provide assurance to rights holders that the property rights in question are fully recognized under the law.

Viewed from the aspect of data security and privacy, the government has implemented very strict digital security standards in order to provide protection for e-certificate data against illegal or unauthorized access or leaks to minimize the risk of hacking or misuse of data, during the validation process for the purposes of certificate validity to verify the authenticity of the certificate through a fast method that minimizes the possibility of certificate forgery which is an incident that often occurs with conventional certificates. Protection in the process of transferring the function or transfer of e-certificate rights is carried out through integration with national ownership data which is carried out centrally, thus causing the process of transferring the function or transfer of land rights to be carried out to be more open and documented and supervision and control carried out by the National Land Agency gives full responsibility for the management and supervision of e-certificate data.

Regarding the security of the use of e-Certificates, it can minimize duplication, denial, and forgery. Storage by the BPN-RI database and when digitally signed by the National Land Agency of the Republic of Indonesia (BPN-RI) Official who has the authority to implement electronic certificates, cryptographic operations combine the digital certificate and the document to be signed in a unique code (hashcode). This ensures the security of electronic document data because the process of securing electronic certificate information uses cryptography technology, such as cryptography by the National Cyber and Crypto Agency (BSSN). Electronic signatures function as a document authentication tool, namely that the digital document in question was issued using the Agrarian and Spatial Planning (ATR)/National Land Agency (BPN) electronic system and there have been no changes since the document was electronically signed.

4. Conclusion

Implementation of Electronic Land Registration at the Pekalongan Regency Land Officecan provide many benefits to the community, including minimizing fraud, minimizing brokers/land mafia, preventing corruption, preventing double certificates, saving costs, preventing disputes, conflicts and land cases, minimizing physical meetings, and reducing intervention by unauthorized parties. The implementation of electronic land services can be done through the Sentuh Tanahku application. The result of the implementation of electronic land registration is an electronic certificate. Electronic certificates are legally valid for use as evidence and can provide legal certainty because they are guaranteed by statutory regulations, namelyRegulation of the Minister of ATR/BPN No. 3 of 2023and Law Number 19 of 2016 Amendment to Law Number 11 of 2008 concerning Electronic Information and Transactions.Obstacles and solutions faced

in implementing electronic land registration at the Pekalongan Regency Land Officenamely the limited public understanding of electronic certificates, the lack of completeness of land registration application files, the Human Resources (HR) implementers who are still very limited and not ready to implement electronic land registration, the problem of an uneven internet network, and the implementation of land mapping that is not evenly distributed. Solutions that can be implemented to overcome these obstacles are through information dissemination activities or socialization to the community, conducting training or training and workshops for BPN and PPAT employees, collaborating with internet providers in order to equalize the network, accelerating updates and security of the land system and improving the Sentuh Tanahku application and strengthening security so that it is not easily hacked by irresponsible parties. In addition to the obstacles mentioned above, there are still problems in electronic land registration, namely the legal aspects and legal umbrella related to the legal force of the certificate due to technical regulations and concerns about data and cyber security. The government should be more active in disseminating information to the general public and Land Deed Officials (PPAT) regarding electronic certificates and their registration procedures to gain an understanding that using electronic certificates will guarantee greater legal certainty. PPATs should also be open and quick to learn about technological developments, especially those related to their work with land, because PPATs hold a very large responsibility and provide training and additional Human Resources (HR) in implementing land certificate registration via E-certificate.On the other hand mThe public should also have an open mindset towards technological developments, and actively participate in socialization activities carried out by the government, especially the Ministry of Agrarian Affairs and Spatial Planning (ATR)/National Land Agency (BPN), so that the public will not be disadvantaged in the future.

5. References

Journals:

Adisaputra, Muhammad Ilham, dkk. (2017), " Akuntabilitas Administrasi Pertanahan dalam Penerbitan Sertipikat", dalam *Jurnal Mimbar Hukum*, Volume 29, Nomor 2, Juni 2017, p.277 url: https://www.neliti.com/publications/196503/akuntabilitas-administrasi-pertanahan-dalam-penerbitan-sertifikat. (Accessed on 07 February 2026)

Darmadi, Anggi Roy dan Adiwinarto, Sulistio. (2025). "Aspek Hukum Penguasaan Fisik Bidang Tanah Sebagai Dasar Penerbitan Hak Milik Atas Tanah pada Program Pendaftaran Tanah Sistematis Lengkap (PTSL) Ditinjau Berdasarkan Prinsip Kepastian Hukum" dalam *Indonesian Journal of Law and Justice* Volume: 3, Number 1, 2025, p.2. url: https://journal.pubmedia.id/index.php/lawjustice/article/view/4655/3975 (Accessed on 07 February 2026).

Nafan, M. (2022), "Kepastian Hukum Terhadap Penerapan Sertipikat Elektronik Sebagai Bukti Penguasaan Hak Atas Tanah Di Indonesia", dalam *Jurnal*

Pendidikan Tambusai, Vol. 6, No. 1, p.3342–3355 (Accessed on 07 Febrari 2026)

Marjoni, Salma, dkk. (2025) "Pendaftaran Tanah Secara Elektronik Di Kantor Pertanahan Kota Padang", dalam *Sibatik Journal,* Volume 4 No 11 (2025), url: https://publish.ojsindonesia.com/index.php/SIBATIK/article/view/3741/1524 (Accessed on 07 February 2026).

Putri, Yola Amanda, dkk. (2022). " Inovasi Pelayanan Informasi melalui Aplikasi Sentuh Tanahku pada Kantor Pertanahan Kota Administrasi Jakarta Utara", dalam *Journal of Social and Policy Issues*, Volume 2 Nomor 2 (2022) April-June, p.87 url: https://journal.pencerah.org/index.php/jspi/article/view/45/37. (Accessed on 07 February 2026)

Prasetyo, Rio. (2022). "Problematika Yang Muncul Karena Penerbitan Sertipikat Hak Atas Tanah Elektronik", dalam *Jurnal Hukum Bisnis,* volume 6 Nomor 1, April 2022,url:https://jurnal.narotama.ac.id/index.php/hukumbisnis/article/view/1821. (Accessed on 07 February 2026).

Rachman, AMI Rachman & Hastri ED. (2021), "Analisis Kendala Implementasi Peraturan Menteri ATR / Kepala Bpn Nomor 1 Tahun 2021 Tentang Sertipikat Elektronik", dalam *Mulawarman Law Review*, Vol. 6, No. 2, p.91–104. url: https://e-journal.fh.unmul.ac.id/index.php/mulrev/article/view/646/227. (Accessed on 07 February 2026).

Rahman, Arif Muammar. (2021). "Prosedur Penerbitan Sertipikat Elektronik Sebagai Bukti Autentik Penguasaan Hak Atas Tanah", dalam *Juridica: Jurnal Fakultas Hukum Universitas Gunung Rinjani,* Volume 3 Nomor 1 November 2021, url: https://juridica.ugr.ac.id/index.php/juridica/article/download/191/147/721 (Accessed on 07 February 2026)

Wirdaniati, Wida, dkk., "Model Legalisasi Sertifikasi Tanah Di Perdesaan dan Proyeksi Terhadap Nilai Manfaat Kepemilikan", dalam *Jurnal Hukum Unissula,* Volume 38 No. 2, Agustus, p.124, url: https://www.researchgate.net/publication/362735303_Model_Legalisasi_Sertifikasi_Tanah_di_Perdesaan_dan_Proyeksi_terhadap_Nilai_Manfaat_Kepemilikan, (Accessed on 07 February 2026).

Books:

Irwan Soerodjo. (2003). *Kepastian Hukum Hak Atas Tanah di Indonesia*, Surabaya: Arloka.