

Strengthening legal protection for communities that own electronic land certificates as a result of technology development

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ABSTRACT

The rapid development of technology driven by globalization has transformed many aspects of legal and administrative systems, including land administration, in Indonesia. The implementation of electronic land certificates (E-certificates) aims to improve the efficiency, transparency, and legal certainty of land services. However, this transformation also introduces various legal and technical challenges, such as data security vulnerabilities, cyber threats, insufficient infrastructure, and low levels of digital literacy among the public. These issues increase the risk of data misuse and weaken legal protection for landowners, especially lower-income communities that face difficulties accessing digital resources and defending their rights. This study emphasizes the importance of strengthening legal protection mechanisms for holders of electronic land certificates by improving cybersecurity systems, establishing clear procedural regulations for dispute resolution, and enhancing digital literacy across society. Additionally, legal policies must align with the values of Pancasila and the 1945 Constitution to ensure fairness, inclusivity, and sustainability in the protection of land ownership rights. Strengthening legal certainty and data protection is crucial for realizing a safe and equitable digital land administration system in Indonesia.

Keywords: Environmental Pollution, Crimes, Environmental Tax

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1. INTRODUCTION



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Land is essential for humans and other creatures on Earth as a gift from God Almighty to sustain life. In fact, land and the houses built on it are one of their primary needs. Everyone is very dependent on land, as it is a treasure/asset, a reserve for future life, and the place where human and/or animal remains return.

The existence of land in human life has meaning and serves a dual function, namely, as a social asset and a capital asset. Land as a social asset is a means of binding social unity among communities in life, while land as a capital asset is a factor of development capital and has grown to become a very important economic commodity and a commodity for trade. The basis of the state's right to control the land, water, and everything contained therein gives rise to an obligation on the part of the state to carry out land registration throughout the territory of the Republic of Indonesia (Priyantiwi, 2023).

The essence of land regulation stipulates that a certificate is valid proof of land ownership rights. Land title certificates as proof of ownership are issued by the Head of the National Land Agency (BPN) through a land registration process. The certificate of land rights consists of a copy of the land registry and a survey letter bound together and given to the rightful landowner.

Certificates of land ownership require legal certainty, certainty of land ownership rights, and legal protection for owners. This makes it easy and efficient for the owner to prove that he or she has rights to a particular plot of land based on the land ownership certificate obtained (Hidayanti et al., 2021).

A land certificate provides the owner with a legal title to the land. The certificate serves as proof that the land has been registered with the National Land Agency (BPN), stating the person entitled to the land and its status as freehold, right to cultivate, right to build, and so on. Land certificates must be fully supported by facts stated in the certificate as valid evidence for the owner; the sole purpose is to ensure legal certainty (Faruq & Hariri, 2023).

Electronic land certificates (e-certificates) are gradually replacing paper or physical certificates as proof of land ownership. Some advantages of electronic land certificates include minimizing land certificate forgery, preventing illegal land transactions commonly carried out by land mafias, and facilitating land transactions and administration. However, despite these advantages, as an electronic product, it is not without various disadvantages that are not widely known, especially by those who are not familiar with information technology and electronic systems, which has an impact on the weak legal protection for landowners who have electronic certificates (Apriani & Bur, 2021).

A good policy needs to consider the benefits and efficiency of services and ensure the protection of the rights of individuals or legal entities to provide strong legal protection for those who need such instruments. The expected implications of electronic land certificates include increased effectiveness and efficiency in providing better land services, both in terms of service time and other aspects, such as cost reduction. Legal certainty and security or legal protection also need to be given serious consideration by policymakers (Rajab et al., 2020).

A good policy must be measured by its results. The extent to which the electronic land certificate policy can provide certainty and legal protection to landowners is an interesting issue to discuss in this study, as it is a measure of the policy's effectiveness. Although e-certificates offer greater efficiency and security than physical certificates, challenges must be overcome, particularly in terms of data development, technological readiness, and public education.

The policy on electronic land registration is only regulated at the level of Government Regulation No. 18 of 2021, Minister of Agrarian Affairs and Spatial Planning/National Land Agency Regulation No. 1 of 2021, and Minister of Agrarian Affairs and Spatial Planning/National Land Agency Regulation No. 3 of 2023, not in Law No. 5 of 1960 (UUPA), which is alternative in nature. However, in practice, it is mandatory because people who conduct land sale and purchase transactions or transfer rights to land with physical certificates will automatically be replaced with electronic land certificates.

Legal protection for landowners holding electronic certificates against digital abuse or crime remains uncertain, posing a new threat. From a technical standpoint, electronic land certificates are highly vulnerable and easily hacked by hackers or electronic media cyberattacks. This means that the country's policy does not protect but rather reduces the legal protection for holders of electronic land certificates,

especially for the lower-middle class, who will find it difficult to defend their rights because not everyone understands and is familiar with digital technology, and it also increases the cost of legal action. It should be noted that even electronic data in the United States can be hacked and damaged by hackers, let alone in Indonesia.

Another example of the vulnerability of digital data storage to cyber-attacks occurred at the Temporary National Data Center (PDNS) on June 20, 2024, which paralyzed several services, including immigration services. The government itself admitted that it failed to prevent and counter the hacker attack, which resulted in the locking or hijacking of data stored by 282 government agencies. What if this were to happen to electronic land certificates? Based on this example of data hacking, it is possible that electronic land certificates, which are being promoted by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN), could also be hacked (Shella & Ramasari, 2022).

New innovation policies in the field of land administration, or the transition from physical land certificates to electronic land certificates, remain a hot topic because of low public awareness, data hacking, and legal protection issues. This situation has caused concerns among the public regarding their land data stored in the form of electronic certificates on the Internet. Electronic data protection in the land sector needs to be strengthened to anticipate cyber-attacks by hackers, which will certainly have a detrimental impact on the community, especially on holders of electronic land certificates.

The weaknesses of electronic certificates (e-certificates) can be illustrated through various case studies. For example, hackers used Mimecast 365 certificates to breach information and/or encrypt messages sent and received by the users. This incident occurred in 2021 at the email management provider Mimecast, where hackers stole the digital certificates issued by the company and used them to encrypt data through the company's cloud-based services. The certificates were used by perpetrators for approximately 10 percent of the company's customers, totaling approximately 36,100 certificates. Hackers targeted specific customers who sent and received data through the services.

Electronic data protection in Indonesia remains weak in terms of security, even though regulations are in place. The relevant regulations are Law Number 11 of 2008 concerning Electronic Information and Transactions along with the first amendment to Law Number 19 of 2016 along with the second amendment to Law Number 1 of 2024 (UUIITE) and Law Number 27 of 2022 concerning Personal Data Protection (UUPDP), as well as Regulation of the Minister of Agrarian Affairs/Head of BPN Number 1 of 2021 concerning Electronic Certificates. This law does not yet have preventive instruments against data hacking in Indonesia carried out by hackers.

A hacker is a person who has the ability/skill to master information systems and electronic transactions that are misused to break into and/or hack into a security system belonging to another person or legal entity. There have been many cases of cybercrime committed by hackers, which are clear evidence of the weakness of electronic media as a means of storing public land data. The state can provide preventive legal protection before a violation of the law occurs. Examples include the socialization of laws, strengthening regulations, licensing, public legal counseling and education, and strengthening government systems and policies to prevent unlawful acts. Repressive legal protection is provided after a violation of the law occurs. Examples include the state's ability to provide fast, simple, and inexpensive judicial facilities and processes, the application of criminal and civil sanctions, compensation for victims, and other legal actions aimed at upholding justice.

2. METHOD

This study used normative research. The reason for using This normative research method was used because the first, second, and third issues require normative data related to the regulatory basis governing legal protection for landowners who already have electronic certificates, its legal force as evidence, and aspects of legal protection in its implementation in the field through a case approach (Abdussamad & Sik, 2021). This study used descriptive and prescriptive methods (Ruslan, 2010). The primary legal materials include: Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA); Law Number 6 of 2023 concerning the Stipulation of Government Regulation in Lieu of Law Number 2

of 2022 concerning Job Creation into Law (Job Creation Law or Omnibus Law); Law Number 2 of 2014 concerning Amendments to Law Number 30 of 2004 concerning Notary Positions (UUJN); Law Number 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Electronic Information and Transactions (UUITE); Government Regulation Number 18 of 2021 concerning Management Rights, Land Rights, Apartment Units, and Land Registration; Ministerial Regulation (Permen) ATR/BPN Number 1 of 2021 concerning Electronic Certificates; and Permen ATR/BPN Number 3 of 2023 concerning Improvements to Electronic-Based Land Registration Services. The data in this dissertation were analyzed qualitatively using descriptive and analytical methods to interpret secondary data obtained from various legal materials (Asikin, 2016).

3. RESULT AND DISCUSSION

3.1 Regulations Govern Legal Protection for Landowners Who Already Have Land Certificates in Book Form Based on Legislation

Technology plays a crucial role, both positively and negatively, making this digital era a new challenge. Challenges in this era include politics, sociocultural aspects, defense, and information technology itself. Digital was born with the Internet network, especially computer information technology. Media capabilities make it easier for people to receive information more quickly, even without face-to-face meetings. Technology will continue to evolve, like ocean currents that continuously flow through human lives. Therefore, it is necessary to master and manage technology to provide the greatest possible benefits.

The current digital era is called the Era of Digital Disruption. Digital disruption is a massive change that marks the transition from offline to online. Advances in science and technology have also penetrated land administration, with the implementation of land registration that can be done electronically, and the results of land registration are in the form of electronic data and information, no longer in books. This electronic certificate transformation supports a paperless office culture in the digital era, making it easier to maintain, manage, and access anytime and anywhere.

Currently, problems with certified land still persist, such as mismatched dimensions, overlapping claims, litigation, and the emergence of duplicate certificates, where a plot of land is registered under two certificates, both officially issued by the Regency/City Land Office. Duplicate land title certificates can arise for several reasons, including: (1) during field measurements or research, the applicant intentionally indicates the location and boundaries of the land; (2) the existence of a certificate of proof or acknowledgment of title is proven to be intentionally false or no longer valid; (3) there is no land registration map available for the area in question; and (4) duplicate certificates can also arise due to administrative errors.

With the digital transformation within the Ministry of ATR/BPN, Ministerial Regulation No. 1 of 2021, concerning electronic certificates, was issued. This was in response to the Ministry's previous implementation of four electronic services: Electronic Mortgage Rights, Certificate Verification, Land Value Zones, and Land Registration Certificates. This regulation allows land registration processes, previously conducted analogously, to be carried out electronically, including initial land registration and data-management. The transition from conventional to electronic certificates is expected to reduce the number of disputes, conflicts, and court cases regarding land (Ramisan, 2023).

A certificate is a document proving rights as referred to in Article 19 (2) (C) of the UUPA for land rights, management rights, waqf land, ownership rights to apartment units, and mortgage rights, each of which has been recorded in the relevant land register. Meanwhile, an electronic certificate is "a certificate issued through an electronic system in the form of an electronic document." By "electronic document" we mean a printed copy that constitutes valid legal evidence and an extension of valid evidence in accordance with applicable Indonesian Procedural Law. For evidentiary purposes, electronic documents can be accessed using an electronic system.

The Indonesian government has established a legal basis for electronic land certificates to guarantee legal protection, validity, and security. Related laws and regulations include (Hidayanti et al.,

2021): (1) Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA), which stipulates that land certificates are valid proof of land ownership; (2) Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE), as amended by Law Number 19 of 2016; (3) Government Regulation No. 18 of 2021 concerning Management Rights, Land Rights, Apartment Units, and Land Registration; and (4) ATR/BPN Ministerial Regulation No. 1 of 2021 concerning Electronic Certificates, which confirms that electronic land certificates have the same legal force and evidential value as physical (regular) certificates. Regulates the transition from physical certificates to electronic form, the mechanism for issuing, storing, and managing digital certificates; (5) ATR/BPN Regulation Number 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activities.

Article 84 of Government Regulation Number 18 of 2021 contains provisions regarding the administration and implementation of land registration, which “may” be carried out electronically. The results of the implementation and execution of electronic land registration are data, electronic information, and electronic documents. Data, electronic information, and/or their printed results constitute valid legal evidence and are an extension of valid evidence in accordance with the applicable procedural law in Indonesia. The implementation of electronic land registration is carried out in stages, considering the readiness of the electronic system developed by the Ministry (Shella & Ramasari, 2022).

Article 85 of Government Regulation Number 18 of 2021 stipulates that all data and/or documents related to land registration activities shall be stored and presented in the form of electronic documents using information and communication technology. Such data and/or documents shall be stored electronically in the Ministry's database. For the purposes of evidence in court and/or the provision of land information requested by agencies that require it for the performance of their duties, such data and/or documents can be accessed through an electronic system (Chandra, 2019).

The obligation to register land electronically to obtain an electronic land certificate is not explicitly stated in Law No. 5 of 1960 concerning Basic Agrarian Principles (UUPA), the highest law governing land in Indonesia. Electronic certificates are regulated only by the UUIITE. However, in practice, when people conduct land rights transfer transactions, such as buying and selling, they are forced and/or required to follow the procedures for obtaining electronic land certificates, even though they often refuse to do so because of doubts and uncertainties about the protection of their rights from electronic data hacking.

Furthermore, Chapter VII of Government Regulation (GR) Number 18 of 2021 concerning Management Rights, Land Rights, Apartment Units, and Land Registration (GR Number 18 of 2021) regulates electronic land certificates. However, the GR does not mandate electronic land registration. Article 84, paragraph (1) of GR No. 18 of 2021 stipulates that “The administration and implementation of land registration can be done electronically.” The word ‘can’ in this provision is not an obligation but an “alternative.” However, the National Land Agency (BPN) requires the administration of electronic land certificates.

Article 2, paragraph (1) of ATR/BPN Regulation Number 1 of 2021 concerning Electronic Certificates also confirms the alternative provision by using the word “may” as follows: “Land registration may be carried out electronically.” Article 2 of ATR/BPN Regulation Number 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activities also emphasizes the same thing that land registration is carried out by the Ministry of ATR/BPN, which “may” apply information and communication technology implemented through an electronic system.

The policy on electronic land registration is only regulated at the level of Government Regulation No. 18 of 2021, Minister of Agrarian Affairs and Spatial Planning/National Land Agency Regulation No. 1 of 2021, and Minister of Agrarian Affairs and Spatial Planning/National Land Agency Regulation No. 3 of 2023, not in Law No. 5 of 1960 (UUPA), which is alternative in nature. However, in practice, it is mandatory because people who conduct land sale and purchase transactions or transfer rights to land with physical certificates will automatically be replaced with electronic land certificates.

3.2 Legal Protection for Landowners be Strengthened with Regard to the Policy of Electronic Land Certificates as Authentic Deeds the Field of Land

The theory of legal protection will be used to strengthen the legal protection of land certificate holders under the electronic land certificate policy in the land sector. The theory of legal protection is inseparable from the legal system of a particular country. Indonesia's legal system is based on Pancasila and the 1945 Constitution (UUD 1945). The national legal sector is based on Pancasila and the 1945 Constitution of Indonesia. The fourth paragraph of the Preamble to the 1945 Constitution states, "Then, to form an Indonesian State Government that protects the entire Indonesian nation...".

The phrase "all Indonesian people" refers to the unity of the entire Indonesian nation (the third principle of Pancasila). The word "protect" means legal protection for every Indonesian citizen, without distinction based on ethnicity, religion, gender, wealth or poverty. Protecting the entire Indonesian nation essentially shows that Indonesia is a constitutional state (rechstaat), one of the characteristics of which is human rights protection.

Fitzgerald integrates legal objectives with various interests in society by limiting them because, in a conflict of interests, the protection of certain interests can only be achieved by limiting the interests of other parties. Human interests are demands that must be protected by the law. Roscoe Pound divided these protected human interests into three categories: public, social, and private.

The state's duty is to protect public interests. Protecting the interests of society covers a wide range of aspects, including the economy, health, and security. Protection of individual interests includes protection of privacy rights (e.g., land rights), physical integrity, freedom of will, reputation (good name), confidentiality of personal secrets, and freedom to practice religion.

This theory of legal protection requires limiting the interests of other parties in order to carry out the interests of another party. The theory of legal protection in the view of Philipus M. Hadjon:

Legal protection imposes an obligation on a number of legal subjects to immediately obtain certain resources in order to ensure the continued existence of legal subjects that are guaranteed and protected by law, so that their power is organized in the political and economic decision-making process, particularly in the distribution of resources, both at the individual and structural levels.

Restricting the rights of one party to grant rights to another party so that the law can protect all interests can interact. In this case, "at the very least, a wall, though often a winding and transparent one, had to protect the market from politics and the private citizen from personal subordination to the officeholder: this wall is the legal system.". According to Satjipto Rahardjo, walls as barriers are necessary to ensure that certain groups in society are not always defeated by others.

The theory of legal protection requires existing laws and regulations to serve as a means (tool) to provide legal protection for various interests. According to Satjipto Rahardjo, legal protection is the act of providing services to people whose human rights have been violated so that they can enjoy their rights as granted by law.

Legal protection provides safeguards for human rights so that individuals can enjoy the rights granted by law. According to Philipus M. Hadjon, legal protection protects the dignity and integrity of legal subjects based on legal provisions against arbitrariness. The law protects a person's interests by allocating power to the state to act in a measured or balanced manner.

Legal protection, according to Philipus M. Hadjon, includes preventive and repressive legal protection. Preventive legal protection requires preventing cases from occurring rather than punishing them. Preventive legal protection in Indonesia is still inadequate. The state must provide its people with a sense of security and comfort. Repressive legal protection is aimed at resolving disputes/cases (Sari et al., 2019).

The application and enforcement of laws must not neglect the aspect of legal protection. When discussing the theory of legal protection, it is synonymous with a power or right possessed by a person or entity, which is measurable and balanced. The law can be used to provide protection that is not only adaptive and flexible, but also predictive and anticipatory.

The balance between the fundamental values of law and legal certainty, the usefulness of law and legal justice, and the purpose of law, although in practice these fundamental values are generally at odds with each other, must be sought to be achieved simultaneously and fairly. If the law is not allowed to flow according to its principles, then parties who are in a weak position within the legal system will potentially

not be protected (Sutedi, 2020).

Efforts to protect the rights of the community mean protecting their individual (private) interests as well as those of certain groups. Protection of electronic land certificates is an individual right and also has economic implications. At the level of land regulation, protection of the rights of the community in cyberspace can be achieved by strengthening regulations and limiting/ countering attempts by lawbreakers to obtain commercial gain.

4. CONCLUSION

Based on the explanation and case examples above, considering the impact of technological development based on the globalization of information technology with various weaknesses in electronic data security systems, the state has not been able to provide strong legal protection to the public and users of websites or internet applications that are being implemented for electronic land certificates. Legal protection guarantees for the public's electronic land certificate data are certainly an interesting and important matter that needs to be strengthened by the state, considering that land issues are rights guaranteed in the 1945 Constitution.

Ethical Approval

Ethical approval was not required for this study.

Informed Consent Statement

This study did not involve human participants; therefore, informed consent was not required for this study.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Data Availability Statement

The data presented in this study are available on request from the corresponding author due to privacy reasons.

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Notes on Contributors

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REFERENCES

- Abdussamad, H. Z., & Sik, M. S. (2021). *Metode penelitian kualitatif*. CV. Syakir Media Press.
- Apriani, D., & Bur, A. (2021). Kepastian hukum dan perlindungan hukum dalam sistem publikasi pendaftaran tanah di indonesia. *Bina Mulia Hukum*, 5(2), 221–239. <https://doi.org/10.23920/jbmh.v5i2.11>
- Asikin, Z. (2016). *Pengantar metode penelitian hukum*.
- Chandra, T. (2019). Non-Litigation Process Land Dispute Settlement for Legal Certainty. *Substantive Justice International Journal of Law*, 2(2), 177–194. <https://doi.org/10.33096/substantivejustice.v2i2.49>
- Faruq, F. U., & Hariri, A. (2023). LEGAL CERTAINTY CERTIFICATE OF LAND RIGHTS UNDER NATIONAL LAW. *Progressive Law Review*, 5(02), 169–180.
- Hidayanti, S., Koswara, I., & Gunawan, Y. (2021). The land legal system in Indonesia and land rights

according to the basic agrarian law (UUPA). *Legal Brief*, 11(1), 366–378.

- PRIYANTIWI, R. D. W. I. (2023). NALISIS PUTUSAN MAHKAMAH KONSTITUSI NO. 91/PUU-XVIII/2020 TENTANG PENGUJIAN UU CIPTA KERJA PERSPEKTIF MASLAHAH MURSALAH. *WEBINAR HAK UJI MATERIIL PADA BAB PENJELASAN UNDANG-UNDANG LANDASAN DAN AKIBAT HUKUMNYA*.
- Rajab, R. A., Turisno, B. E., & Lumbanraja, A. D. (2020). Sertifikat Hak Atas Tanah Dalam Kepastian Hukum Pendaftaran Tanah. *Notarius*, 13(2), 642–654. <https://doi.org/10.14710/nts.v13i2.31085>
- Ramisan, J. M. (2023). Peralihan Hak Atas Tanah Negara Berdasarkan Prinsip Reforma Agraria Menurut Undang-Undang Nomor 5 Tahun 1960 Tentang Peraturan Dasar Pokok-Pokok Agraria. *Lex Privatum*, 12(3).
- Ruslan, R. (2010). *Metode penelitian public relations dan komunikasi*.
- Sari, N. A. N., Tambunan, E., Felany, P. I., & Nugraha, X. (2019). Implikasi Penafsiran Hak Menguasai Negara Oleh Mahkamah Konstitusi Terhadap Politik Hukum Agraria Pada Pulau-Pulau Kecil Di Indonesia. *Law Review*, 170–202.
- Shella, S. A., & Ramasari, R. D. (2022). Tinjauan yuridis kekuatan hukum sertifikat tanah elektronik berdasarkan peraturan menteri agraria dan tata ruang nomor 1 tahun 2021. *Jurnal Hukum Dan Etika Kesehatan*, 1–14.
- Sutedi, A. (2020). *Implementasi prinsip kepentingan umum di dalam pengadaan tanah untuk pembangunan*. Sinar Grafika.