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Obstacles in the Implementation of Digital Land Certificates at the Ministry of Agrarian Affairs and Spatial Planning / National Land Agency of The Republic of Indonesia

Dedy Wahyu Asari[1], Miftakhul Huda[2].
[1]Universitas Narotama Surabaya, Surabaya, Indonesia, Dedyunited86@gmail.com
[2]Universitas Narotama Surabaya, Surabaya, Indonesia, miftakhul.huda@narotama.ac.id

Corresponding Author: Dedyunited86@gmail.com[1]

Abstract: The digital transformation of land administration in Indonesia aims to enhance efficiency, transparency, and security in land ownership documentation through the implementation of digital land certificates. However, this system faces several challenges that must be addressed for optimal implementation. The three main obstacles in implementing digital land certificates at the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) are regulatory inadequacies, technological infrastructure limitations, and public resistance. Existing regulations do not fully support digitalization, leading to legal uncertainty and complex coordination between central and local governments. Additionally, unequal technological infrastructure, especially in remote areas, poses challenges in ensuring system accessibility. Public resistance is another significant hurdle, as many still trust physical land certificates over digital documents.

Keywords: Digital Land Certificate, Regulation, Technological Infrastructure

INTRODUCTION

Digital transformation in land administration is a strategic initiative undertaken by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) to enhance public service efficiency, transparency of land ownership, and the security of land documents. The implementation of digital land certificates aims to replace physical land certificates with documents based on information technology, thereby making land administration processes faster, more secure, and more accessible to the public. This digitalization also aligns with the government's efforts to accelerate bureaucratic reform and reduce the potential for abuse and corrupt practices that are often associated with the manual land certification process. However, despite the various benefits offered by the concept of digital land certificates, its implementation in Indonesia still faces many challenges that must be addressed promptly in order for the system to function optimally and gain acceptance from the public and other stakeholders (Adinegoro, K. R. R., 2023).

One of the main obstacles in implementing digital land certificates is the lack of regulatory readiness to support a comprehensive digital ecosystem. Although Ministerial Regulation of ATR/Head of BPN Number 1 of 2021 concerning Electronic Certificates has provided a legal foundation for the digitalization of land certificates, several other regulations are still based on conventional systems and have not explicitly accommodated the transition from physical to digital certificates. Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA), which serves as the main legal foundation for Indonesia's land system, does not include provisions regarding land certificates in digital form. Furthermore, although Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law) recognizes electronic documents as valid legal evidence, its implementation in the context of land affairs still requires further harmonization with other regulations. This regulatory unpreparedness results in legal uncertainty for the public and stakeholders involved in land administration processes. Additionally, the overlapping authorities between the central and regional governments in managing the digital land system also present challenges, as the system requires more integrated cross-sectoral coordination. If not addressed promptly, these regulatory issues could hinder the acceleration of digital land certificate implementation and potentially lead to legal disputes in the future **(**Alam, A., Sriwidodo, J., 2023).

In addition to regulatory barriers, technological infrastructure limitations also pose a major challenge in the implementation of digital land certificates. This system requires reliable information technology infrastructure support, including stable internet connectivity, large server capacity, and robust data security systems. However, there is still a technological infrastructure gap between urban and rural areas in Indonesia. Many land offices in remote regions lack adequate internet access or well-integrated digital systems. This situation makes it difficult to access land data in real-time, thereby slowing down the issuance process of digital land certificates. Moreover, the technological systems at the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) are still under development and not yet fully connected with other related institutions, such as local governments, notaries, and financial institutions. This results in problems related to data validation, document authentication, and monitoring of land transactions in a digital environment. Other technical risks, such as power outages, software failures, and potential cyberattacks, also pose threats that need to be anticipated. Such disruptions may result in the loss of access to electronic documents and potentially hinder land services. Therefore, significant investment in the development of technological infrastructure is urgently needed to ensure that the digital land certificate system can operate optimally across all regions of Indonesia.

In addition to regulatory and infrastructure challenges, human resource (HR) readiness is also a crucial factor in the implementation of digital land certificates. The digitalization of the land administration system requires a workforce skilled in information technology, particularly in electronic system management and cybersecurity. However, many employees at the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN), especially those in regional offices, still lack the competence to operate these digital systems. This lack of technical skills can lead to various issues in implementing digital land certificates, such as data entry errors, slow administrative processes, and potential misuse of the system. On the other hand, the public also remains largely unfamiliar with how to access and use digital land certificates, particularly in areas with low levels of digital literacy.

Many people are still accustomed to manual systems and feel more comfortable with physical certificates, which are perceived as more tangible and easier to verify. Therefore, training and capacity-building programs are necessary for ATR/BPN personnel so that they can manage digital systems more effectively. In addition, widespread education and public outreach are essential to help the public understand the benefits and procedures of using digital land certificates. With improved human resource skills and better public education, resistance to the digital system is expected to decline, enabling the public to more easily adapt to the changes (Maulana, H., Nugraha, 2024).

Data security is also a critical issue in the implementation of digital land certificates. As electronic documents containing vital information regarding land ownership, digital certificates are highly susceptible to threats such as hacking, data manipulation, and personal information leaks. In accordance with Law Number 27 of 2022 on Personal Data Protection, the government is obligated to ensure that the land information system is equipped with strong cybersecurity measures to prevent data theft or misuse. Nevertheless, there are ongoing concerns that the digital system remains vulnerable to cyberattacks capable of damaging or deleting ownership data on a large scale. Additionally, the risk of digital document forgery remains a concern, even though electronic certificates are already equipped with digital signatures and encryption systems. To ensure the security of digital land certificates, additional protection mechanisms—such as the use of blockchain technology or multi-layered authentication systems—are needed. With enhanced security systems, the risks of hacking and data misuse can be minimized, thereby increasing public confidence in using digital land certificates.

In addition to technical and regulatory barriers, resistance from the public and stakeholders also poses a challenge to the implementation of digital land certificates. Many people still feel more comfortable with physical land certificates, as they are perceived to be more tangible and easier to verify. Among notaries and land officials, concerns persist about the legal validity of electronic certificates, particularly in land dispute cases. Some parties also fear the potential misuse of the system by irresponsible individuals. Therefore, an effective communication strategy and more intensive public education are essential to enhance understanding and trust in the digital system. The government must actively promote the benefits and security features of the electronic land certificate system and provide guidance to the public during the transition from manual to digital systems.

METHOD

Normative juridical legal research is a method that focuses on the study of laws and regulations as well as legal norms prevailing within a legal system. This approach is carried out by examining written legal rules, including the constitution, laws, government regulations, and court decisions relevant to the issue under study. In normative juridical research, law is viewed as an autonomous norm; thus, the analysis is directed toward the principles of law, the systematization of legal norms, as well as the harmonization and synchronization of statutory regulations.

This method is often used to identify deficiencies in regulations, provide interpretations of legal norms, and propose normative solutions to emerging legal problems. The primary data sources in this research are primary legal materials such as laws and court decisions, and secondary legal materials such as legal journals, doctrines, and expert opinions. The results of normative juridical research are generally prescriptive, offering legal recommendations or suggestions to improve or clarify certain rules. Therefore, this method is widely applied in legal research related to constitutional law, civil law, and criminal law, to ensure that the existing legal framework remains aligned with social developments and societal needs.

RESULTS AND DISCUSSION

Major Obstacles In The Implementation Of Digital Land Certificates At The Ministry Of Agrarian Affairs And Spatial Planning / National Land Agency Of The Republic Of Indonesia

The digital transformation of land administration is a strategic initiative aimed at enhancing public service efficiency, transparency, and the security of land ownership data. One of the modernization efforts undertaken by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) is the implementation of electronic or digital land certificates. This policy is aligned with Ministerial Regulation of ATR/Head of BPN No. 1 of 2021 on Electronic Certificates, which seeks to replace physical land certificates with digital documents based on information technology. Despite the numerous benefits offered by this system, its implementation faces several obstacles that must be addressed to ensure its optimal functionality and acceptance by the public and other stakeholders. The main challenges in implementing digital land certificates include regulatory and policy issues, technological infrastructure limitations, human resource readiness, data and cybersecurity threats, and resistance from the public and stakeholders. Therefore, an in-depth study of these challenges is essential to ensure the program's sustainability and to maximize its benefits for both society and the government (Febrianti, S., 2021).

One of the primary challenges in implementing digital land certificates is the lack of regulatory readiness to support a fully integrated digital ecosystem. Although Ministerial Regulation of ATR/BPN No. 1 of 2021 provides a legal basis for electronic certificates, several other existing regulations are still based on conventional systems and do not explicitly accommodate the digitalization of land certificates. For instance, Law No. 5 of 1960 on Basic Agrarian Principles (UUPA) does not include provisions for electronic land certificates. Additionally, while Law No. 11 of 2008 on Electronic Information and Transactions (ITE) recognizes electronic documents as valid legal evidence, its application in the land sector still requires further harmonization with other regulations. Beyond the incomplete regulatory framework, overlapping authority between central and regional governments in managing the digital land administration system also presents a significant challenge. This lack of coordination can lead to legal uncertainty and potentially increase land disputes in the future. Therefore, a more comprehensive regulatory reform is necessary to ensure that the digital system operates with strong legal certainty and does not create new problems.

In addition to regulatory challenges, limitations in technological infrastructure present a significant obstacle to the implementation of digital land certificates. This system heavily relies on robust information technology, including stable internet networks, high-capacity servers, and secure national data centers. However, there remains a considerable technological infrastructure gap between urban and rural areas in Indonesia. Not all land offices—particularly those in remote regions—have access to adequate internet connectivity or well-integrated digital systems. Furthermore, the technological systems currently in place at ATR/BPN are still under development and are not yet fully integrated with other relevant institutions, such as local governments, notaries, and financial institutions. Technical risks such as system disruptions, power outages, and software failures also pose challenges that must be anticipated. These disruptions can result in lost access to electronic documents and potentially hinder land services. Therefore, large-scale investment is required in developing the necessary technological infrastructure, including improving server capacity, strengthening system security, and ensuring better integration with key stakeholders so that the digital land certificate system can function optimally (Suharto, B., 2023).

Beyond regulatory and infrastructure challenges, the readiness of human resources (HR) is also a critical factor in the implementation of digital land certificates. The digitalization process requires personnel with expertise in information technology, particularly in managing electronic systems and cybersecurity. However, many ATR/BPN employees, especially in regional offices, still lack the necessary competence to operate these electronic systems. Moreover, the general

public still has limited understanding of how to access and utilize digital land certificates, especially in areas with low digital literacy. As such, training and capacity-building programs for ATR/BPN staff are essential to enable them to manage digital systems more effectively. In addition, widespread public outreach is needed to educate communities about the benefits and procedures involved in using digital land certificates. With proper education, the public is expected to be more receptive to the new system and able to utilize it effectively.

Data security is also a crucial issue in the implementation of digital land certificates. As electronic documents that contain sensitive information about land ownership, digital certificates are at high risk of hacking, data manipulation, or personal data breaches. According to Law No. 27 of 2022 on Personal Data Protection, the government is obliged to ensure that the land information system has strong cybersecurity measures to prevent data theft or misuse.

However, to this day, there remain significant concerns that the digital system is vulnerable to cyberattacks that could damage or erase land ownership data on a massive scale. Additionally, the risk of digital document forgery is also a matter of concern, even though electronic certificates are already equipped with digital signatures and encryption systems. To ensure the security of digital land certificates, additional protection mechanisms such as the application of blockchain technology or multi-layer authentication systems are required. With stronger security protocols, the risks of hacking and data misuse can be minimized, thereby enhancing public confidence in the use of digital land certificates.

In addition to technical and regulatory barriers, resistance from the public and stakeholders also constitutes a significant challenge in the implementation of digital land certificates. Many members of the public still feel more comfortable with physical land certificates, as they are perceived to be more tangible and easier to verify. Among notaries and land officials, concerns persist regarding the legal validity of electronic certificates, particularly in the context of land disputes. Some stakeholders are also worried about the potential for misuse of the system by irresponsible individuals. Therefore, effective communication strategies and more intensive public education are necessary to improve understanding and trust in the digital system. The government must proactively conduct outreach to promote the benefits and security of the electronic land certificate system, and provide guidance for citizens throughout the transition from manual to digital systems (Putranto, M. I. D., 2023).

Overall, the implementation of digital land certificates represents a crucial step in the modernization of land administration systems in Indonesia. However, its application continues to face various challenges, including regulatory constraints, limited technological infrastructure, human resource readiness, data security threats, and resistance from the public and stakeholders. To overcome these barriers, several strategic measures can be undertaken, such as regulatory reform to align more closely with digital systems, strengthening of technological infrastructure to ensure system reliability, intensive training for ATR/BPN personnel, and enhanced data protection mechanisms to guard against cyber threats. Additionally, public education plays a vital role in fostering trust in the digital land certificate system. With the right strategies in place, the implementation of digital land certificates is expected to proceed more smoothly and deliver maximum benefits to both the public and the government in establishing a more modern, secure, and transparent land administration system (Mustofa, F. C., 2020).

Strategies and Solutions to Overcome Obstacles in the Digitalization of Land Certificates to Enhance the Efficiency and Security of the Land System in Indonesia

The digitalization of land certificates represents a strategic step in the modernization of land administration in Indonesia. This policy aims to enhance public service efficiency, transparency in land ownership, and document security through an information technology-based system. The implementation of digital land certificates is based on the Minister of ATR/Head of BPN Regulation No. 1 of 2021 regarding Electronic Certificates, which stipulates that digital land certificates will replace the physical documents that have been used thus far. However, this

transformation faces various challenges, such as regulatory unpreparedness, limited technological infrastructure, insufficient human resources (HR) readiness, cybersecurity threats, and resistance from the public and stakeholders. Therefore, effective strategies and solutions are needed to ensure that the digitalization of land certificates can proceed optimally and provide maximum benefits to the public.

One of the main steps in overcoming the obstacles to the digitalization of land certificates is to refine existing regulations and harmonize cross-sector policies. Currently, Law No. 5 of 1960 on the Basic Agrarian Law (UUPA) still adopts a conventional approach to land rights management and does not explicitly regulate the digitalization of land certificates. In addition, Law No. 11 of 2008 on Electronic Information and Transactions (ITE) recognizes electronic documents as legal evidence, but its implementation in the context of land management still requires strengthening. To address this issue, the government needs to revise the UUPA to include provisions related to the digitalization of land certificates and ensure that its derivative regulations comprehensively support the electronic system. Moreover, data security regulations need to be strengthened by referring to Law No. 27 of 2022 on Personal Data Protection, which governs digital data management to prevent misuse by irresponsible parties. Policy harmonization is also needed between central and regional governments to ensure that the implementation of digital land certificates is uniform across Indonesia without regulatory discrepancies that could hinder this system (Farahzita, N., 2022).

The readiness of technological infrastructure is a key factor in the success of land certificate digitalization. Currently, there is a technological access gap between urban and rural areas, where many land offices in rural regions still lack stable internet connections and adequate data storage systems. To overcome this challenge, the government needs to invest in strengthening digital infrastructure, including increasing server capacity, optimizing the national data center, and integrating systems with relevant agencies such as local governments, notaries, and financial institutions. Furthermore, the digital system must be designed with reliability and scalability in mind. One solution that can be applied is the use of cloud computing technology, which enables secure and flexible data storage. This technology can also be combined with blockchain, which is known for its high security and ability to prevent land ownership data falsification. With a strong technological infrastructure in place, the land certification process can be carried out more efficiently, and technical risks such as data loss or system failure can be minimized.

The digitalization of land certificates not only requires technological readiness but also the preparedness of human resources to operate this new system. Many employees at the Ministry of ATR/BPN, particularly in rural areas, lack the skills to manage electronic systems. Therefore, intensive training programs for land administration personnel are necessary to enhance their understanding of digital systems and cybersecurity. In addition to training for civil servants, public education is also crucial. Many landowners, particularly in remote areas, still do not understand how to access and use digital certificates. To address this, the government can conduct periodic socialization through various media, both online and face-to-face, to improve public digital literacy concerning electronic land certificates. With competent human resources and a more informed public, the implementation of digital land certificates is expected to proceed more smoothly and be accepted by various parties.

One of the main challenges in the digitalization of land certificates is the threat of cyber security breaches. As electronic documents containing land ownership information, digital certificates are at risk of becoming targets for hacking or data manipulation. Therefore, the government must ensure that the land information system is secure and adheres to established cyber security standards. One strategy that can be implemented is the use of blockchain technology, which has a decentralized and tamper-resistant recording system. With this technology, every transaction related to land certificates will be permanently and transparently recorded, thus reducing the risk of document forgery. In addition, the digital land certificate system should be equipped with layered authentication, such as the use of digital signatures, as regulated

in Law No. 11 of 2008 on Information and Electronic Transactions (ITE), as well as data encryption to protect information from unauthorized access. The government must also establish a cyber security monitoring center to detect and prevent potential attacks on the digital land system. With strong security measures in place, public trust in digital land certificates can be increased, thereby encouraging more people to confidently use this system (Hidayah, S., Hariyani, 2024).

Another obstacle in the implementation of digital land certificates is resistance from the public and stakeholders, such as notaries and financial institutions. Many parties still feel more comfortable with physical certificates, as they are considered more tangible and easier to verify. To address this, an effective communication strategy is needed to build public trust in the digital certificate system. The government can conduct widespread educational campaigns through various channels, such as social media, television, seminars, and workshops. These campaigns should highlight the benefits of land certificate digitalization, such as easier access, better security, and stronger legal protection. Additionally, the government can offer incentives for those who transition to the digital system, such as lower administrative fees or faster services for users of electronic certificates. A collaborative approach can also be implemented by involving notary associations, banking institutions, and property developers in the transition to the digital system. With support from various stakeholders, resistance to change can be reduced, and the implementation of digital land certificates can proceed more smoothly.

The digitalization of land certificates is a critical step in modernizing Indonesia's land administration system; however, its implementation faces several obstacles, including regulatory unpreparedness, limited infrastructure, insufficient human resource readiness, data security challenges, and public resistance. To address these challenges, strategies that can be implemented include refining regulations, strengthening technological infrastructure, enhancing human resource competencies, improving data security, and intensifying public education. With these strategic steps, it is hoped that the digital land certificate system can operate more effectively, efficiently, and provide broader benefits for the public and the government in creating a more modern, transparent, and secure land system (Prisnawan, A., 2023).

CONCLUSION

The implementation of digital land certificates by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) is a crucial step in modernizing the land administration system in Indonesia. This digitalization aims to enhance public service efficiency, transparency in land ownership, and document security through an information technology-based system. However, its implementation still faces various challenges that must be addressed to ensure the system operates optimally and is accepted by the public and stakeholders. The main obstacles in the implementation of digital land certificates include the unpreparedness of regulations that have not fully supported electronic systems, limited technological infrastructure, particularly in remote areas, insufficient human resources (HR) readiness to manage digital systems, cybersecurity threats that pose risks to data manipulation and hacking, and resistance from the public and stakeholders who are still accustomed to physical certificates.

To overcome these challenges, strategic measures are required, such as refining regulations to make them more adaptive to digital systems, strengthening technological infrastructure to ensure stable and secure services, enhancing HR capacity through intensive training programs, and implementing stricter cybersecurity measures, such as the use of blockchain technology and data encryption. Additionally, socialization and education for the public are key to building trust in the digital land certificate system, ensuring broad acceptance. With the right strategies and collaboration between the government, the public, and other stakeholders, the digitalization of land certificates can be more effective, efficient, and provide greater benefits in creating a modern, transparent, and secure land system.

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