




The Impact of Land Mafia on Agrarian Disputes and the Optimisation of Electronic Land Transfer Deeds in Indonesia

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Abstract

This study analyses the impact of land mafia practices on the increase in agrarian disputes in Indonesia and evaluates the optimisation of electronic land transfer deeds as a policy instrument to strengthen legal certainty. Land mafia practices through certificate forgery, issuance of duplicate documents, manipulation of archives, and collusion with public officials trigger uncertainty regarding rights status, prolong litigation processes, disrupt social stability, and undermine public trust in the legal system. These conditions ultimately impact the investment climate and infrastructure development. This study uses a normative legal method with a legislative, conceptual, case, and comparative approach. Primary legal materials include Law No. 5 of 1960 concerning Basic Agrarian Principles and Regulation of the Minister of Agrarian Affairs and Spatial Planning or Head of the National Land Agency No. 3 of 2023, supported by secondary and tertiary legal materials in the form of academic literature and relevant legal references. The results of the analysis show that document forgery and duplication are the main factors that exacerbate land ownership conflicts. On the other hand, electronic land title deeds have the potential to increase legal certainty through the provision of digital audit trails, increased procedural transparency, and reduced opportunities for forgery. However, their effectiveness is still influenced by challenges in cybersecurity, data synchronisation, infrastructure readiness, and resistance from actors who benefit from the old system. This study emphasises that the optimisation of electronic instruments must be integrated with institutional reform, professional supervision, and community participation in order to effectively suppress land mafia practices.

Keywords: *Land Mafia, Electronic Land Administration, Legal Certainty, Agrarian Law*

INTRODUCTION

Land governance in Indonesia has long been recognised as one of the most sensitive, controversial, and complex aspects of public administration (McCarthy et al., 2022; Meckelburg & Wardana, 2024). Land is not only a physical resource, but also a socio-economic and cultural asset that shapes the lives of individuals, communities, and nations (Jie et al., 2023). The 1960 Basic Agrarian Law (UUPA) established a legal framework to ensure certainty and fairness in land management. However, after more than six decades, the reality of land management is still far from these normative aspirations (Natadireja et al., 2024). Practices in the field are characterised by protracted agrarian conflicts, overlapping ownership claims, and various governance weaknesses that reveal the vulnerability of the state's legal and institutional apparatus (Bah & Dossa, 2025).

The governance weaknesses in question are not only administrative in nature, but also legal and institutional. At the administrative level, problems are evident in the inconsistent quality of data, predominantly formal verification processes, and land rights archives and records that are not yet fully integrated. At the legal and institutional level, problems arise through weak oversight mechanisms, low accountability in land services, and opportunities for collusion in the process of proving and resolving disputes, resulting in a situation that is prone to conflict and difficult to

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recover from quickly.

One of the most worrying manifestations of this vulnerability is the phenomenon known as the land mafia ([Acemoglu et al., 2019](#)). The land mafia is a network of organised actors who exploit regulatory loopholes, bureaucratic weaknesses, and weak oversight to obtain or transfer land rights illegally ([Alting et al., 2025](#); [Bachriadi & Aspinall, 2023](#)). Commonly used methods include forging certificates, issuing duplicate documents, manipulating ownership records, colluding with officials, and abusing the judicial process.

The term 'systematic' in this context refers to a pattern of repeated and coordinated operations, not incidental occurrences. Operations are considered systematic when the same modus operandi appears repeatedly in various locations or times, involves the division of roles between actors (e.g., document collectors, archive access providers, transaction intermediaries, and legalisation facilitators), and exploits the same procedural points, especially in the phases of file verification, data alteration, and formal evidence reinforcement. Such structured operations undermine the integrity of the agrarian legal system by transforming legal documents from instruments of certainty into tools for seizing rights, thereby impacting social stability and the direction of development ([Daniele & Dipoppa, 2023](#)).

The urgency of tackling land mafia is even more apparent when viewed from its social, economic, and political implications. Various reports indicate that the losses caused by the land mafia are enormous and recurring, reflecting the economic burden and inefficiency of governance ([Rahmadi et al., 2024](#)). Uncertainty over land ownership also hinders investment, slows down infrastructure development, and creates instability in the housing and agricultural sectors ([Adelaja & George, 2019](#)). At the social level, the eviction of legitimate owners triggers protests and can lead to clashes. Politically, the persistence of land mafia undermines the legitimacy of the state as the public doubts the government's ability to protect land rights ([Paoli, 2020](#)).

To strengthen the credibility of the argument, the source category referred to as 'various reports' includes publications by government agencies related to land services, records of case handling by law enforcement officials, findings by public service supervisory agencies, relevant court decisions, and reports from civil society organisations that monitor agrarian conflicts. The affirmation of this category of sources is important because it shows that the land mafia is a cross-sectoral issue that is recorded in administrative, judicial, and social channels.

This condition confirms the gap between *das sollen* (the law as it should be) and *das sein* (the law as it is applied). Although the UUPA and its derivative regulations were designed to create legal certainty, the practices of document falsification, bureaucratic inefficiency, and corruption show that implementation is often far from ideal ([Ardiansyah, 2024](#); [Rahayu et al., 2025](#)). Therefore, land mafia is not merely an administrative issue, but a distortion of the principle of agrarian justice that directly impacts citizens' rights. Land mafia practices have even developed into systemic injustices that go beyond service issues. Victims not only lose their land rights but also face lengthy legal processes, economic burdens, and psychological pressure.

The use of false documents and manipulation of the judicial process shows that this issue can drag judicial institutions into a circle of collusion, thereby complicating access to justice ([Hansen, 2023](#); [Hoddy, 2021](#); [Sahlan et al., 2024](#)). On the other hand, academic studies have emphasised the normative aspects of agrarian law, state authority, and the principle of legal certainty, but have not specifically positioned digital technology as an instrument to close the loopholes for manipulation at procedural points that are vulnerable to exploitation ([Calo et al., 2023](#); [Fuad et al., 2023](#); [Meckelburg & Wardana, 2024](#)).

A more specific research gap in this study lies in the question: what actually changes when land administration is digitised, especially in the phase of transfer of rights, which is the main gateway for document manipulation. A number of digital governance studies tend to assess

digitisation in terms of service efficiency, process acceleration, or administrative transparency, but do not sufficiently explain how digital system design responds to the adaptation of organised crime, including how perpetrators exploit the data input, authorisation, and formal verification phases. Thus, the existing literature is insufficient to understand contemporary land mafias that adaptively exploit procedural and technological loopholes.

In this context, electronic land administration has emerged as a potential solution through the digitisation of land documents and records. The government, through the ATR or BPN, has introduced electronic land certificates and electronic-based instruments for the transfer of rights. This innovation is expected to improve data accuracy, reduce the risk of forgery, and simplify administrative procedures.

Technically, the logic of reducing forgery in electronic documents relies on several key features, including authenticated electronic signatures, audit trail logging of every data change, time stamps, authority-based access control mechanisms, and data integration in databases that enable cross-verification of the identity of subjects, objects, and rights history. These features narrow the scope for manipulation because data changes leave traceable traces and do not depend on a single physical document that can be easily duplicated or replaced. However, this digital transformation faces challenges ranging from resistance from parties who benefit from the old system, cybersecurity risks, personal data protection, to digital literacy and access inequalities.

Based on this background, this study has two main objectives. First, this study aims to analyse how land mafia practices shape and exacerbate the dynamics of agrarian conflicts and disputes in Indonesia through document falsification, the issuance of duplicate certificates, manipulation of land archives, and institutional collusion, as well as how these practices impact legal certainty and the level of public trust in the legal system. Second, this study aims to evaluate the extent to which the optimisation of electronic land title deeds can close the loopholes in the land transfer process that have been exploited by land mafia networks, while also identifying the governance and institutional prerequisites necessary for this instrument to function effectively in strengthening legal certainty and suppressing land mafia practices.

This study's contribution is confirmed on two levels. Theoretically, this study expands the debate on agrarian law and governance by placing agrarian crime as an issue of institutional failure that operates at certain procedural points, then testing how digitisation, particularly in the rights transfer phase, can change the configuration of crime opportunities and restore legal certainty. Practically, this study provides a policy basis for refining the design of electronic transfer deed implementation, including strengthening audit trails, integrating data between actors (PPAT, land offices, and related institutions), material verification standards, and designing stricter supervision of the rights transfer phase. Thus, the findings of this study can assist policymakers in closing legal loopholes, strengthening control mechanisms, and designing a more accountable and manipulation-resistant electronic land governance system.

LITERATURE REVIEW

Land Mafia Practices, Legal Uncertainty, and Agrarian Conflicts

Land mafia practices are positioned as the main explanatory variable in this study because they contribute directly to uncertainty regarding land rights and the escalation of agrarian conflicts. Conceptually, the land mafia is understood as a network of organised actors who exploit legal loopholes and administrative weaknesses to obtain or transfer land rights illegally (Paoli, 2019). Common modes include certificate forgery, issuance of duplicate documents, manipulation of land archives, collusion with officials, and abuse of judicial mechanisms (Albanese, 2018). International literature places this phenomenon within the framework of organised crime, which is characterised by role coordination, long-term goals, and the potential involvement of formal actors both within

and outside the state (Fernandes et al., 2024).

Within the framework of legal certainty theory, land mafia undermines the function of land documents as a definite and predictable means of proof, as the status of rights becomes vulnerable to dispute through conflicting documents. From a governance perspective, land mafia indicates institutional failure at three key points, namely verification (quality of material examination), control of data changes (control over record updates), and service accountability (decision trails and oversight). Thus, land mafia is not merely an individual violation, but a symptom of institutional failure that produces legal uncertainty.

Land conflicts and disputes in this study are positioned as dependent variables that arise when uncertainty of rights and overlapping claims become chronic. The literature describes agrarian conflicts as conflicts of interest rooted in uncertainty of rights, overlapping claims, and perceived unfair distribution of land (Boone et al., 2019). In the Indonesian context, KPA reports indicate that agrarian conflicts are largely related to document manipulation and ownership disputes, with cases concentrated in the plantation, property, and National Strategic Projects sectors (KPA, 2023; KPA, 2024).

Rather than repeating the same factors in different sections, this study summarises the dominant causal chain in the literature as follows: land mafia practices exploit weaknesses in data verification and control, resulting in legal uncertainty through conflicting documents, which then triggers repeated conflicts and disputes, especially over land with high economic value due to profit incentives and high competition for claims. This chain also explains why disputes tend to be protracted, as conflicts shift from physical occupation to formal disputes in administrative and judicial spaces.

The impacts of agrarian conflicts are material, social, and political. Conflicts can lead to evictions, loss of livelihoods, and damage to assets, while also triggering psychological trauma and social fragmentation. In the long term, recurring conflicts weaken the legitimacy of the state and undermine public trust in the law (Noor, 2024). Uncertainty of ownership has also been identified as an obstacle to investment and infrastructure development (Ali, 2024).

Electronic Land Administration Policy

Electronic land administration is positioned as a policy variable that can theoretically break this chain by strengthening legal certainty and governance. The Indonesian government, through ATR/BPN, regulates the issuance of electronic documents in land registration through ATR/BPN Ministerial Regulation No. 3 of 2023. Normatively, this policy is aimed at improving data accuracy, expanding administrative transparency, and narrowing the scope for document falsification.

The digitisation of land registration is also in line with global trends that place electronic systems as a means of improving service efficiency, data security, and traceability of information changes (Olnes et al., 2017; Government of India, 2020).

A number of international experiences show a common pattern that integrated and auditable systems tend to make document-based manipulation more difficult. However, the literature also emphasises that digitisation does not automatically resolve conflicts. Its effectiveness depends on the quality of the initial data, institutional design, oversight capacity, and the system's ability to prevent or detect unauthorised data changes.

In other words, digitisation is better understood as a governance infrastructure that strengthens control and traceability, rather than a substitute for institutional reform.

Critical Reflections on International Comparisons

Several international examples are often used to demonstrate the potential of land administration digitisation, such as Rwanda, Estonia, and India. Rwanda, through its land tenure

regularisation programme (LTR), has expanded mass registration and digitisation of records, which has correlated with increased rights certainty and reduced conflict (Ali et al., 2014). Estonia is often cited for its use of technology that emphasises data integrity, including a blockchain-based approach to improve the traceability of information changes (Olmes et al., 2017). India, through the DILRMP, is promoting the modernisation of digital land records, intending to speed up services and reduce document-based fraud (Government of India, 2020).

Although relevant as references, these three cases need to be read critically when applied to the Indonesian context. First, Rwanda's success was supported by mass registration with data restructuring from the outset. This differs from Indonesia, which faces a diverse historical data burden, including overlapping claims and variations in land status, so that digitisation risks replicating old problems if the underlying data is not cleaned up. Second, Estonia has high digital governance capacity and a relatively mature digital identity infrastructure; these conditions are not always comparable to the varying capacities of regions in Indonesia, so the adoption of data integrity technology requires a differentiated implementation strategy. Third, India shows that land record modernisation can improve services, but still faces challenges of cross-regional data harmonisation and inter-institutional interoperability. This is important for Indonesia because the biggest obstacles often occur in data synchronisation, coordination between actors, and procedural consistency.

Thus, the main lesson from international comparisons is not simply that 'digitisation reduces conflict', but rather that the success of digitisation depends on institutional prerequisites and data quality. This study uses these comparisons as an analytical tool to examine what needs to be fulfilled so that Indonesia's electronic land administration policy not only improves service efficiency but also effectively closes the loopholes exploited by land mafia.

Electronic Land Transfer Deeds

Electronic land transfer deeds are positioned as a strategic variable because they are directly related to the critical point of rights transfer, which in practice is often a gateway to manipulation. In the land system, transfer deeds serve as the legal basis for transactions and strengthen evidence. The transformation of deeds from physical to electronic form is expected to increase efficiency, reduce the risk of forgery, and strengthen accountability (ATR/BPN, 2023).

Unlike approaches that focus solely on the issuance of certificates, governance literature shows that the transfer of rights phase is a vulnerable point because it involves verification of the parties' identities, the validity of the object, the history of rights, and authorisation of data changes.

Electronic deeds connected to a national database and equipped with authentication, audit trails, and access controls can narrow the opportunities for forgery and the creation of duplicate documents for the same transaction. However, the effectiveness of electronic deeds is still influenced by cybersecurity, the validity of electronic signatures, infrastructure readiness, and technical capacity gaps (Ali, 2024).

The literature also emphasises that without cross-agency integration and robust digital auditing, digitisation risks becoming a layer of technology on top of fragile governance (Noor, 2024).

Theoretical Framework and Synthesis

This study combines three theoretical foundations. First, legal certainty theory emphasises the importance of clarity, consistency, and predictability of norms to protect legal subjects. Second, the institutional and governance perspective explains that the quality of regulation, bureaucracy, and oversight mechanisms determines the effectiveness of rule enforcement. Third, the routine activity approach in organised crime studies explains that crime occurs when motivated actors

encounter available targets under conditions of weak surveillance.

The literature synthesis in this study is summarised as follows: land mafia practices exploit weaknesses in data verification and control in land administration, resulting in legal uncertainty and overlapping claims, which then trigger repeated conflicts and disputes. Electronic land administration serves as a policy that can strengthen traceability and transparency, but the most decisive point of intervention is in the process of transfer of rights, so that optimising electronic transfer deeds becomes a key instrument for closing the space for manipulation and strengthening legal certainty.

This framework serves as an analytical basis for assessing whether Indonesia's electronic land policy is sufficiently robust in normative and institutional terms to respond to land mafia and suppress agrarian conflicts.

RESEARCH METHOD

This study utilises a normative or doctrinal legal research method that places law as a norm in legislative texts and court decisions (Marzuki, 2017; Ibrahim, 2018). The normative method was chosen because the focus of the research was to evaluate the adequacy of regulatory design and legal protection logic in the digitisation of land administration, especially in the transfer of rights phase, which is prone to manipulation. Thus, the main units of analysis were the norms, procedures, and legal consequences that create or close opportunities for deviation, rather than measuring the performance of service implementation. The empirical method was excluded because this study does not aim to statistically measure the effectiveness of the programme or the behaviour of actors in the field, but rather to assess normatively whether the designed legal and governance frameworks are adequate to strengthen legal certainty and accountability.

The research approach includes legislative, conceptual, case, and comparative approaches. The legislative approach was conducted by analysing Law No. 5 of 1960 concerning Basic Agrarian Principles and related implementing regulations on land registration and electronic documents, specifically Regulation of the Minister of Agrarian Affairs and Spatial Planning or Head of the National Land Agency No. 3 of 2023 concerning the Issuance of Electronic Documents in Land Registration Activities. The conceptual approach is used to examine the doctrines of legal certainty, proof of rights, governance, and administrative accountability.

The case approach is carried out through the analysis of court decisions selected purposively based on three criteria: (1) disputes involving alleged falsification or duplication of land documents and/or administrative manipulation; (2) the dispute relates to the process of transfer or change of land rights, which is relevant to the focus of electronic transfer deeds; and (3) the decision contains the judge's considerations regarding the probative value of documents (e.g. certificates, PPAT deeds, or administrative documents) and registration or data change procedures. The scope of the decisions covers general courts (from district courts to the Supreme Court) for civil disputes and administrative courts (from administrative courts to the Supreme Court) for disputes over administrative land decisions, insofar as they are relevant to the issues of transfer of rights and document evidence. The number of rulings is determined based on analytical sufficiency, i.e. when patterns of evidentiary issues and procedural vulnerabilities have been repeated and are sufficient to build normative conclusions.

To ensure consistent reading of the decisions, this study uses a decision analysis matrix that maps: (a) the type of dispute and procedural vulnerabilities (identity verification, rights history, data changes); (b) the main evidence and its quality; (c) judges' assessment standards for document and procedural validity; (d) the legal consequences of the decision; and (e) the implications of the decision for the design of strengthening electronic land title deeds.

A comparative approach was taken by reviewing the practices of land administration digitisation in Rwanda, Estonia, and India (Ali et al., 2014; Olnes et al., 2017; Government of India, 2020). The three countries were selected because they represent contrasting but relevant models to be tested in the Indonesian context: Rwanda stands out for its basic data reform through mass registration prior to digitisation, Estonia emphasises data integrity and traceability of changes, while India represents large-scale digitisation with the challenge of cross-regional data harmonisation. The comparative framework used is functional and contextual, assessing the function of preventing manipulation (authentication, audit trails, data integration) as well as institutional and technical prerequisites (initial data quality, interoperability, institutional capacity) so that the lessons learned remain realistic for Indonesia.

The legal materials consist of primary materials (laws and regulations, including Permen ATR/Kepala BPN No. 3 of 2023, as well as court decisions), secondary materials (academic literature and journal articles), and tertiary materials (legal dictionaries and encyclopaedias) (Black, 2019). The materials were collected through literature research in academic databases and regulatory and ruling portals so that the search process could be replicated methodologically.

The analysis was conducted normatively and qualitatively through material inventory, legal interpretation, and argument construction. The interpretation was conducted using grammatical, systematic, and teleological methods (Ibrahim, 2018). Grammatical interpretation was used to interpret key terms in electronic documents and the land registration process; systematic interpretation was used to examine the interrelationships between land registration norms, deed verification, official authority, and changes to rights data; while teleological interpretation was used to assess the appropriateness of interpretations in relation to the objectives of the regulation, namely strengthening legal certainty, preventing manipulation, and increasing accountability. When there is potential for conflicting interpretations, the resolution is carried out through the harmonisation of norms and testing the consistency of interpretations with the objectives of the regulation.

To ensure that the evaluation is not descriptive, this study uses normative evaluation criteria to assess the 'effectiveness' of digital policies in a juridical sense, namely the extent to which the policies strengthen legal certainty and reduce opportunities for manipulation in the rights transfer phase. These criteria include: legal certainty, procedural accountability (audit trails and access control), document integrity (authentication and prevention of duplication), data interoperability and consistency, and protection of the rights of bona fide parties. To maintain consistency of interpretation, this study applies source triangulation by comparing primary legal materials, academic analyses, and comparative experiences (Ibrahim, 2018; Budianto, 2022).

FINDINGS AND DISCUSSION

Research Results

Theme 1 – Patterns of Land Mafia Crime and Systemic Vulnerabilities

'The first finding shows that land mafia practices in Indonesia have serious consequences for the state and society, with potential state losses claimed to have been saved reaching around Rp 5.7 trillion throughout 2024' (Arini, 2024). This figure highlights the weakness of state protection mechanisms for land as part of the economic, social, and cultural framework guaranteed by the Constitution (Guzmán et al., 2023; Rojo-Mendoza et al., 2022). Land mafia activities generally involve collusion between corrupt officials and individuals seeking to obtain land rights illegally through organised crime methods, such as falsifying land documents, manipulating court proceedings to obtain recognition of rights, and falsifying deeds or official statements (Bachriadi & Aspinall, 2023).

These findings also identify several structural factors that create an environment conducive to land mafia practices, including: the absence of an integrated land administration system; inconsistent proof of ownership (especially for customary land); weak systematisation of land rights after the expiry of Cultivation Rights (HGU); misuse of the names of notaries or Land Deed Officials (PPAT) who are no longer active; lax land rights policies with minimal supervision; low public legal literacy regarding certificate protection; and unprofessional behaviour by law enforcement officials, exacerbated by weak institutional supervision by the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN).

In particular, the findings confirm that in practice, the National Land Agency conducts more formal verification than material verification, leaving ample room for fraud ([Aziani et al., 2020](#); [Thompson, 2024](#)). In this situation, fake or duplicate certificates are a strong indicator of land mafia crime and trigger ownership disputes that can only be resolved through lengthy litigation in court.

Theme 2 – The Impact of Land Mafia on Agrarian Conflicts and Disputes

The second finding confirms that land mafia cases often go beyond individual disputes and develop into broader social issues ([Alting et al., 2025](#); [Ardiansyah, 2024](#)). In a number of cases, mafia networks attempt to legitimise their claims through fictitious or fabricated civil lawsuits with the support of corrupt officials, resulting in court decisions that deprive the original owners of their rights. This not only highlights systemic corruption, but also shows how legal institutions can be manipulated to institutionalise the deprivation of rights.

The recorded impacts include not only land loss, but also forced evictions, destruction of homes and agricultural land, loss of customary territories, and reduced access to local resources. Vulnerable groups, especially women and children, experience secondary burdens such as loss of shelter, disruption of livelihoods, and psychological trauma. These findings are consistent with data and analysis that place agrarian conflict as an issue that is not only economic in nature, but also touches on dimensions of human rights and social justice.

Theme 3 – The Role and Potential of Electronic Land Administration

The third finding relates to the government's efforts to address these structural vulnerabilities through policies on the digitisation of administration. The Indonesian government is gradually developing electronic-based services, ranging from population administration (e-KTP), traffic law enforcement (e-Tilang), to electronic land certificates (e-Sertifikat) ([Kusmiarto et al., 2021](#); [Mulyadi & Zulkarnaen, 2025](#)). In the land sector, digitisation is promoted as a means to reduce irregularities and strengthen legal certainty.

Based on the UUPA and the mandate of TAP MPR No. IX/MPR/2001, the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) introduced electronic land certificates formalised through ATR/BPN Ministerial Regulation No. 3 of 2023. These electronic certificates have the same legal force as paper certificates, both as proof of ownership and as evidence in court. These digital certificates are equipped with electronic signatures and identities that can be legally verified by accredited providers, so that they are normatively designed to guarantee the authenticity and integrity of the documents ([Sedlmeir et al., 2021](#)).

Digitisation is expected to minimise the risk of forgery, theft, or damage to physical documents ([Khan & Lone, 2021](#)), as well as facilitate access to ownership history and data verification. By consolidating land records into a single electronic system, ATR/BPN has the potential to monitor claims more effectively, reduce overlapping certificates, and strengthen the principles of transparency, accountability, and efficiency ([Jahani Chehrehbargh et al., 2024](#)). The development of applications such as Sentuh Tanahku also strengthens public access to information and facilitates oversight by owners and the wider community.

Theme 4 – Critical Findings: Limitations and Risks of Digitalisation

Despite the potential benefits, the findings also reveal a number of limitations and risks that could create new complexities. First, comparative literature and practices warn of cybersecurity vulnerabilities, data leaks, and the potential misuse of sensitive information in digital systems (Aslan et al., 2023). In the context of organised crime, land mafia networks have the potential to adapt their strategies to exploit weaknesses in electronic systems, for example, by manipulating access credentials or exploiting collusion at data input points.

Second, the transition period from paper-based to electronic systems has the potential to create overlapping administrative regimes, where data on physical certificates, manual archives, and digital databases are not yet fully synchronised. In such situations, digitisation can inadvertently increase the complexity of evidence, as data discrepancies between systems can open up new opportunities for disputes, especially when land mafias exploit these inconsistencies.

Thirdly, there are indications that electronic certificates alone are not always sufficient to prevent disputes if the quality of the initial data migrated to the digital system still contains errors, historical manipulations, or claims that were problematic from the outset. In other words, digitisation does not automatically correct substantive flaws in ownership data that has already been compromised.

Fourth, the findings also highlight the risk of exclusion for groups with limited internet access, digital literacy, or economic capacity to utilise electronic services. This creates a paradox: on the one hand, digitisation is intended to increase transparency; on the other hand, without support and assistance, the system can reinforce access gaps and create new forms of vulnerability.

These findings indicate that although electronic land administration and electronic certificates offer promising solutions, their effectiveness is highly dependent on strengthening cybersecurity, data synchronisation, resolving legacy issues from old systems, and the existence of strong and credible human oversight.

Table 1. Summary of Key Research Findings

Theme	Key Findings Focus	Key Implications
1. Patterns of land mafia crime and systemic vulnerabilities	Land mafia exploits legal loopholes, administrative weaknesses, and formal verification only; losses amount to trillions of rupiah	Demonstrates institutional failure and the collapse of legal certainty in land administration
2. Impact on agrarian conflicts and disputes	Disputes have expanded from individual cases to become social and human rights issues, impacting vulnerable groups	Agrarian conflicts become indicators of structural injustice and the delegitimisation of the state in the eyes of citizens
3. The potential of electronic land administration	Electronic certificates and digital applications improve data accuracy, transparency, and efficiency, supporting good governance	Provides a normative and technical basis for strengthening legal certainty and limiting the scope of mafia activity
4. Limitations and risks of digitisation	Cyber vulnerability, data inconsistency, digital exclusion, and the fact that electronic certificates do not always prevent disputes	Emphasising that digitisation requires human oversight, institutional reform, and improvements to basic data

This table emphasises that digitisation is not a single solution, but part of a broader set of strategies to improve land governance.

Discussion

The discussion section links the above findings to the theoretical framework described in the literature review, particularly the theories of legal certainty, governance, and organised crime perspectives.

First, from the perspective of legal certainty theory, the findings in Theme 1 and Theme 2 show that land mafia practices directly undermine the function of certificates as evidence that should be certain, clear, and reliable. When fake and duplicate certificates circulate, and court decisions are manipulated, legal certainty over land collapses, and creates a situation where legal subjects can no longer predict the legal consequences of their ownership status. This is in line with the view that legal certainty depends not only on the formation of norms, but also on the integrity and reliability of the implementation system.

Second, from a governance and institutional perspective, findings related to structural factors that facilitate land mafia operations, such as weak oversight, formal verification alone, and minimal data integration, reinforce the argument that the land mafia is a symptom of governance failure in the land sector. Electronic land administration policies can be seen as an effort to improve governance through greater transparency, accountability, and data traceability. However, as seen in Theme 4, digitisation that is not supported by institutional reform risks becoming a layer of technology on top of a structure that remains fragile. Third, when viewed through the lens of routine activity theory and organised crime, digitisation can be understood as an attempt to change the configuration of opportunities for perpetrators.

A good electronic system, with strong authentication, audit trails, and integrated data, theoretically reduces opportunities for land mafias to falsify documents or enter fictitious claims. However, findings show that actors can also adapt their strategies, for example, by exploiting cybersecurity vulnerabilities or utilising internal actors with access to the system. Therefore, digitisation changes the landscape of crime opportunities, but does not eliminate the need for human oversight and strict accountability mechanisms. Fourth, comparisons with Rwanda, Estonia, and India show that the success of land administration digitisation is largely determined by the quality of institutional design and consistency of implementation. In Rwanda, mass registration and rights restructuring were combined with a digital system, resulting in relatively clean data entry.

Estonia emphasises data integrity and security through blockchain technology. India is attempting to modernise land records through the DILRMP programme, although it still faces data harmonisation challenges. In comparison, Indonesia is in a transitional phase where digitisation is taking place alongside various historical data issues, unresolved agrarian conflicts, and uneven institutional capacity.

The key lesson from these three cases is not simply that digitisation speeds up services, but that digitisation is effective when built on certain governance prerequisites, notably clean basic data, consistent verification standards, and robust audit mechanisms.

However, the transferability of international practices to Indonesia is not straightforward due to differences in ownership and administrative structures, including variations in land status (e.g., customary land and land with overlapping claim histories), institutional capacity gaps between regions, and the complexity of cross-actor coordination (land offices, PPAT, courts, and other institutions) that affect the quality of data input and changes.

Therefore, the most realistic practice to adopt is not to copy the technology in its entirety, but to transfer its functional principles, namely data refinement prior to migration, strengthening of access control and audit trails, and interoperability design that ensures that every change in

rights during the transfer phase is recorded, traceable, and verifiable through cross-checking.

In other words, this comparison confirms that technology only increases legal certainty when it operates within an institutional framework capable of controlling data quality and decision accountability, so Indonesia's reform agenda must prioritise strengthening governance at critical points of rights transfer, not just expanding the issuance of electronic certificates.

Fifth, the finding that electronic certificates do not always prevent disputes confirms that the root of the problem is often substantial, not merely administrative or technical. If the underlying data is flawed, for example due to historical conflicts, manipulation of rights, or unresolved customary disputes, then transferring the data to an electronic system does not automatically bring about justice.

At this point, the discussion highlights the importance of integrating digital policies with fair and participatory dispute resolution mechanisms. Finally, the discussion emphasises that the digitisation of land administration and the implementation of electronic land certificates are important but not the only elements in a strategy to eradicate the land mafia.

A more comprehensive solution requires a combination of: (1) improving the quality and integrity of basic data, (2) strengthening institutions and law enforcement, (3) improving the legal and digital literacy of the community, and (4) strong supervision by responsible professional actors (notaries, PPATs, and law enforcement officials).

CONCLUSIONS

This study examines land mafia practices in Indonesia and their impact on legal certainty, social stability, and economic development, as well as evaluating the role of electronic land administration in responding to these issues. In response to RQ1, the findings show that land mafia practices through the falsification and duplication of certificates, manipulation of archives, and manipulation of legal processes create uncertainty of rights and exacerbate agrarian conflicts. More than just causing an 'effect', land mafia shapes the dynamics of disputes through a relatively repetitive escalation path: document and data manipulation is used to build counterclaims, which are then legitimised through fictitious transactions or problematic deeds, then reinforced by administrative actions (e.g. changes to records or the issuance of new documents) and, in the final stage, directed to litigation to obtain formal recognition. This process transforms disputes from issues of factual control into lengthy battles of formal proof, thereby increasing costs, prolonging the duration of conflicts, and increasing the opportunities for collusion. This situation not only harms legitimate owners, but also erodes trust in land governance and exacerbates investment risks in the property and infrastructure sectors.

In response to RQ2, this study concludes that the digitisation of land administration is an important reform measure but not a single solution. Normatively, Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency Regulation No. 3 of 2023 provides a framework for the issuance of electronic documents that can strengthen legal certainty through improved traceability, document security, and procedural transparency. In the context of the mafia's modus operandi, electronic certificates have the potential to disrupt practices of forgery and duplication because data changes and document issuance no longer depend on a single physical artefact, but rather on a system that leaves an audit trail, authentication, and timestamp, making paper-based forgery easier to detect and double claims easier to verify administratively. However, the most decisive point of intervention remains in the phase of transfer of rights, so that optimising electronic land transfer deeds becomes a key instrument for closing the main loophole for land mafias, namely the manipulation of transactions and changes to rights data at the time of transfer. Electronic transfer deeds integrated with land databases, accompanied by authentication and access control, have the potential to narrow the scope for fictitious transactions, identity abuse, and

unauthorised data changes.

However, findings also show that technology cannot replace the need for human supervision and institutional reform. Digitalisation built on problematic legacy data, run by institutions with weak controls, or accessed unevenly risks replicating old problems in a new format. Therefore, eradicating land mafia requires a holistic approach that integrates digital reform with institutional strengthening, accountability of key actors (notaries, PPATs, and law enforcement officials), improvement of basic data quality, and community participation.

The theoretical contribution of this research is normative in nature, clarifying how legal certainty theory and institutional perspectives work in the context of organised crime in the land sector, particularly at the procedural point of transfer of rights as a critical space for manipulation. This research emphasises that the collapse of legal certainty is not only related to the quality of written norms, but also to the interaction between procedural design, weaknesses in supervision, and the adaptation of land mafia network strategies.

Actionable policy recommendations from this study include: (1) strengthening material verification in the transfer of rights phase through multi-layered checks on the identities of the parties, the history of rights, and the status of the land object before the data changes are legalised; (2) a programme to cleanse and reconcile legacy data before full migration, including a risk marking mechanism for land parcels with a history of disputes or document inconsistencies; (3) the implementation of audit trail-based oversight with strict access controls and monitoring of high-risk data changes, accompanied by mandatory independent reviews for certain transactions; (4) integration and interoperability of data across key actors, especially between land offices and PPATs, so that electronic transfer deeds do not become a separate process from land verification; and (5) targeted legal and digital literacy initiatives, such as assistance in using electronic services, education on rights status checks, and easily accessible reporting channels for the public.

Thus, this study concludes that the digitisation of land administration and electronic documents is only effective as a long-term strategy against land mafia when combined with data reform, institutional strengthening, and consistent oversight mechanisms, so that technology is used to expand access to agrarian certainty and justice in Indonesia.

LIMITATIONS & FURTHER RESEARCH

Although this study provides a normative legal analysis of land mafia practices and the potential of electronic land administration, several limitations must be acknowledged. First, this study is conceptual in nature and does not include empirical field research, such as interviews or case studies, which could illustrate the practical realities of policy implementation. Second, the scope of this study focuses on national regulations and does not provide an in-depth comparative analysis with other jurisdictions that have successfully adopted digital land administration systems. Third, technological and cybersecurity aspects are only discussed in general terms, so a detailed technical evaluation is beyond the scope of this study.

Future research should go beyond the normative legal framework to include empirical investigations of how electronic certification is implemented at the regional and local levels, including the challenges faced by landowners, officials, and legal practitioners. Comparative studies with other countries that have pioneered electronic land governance would also be useful in identifying lessons that could be applied to Indonesia. In addition, interdisciplinary research combining law, technology, and social sciences is needed to assess the broader implications of digital transformation, particularly issues of data security, inclusivity, and the digital divide. Finally, future literature should also explore the role of civil society and community-based initiatives in preventing land mafia practices, recognising that legal and technological reforms must be complemented by public empowerment and vigilance.

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