



Mechanisms for Preventing and Resolving Agrarian Disputes through the Strengthening of the Land Administration System

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ABSTRACT

*Agrarian disputes in Indonesia remain a fundamental issue because they are directly related to legal certainty, protection of land rights, and the governance of land administration. This study aims to analyze mechanisms for preventing and resolving agrarian disputes through the strengthening of the land administration system. This study uses normative legal research with descriptive analytical specifications and a normative juridical approach. The data consist of secondary data as the main data and primary data as supporting data. Secondary data were obtained through library research on legislation, legal doctrines, journal articles, and other relevant legal materials. Primary data were obtained through limited observation and interviews at land administration institutions. The data were analyzed using a juridical qualitative method. The results show that agrarian disputes are largely triggered by weaknesses in land administration, particularly the inconsistency between physical and juridical data, overlapping land certificates, weak validation of land title documents, suboptimal digitalization of land records, and the inconsistent application of the principle of *contradictoire delimitatie*. This study concludes that the prevention of agrarian disputes should be directed toward strengthening land administration that is accurate, transparent, integrated, digital, and accountable. Such strengthening can be carried out through the digitalization of land records, the updating of cadastral maps, the integration of land databases, strict document validation, and the establishment of a fast and measurable administrative correction mechanism.*

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INTRODUCTION

Land holds a strategic position in Indonesian society because it is directly related to economic rights, legal certainty, social identity, living space, and sustainable development. In the national agrarian legal system, land is not only understood as an object of ownership, but also as a resource that determines people's access to housing, employment, investment, and public services. Therefore, land administration must be able to guarantee certainty regarding the subject of rights, land objects, land parcel boundaries, history of possession, and procedures for the

transfer of rights. Weak land administration can reduce tenure security and increase the risk of conflict, especially when physical data and juridical data are not synchronized (Feder & Nishio, 1998; Deininger & Feder, 2009; Bennett et al., 2008).

Agrarian disputes in Indonesia do not always arise from conflicts of interest between parties. Many disputes emerge because of weaknesses in land administration, such as overlapping certificates, unclear land parcel boundaries, inconsistencies between physical data and juridical data, land title documents that are difficult to verify, and transfers of rights that are not properly recorded. This condition shows that land problems should not be understood merely as ownership conflicts, but also as issues of data governance, legal procedure, and the quality of administrative services. Land certificates do function as strong evidence, but their evidentiary strength may be weakened if the issuance process is not supported by accurate, transparent, and verifiable data (Payne et al., 2009; Sikor & Lund, 2009; Ho & Spoor, 2006).

The urgency of strengthening land administration has increased along with the growing demand for land for housing, infrastructure development, industrial areas, plantations, investment, and strategic projects. This demand increases pressure on space and raises the potential for conflict when land data systems are not managed accurately. In this context, land administration cannot be positioned merely as formal record keeping. Land administration must function as a legal protection system that operates from the stages of surveying, mapping, registration, validation of land title documents, recording of changes in rights, to the updating of spatial data. A sound administrative system will strengthen legal certainty, reduce transaction costs, clarify rights and obligations, and reduce opportunities for data manipulation (Deininger & Feder, 2009; Bennett et al., 2008; Lemmen et al., 2015).

International studies on land administration emphasize that the quality of land administration is closely related to tenure security, economic efficiency, governance, and dispute prevention. Feder and Nishio (1998) show that land registration and certification can provide economic and social benefits when supported by a credible institutional system. Deininger and Feder (2009) emphasize that land registration plays an important role in development, but its effectiveness depends greatly on governance, access costs, and data quality. Bennett, Wallace, and Williamson (2008) also stress the importance of organizing land information to support sustainable land administration. Therefore, the core issue does not lie only in the existence or absence of certificates, but in the quality of the administrative system that produces, stores, and updates land data.

The state of the art in this article lies in the shift of focus from dispute resolution to dispute prevention. Previous studies on agrarian conflict have largely discussed resolution through litigation, mediation, negotiation, agrarian reform, and power relations in land control (Peluso & Lund, 2011; Borras & Franco, 2012; Cotula, 2012; McCarthy et al., 2012). These studies are important because they explain conflict structures, unequal access, and the dynamics of land control. However, the discussion of dispute prevention through the strengthening of land administration still needs to be developed more systematically. This article fills that gap by positioning land administration as a preventive instrument that can close maladministration gaps, improve data validation, and strengthen legal certainty before disputes develop into legal cases.

The novelty of this article lies in the construction of the idea that land administration must be positioned as an active legal system, not merely as a bureaucratic recording mechanism. This approach emphasizes the importance of integrating legal norms, spatial data, juridical data, institutions, digital technology, and the legal culture of society. Within this framework, land

digitalization should not be understood merely as the scanning of physical documents into electronic form. Digitalization must be directed toward building a standardized and interoperable land data system with an audit trail and the ability to update information consistently. The Land Administration Domain Model concept shows that standardizing data on the subject of rights, land objects, legal relationships, spatial boundaries, and transactions is an important requirement in modern land administration (Lemmen et al., 2015). Studies on blockchain and digital records also show that technology can strengthen the integrity of archives when supported by proper governance and a clear legal framework (Lemieux, 2016; Graglia & Mellon, 2018).

However, technological strengthening cannot stand alone. The digitalization of land administration must be supported by clear legal substance, competent institutional structures, and an orderly legal culture within society. Experiences from various countries show that land certification does not always resolve conflicts when the system ignores social claims, communal rights, power relations, and public access to legal procedures (Payne et al., 2009; Sikor & Lund, 2009; Ho & Spoor, 2006). Therefore, land administration reform must be understood as legal and governance reform, not merely technological reform. A digital system without data validation, official supervision, and clear correction procedures may simply transfer old administrative problems into an electronic format.

Based on the discussion above, the main problem in this article is the suboptimal performance of the land administration system in preventing and handling agrarian disputes. This problem can be seen from three aspects. First, the juridical aspect, namely the continued existence of legal uncertainty in the validation of land title documents, proof of physical and juridical data, and correction of administrative data. Second, the technical aspect, namely the uneven integration between spatial data and juridical data, incomplete digitalization of land records, and remaining discrepancies between registration maps and actual conditions in the field. Third, the institutional aspect, namely limited official capacity, weak inter-agency coordination, and suboptimal supervision of land administration services. These three aspects show that agrarian disputes need to be analyzed as legal, administrative, technological, and governance issues in an integrated manner (Bennett et al., 2008; Deininger & Feder, 2009; Lemmen et al., 2015).

Based on this background, this article formulates three research problems. First, how effective is the current land administration system in detecting and preventing potential agrarian disputes? Second, what are the juridical and technical obstacles in strengthening land administration for the prevention and handling of disputes? Third, how can the mechanism for preventing agrarian disputes be reconstructed through the strengthening of a transparent, accountable, and digital technology-based land administration system?

The framework of this article is built on three theoretical foundations. First, Gustav Radbruch's theory of legal certainty is used to analyze the relationship between land administration and the guarantee of certainty over land rights. Legal certainty requires clear norms, procedural certainty, consistent application, and protection of legitimate rights. In the context of land, legal certainty can only be realized if the administration is able to present accurate data on the subject of rights, land objects, land parcel boundaries, and the history of rights transfers. If such data are inaccurate, land administration can create room for multiple claims, overlapping certificates, and boundary disputes (Radbruch, 2006; Deininger & Feder, 2009).

Second, Lawrence M. Friedman's legal system theory is used to examine agrarian disputes through the elements of legal structure, legal substance, and legal culture. Legal structure relates to the capacity of land institutions, land registration officials, survey officers, and supervision mechanisms. Legal substance relates to land registration norms, data validation, proof of rights, electronic certificates, and procedures for correcting data. Legal culture relates to public awareness in registering land, updating data on transfers of rights, respecting land parcel boundaries, and using lawful procedures. These three elements determine whether land administration can prevent disputes or instead generate new problems (Friedman, 1975; Sikor & Lund, 2009).

Third, modern public administration theory is used to analyze the importance of efficiency, transparency, accountability, data integration, and digitalization in land services. Modern public administration requires services that are fast, accurate, open, auditable, and responsive to public needs. In the land sector, these principles require the digitalization of land records, the updating of cadastral maps, the integration of spatial and juridical data, stronger internal supervision, and proportional protection of access to information. Through this approach, strengthening land administration can become a preventive strategy for reducing disputes from the outset (Bennett et al., 2008; Lemmen et al., 2015; Lemieux, 2016).

This article is important because it offers a conceptual construction that the prevention of agrarian disputes must begin with the improvement of the land administration system. Dispute resolution through courts or mediation remains necessary, but such approaches are insufficient if the administrative roots of disputes are not corrected. Therefore, this article positions land administration as a main pillar of agrarian legal certainty. Strengthening an accurate, transparent, digital, and accountable administrative system is expected to close spaces for maladministration, reduce opportunities for data manipulation, strengthen the protection of rights, and promote fairer land governance.

METHODS

This study uses a normative legal research typology. Normative legal research was selected because the main objects of this study are legal norms, legal principles, legal doctrines, and statutory regulations governing land administration and the prevention of agrarian disputes. In normative legal research, law is examined as a set of rules that regulates legal conduct, legal relations, institutional authority, and the legal consequences of state administrative actions. Therefore, this study is not intended to test statistical relationships between variables. Instead, it analyzes the conformity between land law norms, administrative practice, and the need to strengthen dispute prevention mechanisms (Soekanto & Mamudji, 2019; Marzuki, 2017).

The specification of this research is descriptive analytical. The descriptive aspect is used to systematically describe the regulation and implementation of land administration, particularly in land registration, validation of physical and juridical data, management of land records, updating of land parcel maps, and handling of disputes rooted in administrative weaknesses. The analytical aspect is used to assess the relationship between weaknesses in land administration and the emergence of agrarian disputes. With this specification, this study does not only explain the applicable legal norms, but also examines the effectiveness of those norms in supporting legal certainty and preventing land conflicts (Ibrahim, 2006; Marzuki, 2017).

The research approach used is the normative juridical approach. This approach is carried out by examining statutory regulations, legal principles, legal concepts, and legal doctrines relevant to land administration. The main regulations examined include Law Number 5 of 1960 concerning Basic Agrarian Principles, Government Regulation Number 24 of 1997 concerning Land Registration, and technical regulations related to land registration, electronic certificates, land parcel surveying, and land data management. The normative juridical approach is also used to assess whether the existing land administration system is capable of providing legal certainty, preventing overlapping certificates, and closing gaps for maladministration.

The research material focuses on mechanisms for preventing and resolving agrarian disputes through the strengthening of the land administration system. The material includes the regulation of land registration, validation of land title documents, surveying and mapping of land parcels, application of the principle of *contradictoire delimitatie*, digitalization of land records, integration of physical and juridical data, and the authority of land institutions to correct administrative data after disputes occur. The selection of this material is based on the argument that many agrarian disputes are not only caused by conflicts of interest between parties, but also by the weak quality of land data and administrative procedures.

The field research location is the Office of Agrarian Affairs and Spatial Planning/National Land Agency, or ATR/BPN. This location was selected because ATR/BPN has the authority to conduct land registration, land parcel surveying, land record storage, certificate issuance, land data updating, and the handling of land administration problems. In this study, field data are not used to change the nature of the research into purely empirical research. Field data are positioned as supporting data to strengthen the normative analysis of the implementation of land administration practices.

The types of data used consist of secondary data and primary data. Secondary data serve as the main data because this study is normative legal research. Secondary data consist of primary legal materials, secondary legal materials, and tertiary legal materials. Primary legal materials include statutory regulations in the fields of agrarian law and land administration, such as Law Number 5 of 1960, Government Regulation Number 24 of 1997, and technical regulations governing land registration and electronic land services. Secondary legal materials include agrarian law books, journal articles, research findings, expert opinions, and scholarly literature on land administration, legal certainty, land digitalization, and agrarian disputes. Tertiary legal materials include legal dictionaries, legal encyclopedias, regulatory indexes, and other supporting sources that help explain the legal concepts used in this study (Soekanto & Mamudji, 2019; Ibrahim, 2006).

Primary data are used as supporting data. Primary data were obtained through limited observation and interviews within ATR/BPN. Observation was conducted to directly examine the process of land administration services, particularly those related to land registration, document examination, surveying, mapping, and data updating. Interviews were conducted to obtain confirmation regarding technical and juridical obstacles that arise in the practice of land administration. Relevant informants include structural officials, survey officers, administrative officers, or other parties with competence in land administration services. The use of primary data is complementary so that the normative analysis remains connected to the reality of administrative implementation in the field.

Data collection techniques consist of library research and field research. Library research was conducted by examining statutory regulations, books, journal articles, legal doctrines, court decisions, and official documents related to agrarian disputes and land administration. This technique serves as the main data collection technique because the study focuses on normative legal analysis. Field research was conducted on a limited basis to obtain supporting data regarding land administration practices. Field research was carried out through observation and interviews using structured guidelines so that the data obtained remained aligned with the research focus. In qualitative research, interviews and observations can be used to understand processes, meanings, and institutional practice contexts that are not always visible in written documents (Creswell & Creswell, 2018).

The data collection instruments used consist of document study, observation guidelines, and interview guidelines. Document study was used to identify legal norms, legal principles, legal concepts, and land administration policies. Observation guidelines were used to record land service processes and potential administrative obstacles that arise in practice. Interview guidelines were used to obtain explanations from informants regarding data validation, land parcel surveying, digitalization of land records, handling of overlapping certificates, and obstacles in the implementation of land administration. If necessary, a simple questionnaire may be used as a supporting instrument to obtain additional information, but it is not used as the main instrument for quantitative analysis.

Data processing was carried out through selection, classification, systematization, and interpretation. Selection was conducted to identify data relevant to the research problems. Classification was carried out by grouping data based on the research issues, namely the effectiveness of land administration, juridical and technical obstacles, and the reconstruction of dispute prevention mechanisms. Systematization was conducted by arranging legal materials and supporting data into a logical analytical structure. Interpretation was carried out by interpreting legal norms, doctrines, and field data in an integrated manner to answer the research problems.

Data analysis was conducted using a juridical qualitative method. Juridical analysis was used to assess the conformity between land law norms, legal principles, institutional authority, and land administration practices. Qualitative analysis was used because the data were not analyzed statistically, but through legal reasoning, systematic interpretation, and conceptual argumentation. At this stage, primary legal materials, secondary legal materials, tertiary legal materials, and supporting primary data were analyzed to identify the relationship between weaknesses in land administration and the emergence of agrarian disputes. The results of the analysis were then used to formulate a construction of dispute prevention based on the strengthening of land administration that is more accurate, transparent, digital, and accountable. Qualitative analysis in legal research is important because it enables researchers to understand norms, contexts, and practices in depth without reducing legal issues into mere numbers (Miles et al., 2014; Creswell & Creswell, 2018).

RESULTS AND DISCUSSION

Inventory of Agrarian Dispute Case Data

The inventory of legal materials, literature studies, limited observations, and supporting interviews within land administration institutions shows that agrarian disputes are closely related to weaknesses in land administration. This finding indicates that land disputes do not always originate from independent social conflicts. They often arise because land data are incomplete,

outdated, unintegrated, or inconsistent with physical conditions in the field. In this context, land administration holds a strategic position. If land administration is carried out accurately, transparently, and verifiably, the potential for disputes can be reduced. Conversely, weak administration can produce legal uncertainty.

The case inventory in this study is not intended to calculate the number of cases statistically. It aims to classify patterns of disputes based on their administrative root causes. This approach is consistent with the nature of normative legal research, which uses primary data as supporting data and places legal materials as the main basis of analysis. Based on the inventory, the typology of agrarian disputes related to weaknesses in land administration can be presented as follows.

Table 1. Typology of Agrarian Disputes Based on Administrative Root Causes and Juridical Impacts

No.	Typology of Dispute Cases	Administrative Root Causes	Juridical Impacts
1	Overlapping certificates	Inaccurate physical data, outdated registration maps, old survey documents that have not been digitized, and land parcel plotting that still relies on manual methods	Two or more parties may hold certificates or land title documents over the same land object
2	Boundary disputes over land parcels	Surveys are not accompanied by boundary approval from adjoining landowners, boundary markers are missing, and the principle of <i>contradictoire delimitatie</i> is not consistently applied	Boundary claims, civil lawsuits, or applications for annulment of land administration products may arise
3	Claims over customary land or state land	Zoning, history of possession, and parcel maps are not clearly documented	Conflicts may arise among customary communities, permit holders, business entities, or the government
4	Unregistered transfer of rights	Informal sale and purchase transactions, unregistered inheritance, and changes in the subject of rights that are not updated in the land book	Juridical data in land administration do not correspond to physical possession in the field
5	Forgery or misuse of land title documents	Weak validation of land records, old documents that are difficult to verify, and suboptimal administrative supervision	Administrative products may be issued and later disputed or annulled
6	Certificates issued over problematic land objects	Land history is not examined comprehensively, spatial data and juridical data are not connected, and inter-agency coordination is weak	Lawsuits for certificate annulment and disputes over administrative authority may arise

These findings show a consistent pattern. The root of disputes does not only lie in conflicts of interest between parties, but also in the weak quality of data and administrative procedures. This finding is consistent with Feder and Nishio's (1998) view that land registration provides social and economic benefits only when the supporting system is credible. Deininger

and Feder (2009) also emphasize that land registration affects tenure security, but its effectiveness depends on governance, access, costs, and data quality. Therefore, land certificates should not be understood only as the final product of administration. They must be seen as the result of legal and technical processes whose validity can be tested.

Effectiveness of the Land Administration System in Detecting and Preventing Disputes

The first research problem concerns the effectiveness of the land administration system in detecting and preventing potential agrarian disputes. Based on juridical qualitative analysis, Indonesia's land administration system has a normative foundation through Law Number 5 of 1960 concerning Basic Agrarian Principles and Government Regulation Number 24 of 1997 concerning Land Registration. Normatively, land registration aims to provide legal certainty and legal protection to rights holders. However, the effectiveness of this objective still faces problems when physical data and juridical data are not fully accurate, complete, and integrated.

Juridically, Indonesia's land registration system is often understood as a negative publication system with positive tendencies. This means that a certificate serves as strong evidence, but it is not absolute. A certificate can still be challenged if another party can prove its rights based on valid evidence. This construction has important consequences. On the one hand, it provides room to correct administrative errors. On the other hand, it shows that the state does not fully guarantee the material truth of all data recorded in certificates. This condition can create legal uncertainty when the registration process is not supported by strong data validation.

The first scientific finding of this study is that the effectiveness of land administration depends greatly on the quality of integration between physical data and juridical data. Physical data include location, boundaries, area, and land parcel maps. Juridical data include the status of rights, the subject of rights, history of transfer, and legal encumbrances over land. If these two types of data are not synchronized, the administrative system cannot detect potential disputes from the outset. This explains why overlapping certificate disputes often occur in areas that still use old registration maps, analog land records, and survey data that are not yet connected to a digital spatial system. Bennett, Wallace, and Williamson (2008) emphasize that the organization of land information is an important requirement for sustainable land administration. Lemmen, Van Oosterom, and Bennett (2015) also show that data standardization in the Land Administration Domain Model is important for consistently linking subjects, objects, rights, boundaries, and land transactions.

From the perspective of Gustav Radbruch's theory of legal certainty, this condition shows that legal certainty cannot be built solely through written norms. Legal certainty requires accurate administrative data, accountable procedures, and consistent legal application. If a certificate is issued based on inaccurate data, legal certainty becomes weak. A certificate that should provide protection may instead become the object of dispute. Therefore, land administration must be positioned as part of the mechanism of legal certainty, not merely as a technical recording activity.

This finding is also consistent with Payne, Durand-Lasserve, and Rakodi's (2009) study, which shows that land certification does not always solve the issue of tenure security if the system does not consider social context, access procedures, and administrative quality. Sikor and Lund (2009) also emphasize that access to and ownership of land are related to authority and power relations. Therefore, administrative recognition must be supported by social and institutional legitimacy. Thus, the effectiveness of land administration is not determined only by the number

of certificates issued, but also by the quality of verification, data transparency, information updating, and correction mechanisms for administrative errors.

Juridical and Technical Obstacles in Strengthening Land Administration

The second research problem concerns juridical and technical obstacles in strengthening the land administration system. Based on the analysis, these obstacles can be examined through Lawrence M. Friedman's legal system theory, namely legal substance, legal structure, and legal culture. These three elements are interrelated. Weakness in one element can disrupt the effectiveness of the others.

From the aspect of legal substance, the main obstacle lies in the suboptimal regulation of comprehensive land data validation. Several old land title documents, such as girik, petok, Letter C, old sale and purchase deeds, land history statements, and inheritance documents, are often used as the basis of claims in disputes. Problems arise when these documents have not been digitized, are difficult to verify, or do not have a clear connection with land parcel maps. In such circumstances, land officials face difficulties in ensuring the relationship among documents, the subject of rights, and the land object. This can open space for administrative errors and document manipulation. Ho and Spoor (2006) show that land certification in transitional societies can create problems when the formalization of rights does not align with actual patterns of possession. This means that written law must be supported by verification mechanisms capable of reading the social and administrative history of land possession.

From the aspect of legal structure, obstacles arise in institutional capacity, human resources, supervision, and inter-agency coordination. Land administration requires surveyors, land registration officials, data managers, and document examiners who possess technical competence and strong integrity. Limited capacity may result in shallow document examination, inaccurate surveys, and suboptimal supervision of administrative processes. This problem becomes more complex when land data must be linked to spatial planning data, licensing, forestry, regional assets, and customary community claims. Deininger and Feder (2009) emphasize that institutional quality strongly determines the success of a land registration system. Without strong institutions, land registration may fail to provide tenure security.

From the aspect of legal culture, obstacles can be seen in the low awareness of some members of society in updating land data. Changes resulting from informal sale and purchase transactions, inheritance, grants, parcel subdivision, parcel consolidation, or boundary changes are often not registered immediately. As a result, juridical data in the land book do not correspond to physical possession in the field. This inconsistency becomes a source of disputes because the party who physically controls the land is not always recorded as the rights holder in land administration. Sikor and Lund (2009) explain that access to land is always related to recognized authority. In this context, administrative compliance requires not only rules and institutions, but also public awareness to use legal procedures correctly.

The second scientific finding of this study is that agrarian disputes tend to arise when legal substance, legal structure, and legal culture do not work simultaneously. Regulations may formally govern land registration, but disputes may still occur if officials cannot verify documents, maps are outdated, and the public does not update land data. Conversely, digital technology will also be ineffective if legal norms remain unclear and legal culture remains permissive toward informal transactions. Therefore, strengthening land administration must be carried out systemically. Reform cannot rely only on changes in service applications. It must

include regulatory reform, improvement of institutional capacity, updating of spatial data, and legal education for the public.

Reconstruction of Dispute Prevention Mechanisms Based on Modern Land Administration

The third research problem concerns the reconstruction of agrarian dispute prevention mechanisms based on the strengthening of land administration. Based on the analysis, dispute prevention must be carried out by establishing an integrated, transparent, digital, and accountable land administration system. This reconstruction should not be understood merely as a technical shift from physical documents to electronic documents. It must address the way the state produces, verifies, stores, updates, and corrects land data.

The third scientific finding of this study is that the most relevant dispute prevention mechanism is the integration of physical data and juridical data into one land administration system. This system must allow every change in the subject of rights, status of rights, boundaries, land area, and legal encumbrances to be recorded consistently. If juridical data change, spatial data must also be updated. If subdivision, consolidation, or transfer of rights occurs, the system must be able to trace the history of those changes through an audit trail. Thus, potential overlapping certificates, differences in land area, and multiple claims can be detected earlier.

From the perspective of modern public administration, the land system must fulfill the principles of efficiency, accountability, transparency, traceability, and responsiveness. The digitalization of land records is an important initial step, but it is not sufficient. Digitalization must be accompanied by revalidation of old documents, updating of cadastral maps, cross-sector data integration, and correction mechanisms when errors are found. Lemmen, Van Oosterom, and Bennett (2015) emphasize the importance of a land administration data model that can link parties, rights, objects, and spatial units. Bennett, Wallace, and Williamson (2008) also emphasize that land information must be organized to support sustainable land administration.

The use of technology such as land information systems, digital cadastral maps, electronic certificates, and digital transaction records can strengthen data integrity. However, this technology must be placed within a clear legal framework. Lemieux (2016) states that blockchain or digital recording technology can support trust in records if it is designed with proper governance. Graglia and Mellon (2018) also explain that blockchain technology can be used in property recording, but its implementation requires institutional design, initial data validation, and clear legal responsibility. Therefore, technology should not be understood as an automatic solution. Technology is useful only when the initial data are accurate, validation procedures are strong, and the managing institution is accountable.

The reconstruction of dispute prevention mechanisms in this study can be formulated into five steps. First, validate and digitize all land records, especially old documents that are often used as the basis of claims. Second, update land parcel maps based on precise coordinates and connect them with juridical data. Third, strengthen the application of the principle of *contradictoire delimitatie* by requiring boundary approval from adjoining parties before registration or data changes are carried out. Fourth, build an early warning system for potential overlapping land parcels through the integration of registration maps, history of rights, and transaction data. Fifth, establish a fast, transparent, and supervisable administrative correction mechanism when data errors are found.

This reconstruction must also consider conflicts related to customary land, state land, and areas with complex histories of social possession. Peluso and Lund (2011) show that land conflicts are often related to the formation of authority and control over space. Borrás and Franco (2012), Cotula (2012), and McCarthy, Vel, and Afiff (2012) also show that land control in the context of development and investment may generate conflict when community access, history of possession, and social legitimacy are ignored. Therefore, a modern land administration system cannot be merely technically accurate. It must also be sensitive to social claims, customary community rights, and the principle of agrarian justice.

Thus, the findings of this study show that the prevention of agrarian disputes cannot rely solely on settlement mechanisms after conflicts occur. Prevention must be built from the upstream level through strong land administration. Strong land administration must be able to ensure data quality, procedural consistency, institutional integrity, information transparency, and accessible correction mechanisms. If these elements are fulfilled, the land administration system can function as an instrument of legal certainty and dispute prevention.

Answers to the Research Problems

Based on the analysis above, the answer to the first research problem is that the current land administration system already has a legal basis for providing certainty of rights. However, its effectiveness in detecting and preventing disputes remains suboptimal. The main weaknesses lie in the inconsistency between physical data and juridical data, incomplete digitalization of land records, outdated parcel maps, and weak document validation mechanisms.

The answer to the second research problem is that the obstacles to strengthening land administration include juridical, technical, institutional, and legal culture obstacles. Juridical obstacles arise from data validation regulations that do not yet fully address the complexity of old documents and social claims. Technical obstacles arise from limited integration between spatial and juridical data. Institutional obstacles arise from the capacity of officials, supervision, and coordination. Legal culture obstacles arise from the low level of public administrative compliance in updating land data.

The answer to the third research problem is that the reconstruction of dispute prevention mechanisms must be directed toward strengthening modern land administration that integrates physical data, juridical data, spatial data, and transaction history into an auditable system. This reconstruction must include the digitalization of land records, updating of cadastral maps, revalidation of documents, application of the principle of *contradictoire delimitatie*, an early warning system for overlapping land parcels, and a fast administrative correction mechanism. Through this model, land administration can function as a preventive instrument in realizing agrarian legal certainty.

CONCLUSION

Based on the research findings and analysis, agrarian disputes are not rooted solely in conflicting claims over land rights, but also in the vulnerability of a land administration system that has not yet become fully accurate, integrated, and up to date. The inconsistency between physical and juridical data, weak validation of land title documents, incomplete digitalization of land records, and suboptimal updating of land parcel maps are administrative factors that may trigger overlapping certificates, boundary disputes, multiple claims, and lawsuits against land administration products. The findings show that land administration has a strategic function as

an instrument for dispute prevention. It should not be understood merely as a formal recording mechanism, but as a legal protection system that operates from surveying, mapping, verification of land title documents, land registration, recording of changes in rights, to data correction. Therefore, the prevention of agrarian disputes must begin with the strengthening of land administration as an upstream instrument. An accurate, transparent, integrated, digital, and accountable land administration system can reduce the risk of maladministration, strengthen the protection of land rights, and minimize the recurrence of agrarian disputes.

The strengthening of land administration requires concrete and systematic reforms. The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency needs to accelerate the national digitalization of land records while ensuring substantive validation of old documents, including verification of document authenticity, conformity of juridical and spatial data, and linkage with land parcel maps. The government also needs to strengthen land data integration through a national cadastral system that connects physical data, juridical data, spatial planning data, licensing data, and land transaction history, supported by audit mechanisms, data change logs, and an early warning system for overlapping land parcels. Regulatory reform is also needed, particularly through the evaluation and updating of Government Regulation Number 24 of 1997, so that land registration rules better accommodate electronic certificates, digital land record validation, administrative data correction, official responsibility, land data protection, and sanctions for verification negligence. In addition, ATR/BPN must strengthen the application of the principle of *contradictoire delimitatie* in land surveying and first-time registration, establish a fast and transparent administrative dispute resolution mechanism, and encourage public compliance in registering transfers of rights, updating inheritance data, recording lawful sale and purchase transactions, installing boundary markers, and reporting changes in land data. These reforms are necessary to build a comprehensive land administration system that strengthens legal certainty and prevents agrarian disputes in a sustainable manner.

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