How to cite item: Ramadhan, Rahmat Fauzi, Nur Hidayani Alimuddin, and Irsan Rahman. "Digital Certificate Mapping (Plotting) and Its Legal Impact on Agrarian Reform Acceleration in Kolaka Regencys." *Jurnal Cakrawala Hukum* 16 no. 2 (2025): 151-170. DOI: 10.26905/idjch.v16i2.15223.

Jurnal Cakrawala Hukum

Volume 16 Issue 2, 2025
P-ISSN: 2356-4962, **E-ISSN**: 2598-6538

Digital Certificate Mapping (Plotting) and Its Legal Impact on Agrarian Reform Acceleration in Kolaka Regency

Rahmat Fauzi Ramadhan[1], Nur Hidayani Alimuddin[2], Irsan Rahman[3].
Faculty of law, University of Sembilan belas November, Kolaka, Indonesia.

Article history:
Received 2025-06-01
Received 2025-07-23
Accepted 2025-08-01

Keywords:
Digital Certificate Mapping; Plotting Agrarian Reform; Legal Certainty; Kolaka Regency Land Office.

DOI:
doi.org/10.26905/idjch.v16i2.15223.

Corresponding Author:
Rahmat Fauzi Ramadhan
E-mail: rahmatfauziramdhan@gmail.com.

Abstract: Land disputes and the structural deficiency of Indonesia's land administration system have persisted as fundamental obstacles to the realization of agrarian justice. Digital certificate mapping (plotting), mandated by Ministry of ATR/BPN Circular Number 13/SE/XII/2017, represents a pivotal policy instrument designed to establish spatial legal certainty over registered land rights and to accelerate the national agrarian reform programme. This research examines the implementation of plotting at the Kolaka Regency Land Office, Sulawesi Tenggara, and critically analyses its impact on the acceleration of agrarian reform through a socio-legal approach integrating statutory analysis with primary field data. The findings reveal that plotting, when correctly implemented, contributes substantially to spatial legal certainty by detecting overlapping certificates and producing georeferenced digital parcel records through the SIPETIK system. However, empirical evidence from documented cases including a certificate location mismatch affecting Ny. Harmiani (SHM No. 00614) and an unauthorized plotting case in Okoko Village exposes systemic deficits in technical capacity, institutional accountability, and community engagement that undermine the system's effectiveness for the most vulnerable rights holders. This research concludes that the transformative potential of digital plotting for agrarian reform is contingent upon coordinated investment in licensed cadastral surveyor capacity, institutional transparency mechanisms, and systematic community socialization conditions that remain structurally underdeveloped in the Eastern Indonesian land administration context.

1. Introduction

Land, in the intellectual landscape of Indonesian law, is far more than a physical resource. It is the substratum of sovereignty, the foundation of identity, and in the constitutional architecture of the Indonesian state a social good whose governance is an obligation of justice. Article 33 paragraph (3) of the 1945 Constitution of the Republic of Indonesia establishes the normative anchor: land, water, and natural resources are to be controlled by the state and utilized for the greatest prosperity of the people. This constitutional mandate was operationalized through Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA), a landmark legislative instrument that

brought into being a unified national agrarian framework premised on three foundational values nationalism, socialism, and democratic governance over land.[1] Yet, sixty-five years after its enactment, the distance between the UUPA's normative ideals and the empirical reality of Indonesian land governance remains profoundly troubling.

Indonesia's agrarian landscape is fractured by persistent inequality, endemic conflict, and structural deficiencies in land administration that have proved resistant to decades of reform efforts. Access to land in Indonesia has long been shaped by colonial legacies of dispossession and institutional inertia, in which indigenous and marginalized communities continue to bear the disproportionate burden of insecure tenure.[2] The data are unambiguous in their gravity: according to the Consortium for Agrarian Reform (KPA), from 2005 to 2022, Indonesia recorded no fewer than 4,009 structural agrarian conflicts spanning 11.4 million hectares of land and affecting approximately 2.4 million people.[3] These figures are not merely statistical abstractions; they represent millions of households caught in a perpetual condition of legal uncertainty unable to invest in their land, vulnerable to arbitrary dispossession, and excluded from the formal mechanisms of economic life. The central pathology of this crisis is identifiable: the absence of an accurate, comprehensive, and legally certain system of land registration.

Land registration is not a bureaucratic formality. It is, as Article 19 paragraph (1) of the UUPA expressly mandates, the fundamental instrument through which the state fulfils its constitutional obligation to provide legal certainty over land rights. Legal certainty in this context understood in the Kelsenian sense as the predictability of legal consequences arising from clearly established norms requires that the identity of the rights holder, the precise boundaries of the land parcel, and the legal nature of the title all be verifiable, documented, and immune from arbitrary challenge.[4] The land certificate, issued at the conclusion of the registration process under Government Regulation Number 24 of 1997 concerning Land Registration, functions as strong evidence of ownership. Nevertheless, Indonesia's adoption of the negative registration system with a positive tendency rather than a fully constitutive positive system means that even a lawfully issued certificate does not carry absolute legal finality and may be challenged where procedural irregularities or evidentiary defects can be demonstrated.[5]

This structural ambiguity in the registration system has produced a well-documented and deeply damaging phenomenon: the proliferation of overlapping and multiple certificates over the same parcel of land. Such overlaps occur not only through fraudulent manipulation but also, and perhaps more insidiously, through accumulated errors in manual physical measurement, outdated base maps, inconsistent data recording, and the absence of cross-validation mechanisms between offices.[6] When a citizen holds a certificate for land whose coordinates, boundaries, and legal at-

---

1 Budianto Eldist Noor et al., "Bridging the Gap by Exploring Inequalities in Access to Land and Disparities in Agrarian Law in Indonesia," *Jurnal Ilmu Komputer dan Hukum* 5, no. 1 (2024): 1–14, https://doi.org/10.19184/jik.v5i1.47416.

2 Ibid.

3 Indro Budiono et al., "Internalization Free, Prior, and Informed Consent as Indigenous Alienation Resistance in Structural Agrarian Conflict," *Jurnal Cakrawala Hukum* 14, no. 3 (2023): 220–231, https://doi.org/10.26905/idjch.v14i3.11486.

4 Rezeki Aldila Rajab, Bambang Eko Turisno, and Anggita Doramia Lumbanraja, "Certificate of Land Rights in the Legal Certainty of Land Registration," *Masalah-Masalah Hukum* 13, no. 2 (2020): 642–654, https://doi.org/10.14710/nts.v13i2.31085.

5 Arie Lestario and Erlina Erlina, "Land Registration System that Provides Legal Protection for Land Rights Certificate Holders in Indonesia," *Notary Law Journal* 1, no. 1 (2022): 1–30, https://doi.org/10.32801/nolaj.v1i1.1.

6 Baiq Rika Septiana Wardani, "Legal Consequences of the Issuance of Overlapping Certificates in the Complete Systematic Land Registration Program," *Journal of Notarial Minutes* 4, no. 1 (2023): 97–115, https://doi.org/10.29303/risalahkenotariatan.v4i1.90.

tributes are not accurately mapped and digitally validated in the state's registration system, the certificate offers only nominal rather than substantive legal protection. The certificate becomes, in practice, a document of uncertain value vulnerable to competing claims, administrative error, and opportunistic abuse by individuals within the land administration system itself.

It is precisely against this backdrop of structural vulnerability that the policy of digital certificate mapping widely known as *plotting* must be understood and evaluated. The *plotting* mechanism, introduced through Ministry of ATR/BPN Circular Number 13/SE/XII/2017 and technically regulated by Ministerial Regulation Number 33 of 2016 concerning Licensed Cadastral Surveyors, mandates that every certificate presented for land service transactions must first be validated by tracing its physical location against the digital registration base map maintained in the BPN's KKP system using GPS technology. The *plotting* process effectively demands that the spatial data encoded in a certificate the shape, dimensions, boundary coordinates, and georeferenced location of the parcel correspond accurately to the physical parcel on the ground. It constitutes, therefore, a spatial audit of the certificate's legal integrity.[7]

The transformation of land administration through digital technology represents one of the defining policy priorities of the Indonesian state in the contemporary period. The Ministry of ATR/BPN's digital transformation agenda, accelerated following Presidential instructions to digitalize all land services and operationalized through Ministerial Regulation Number 1 of 2021 concerning Electronic Certificates, reflects a broader recognition that the analogue infrastructure of the past is structurally incapable of resolving the scale of the land administration crisis.[8] Digital transformation in land services, when properly implemented, offers the prospect of integrating spatial and juridical data in real time, enabling cross-validation across administrative levels, eliminating manual data entry errors, and providing citizens with transparent, accessible, and authoritative information about their land rights. Electronic certificates, moreover, carry enhanced technical security features that reduce the risk of forgery, which has historically been a significant mechanism of land fraud in Indonesia.[9]

Yet the promise of digital transformation must be measured against the conditions of its implementation, particularly in regions where the structural prerequisites for effective digital governance reliable infrastructure, adequate human resources, and informed communities remain unevenly distributed. Eastern Indonesia has been underserved by both academic scholarship and policy attention in land administration research. The dominant narrative of Indonesia's land digitalization success draws heavily on experience from Java, where Kabupaten Madiun, Kabupaten Karanganyar, and Kabupaten Pasuruan have achieved high levels of digital cadastral completion. The conditions of implementation, and the legal consequences of partial or flawed digitalization, in non-Javanese regions such as Sulawesi Tenggara have received markedly less critical examination.[10]

---

7 Mashita Amalia Razak, Farida Patittingi, and Maskun Maskun, "Digital Certificate Mapping (Plotting) in Providing Legal Certainty for Land Rights," *Petisi* 8, no. 2 (2020): 143–156, https://doi.org/10.36090/jh.v8i2.818.

8 Irwan Santosa and Endang Purwaningsih, "Analysis of the Implementation of Digital Transformation of Land Certificates in Era 4.0," *Surya Kencana Dua* 9, no. 1 (2022): 16–24, https://doi.org/10.32493/skd.v9i1.y2022.22496

9 Hashfi Maulana et al., "The Urgency of Electronic Certificates with AI-Based Monitoring for Land Registration Efficiency and Land Mafia Mitigation in Indonesia," *Journal of Customary Law* 2, no. 1 (2024): 1–15, https://doi.org/10.47134/jcl.v2i1.3304.

10 Erick Ricardo and Achmad Faishal, "Government Policy in Overcoming Land Problems in the Era of Digitalization and Its Implementation of the Duties and Functions of Notaries," *Das Sollen Law Journal* 10, no. 1 (2024): 1–17, https://doi.org/10.32520/das-sollen.v10i1.3409.

Kabupaten Kolaka, located in Sulawesi Tenggara Province, offers a strategically important research context precisely because it sits at the intersection of high agrarian reform ambition and structurally constrained implementation capacity. The Kolaka Regency Land Office has been tasked with executing the national agenda of *plotting* as a prerequisite for all land certification services, while simultaneously confronting the realities of limited licensed cadastral surveyor capacity, uneven technological infrastructure, and communities whose engagement with formal land registration processes remains incomplete. The role of Licensed Cadastral Surveyors (LCS), who are central to the *plotting* process, has been identified in existing scholarship as both an accelerant of agrarian reform and a potential source of accountability gaps where professional oversight is weak.[11] The agrarian reform program, operationalized through the Agrarian Reform Task Force (GTRA) and focused on asset legalization and community access reform, depends critically on the integrity of the underlying digital mapping system.[12]

Existing scholarship on digital *plotting* has addressed its normative basis and general legal significance for land title certainty.[13] Studies on the electronic certificate policy have examined its potential to modernize land services and enhance fraud resistance.[14] Research on the Complete Systematic Land Registration program (PTSL) has documented both the accelerative effect of systematic registration on agrarian reform and the unresolved tensions between speed and accuracy in cadastral data collection.[15] The role of spatial and GIS technology in improving land governance has been analyzed at the national level.[16] However, a critical lacuna persists in the existing literature: there is no empirical socio-legal study that examines, from a case-based field research perspective at district level, how the *plotting* mechanism operates in a region of constrained implementation capacity, what concrete legal consequences arise from implementation failures, and how these failures implicate the normative principle of legal certainty mandated by the UUPA. Studies to date have largely addressed *plotting* either as an abstract normative matter or as a macro-level policy phenomenon, without grounding the analysis in the specific documented experiences of land rights holders whose legal certainty has been either secured or compromised by the system's operation.

This research fills that gap. It departs from the prevailing approach in two respects that together constitute its novelty: first, it subjects the *plotting* mechanism to a socio-legal analysis anchored in documented empirical cases including the case of Ny. Harmiani (Sertipikat Hak Milik No. 00614, Induha Village) and the unauthorized *plotting* case in Okoko Village, Pomalaa District in which the gap between the normative promise and empirical performance of digital *plotting* is made visible at the level of the individual rights holder. Second, it locates this analysis within the specific and underexamined regional context of Kabupaten Kolaka in Sulawesi Tenggara, thereby

---

11 Ratrianto, Fauzan Murdapa, and Ratna Widyawati, "The Role of Licensed Surveyors in Accelerating Land Registration in Indonesia," *Jurnal Rekayasa Lampung* 1, no. 1 (2022): 45–58.

12 Farah Ananda Resti and Harvini Wulansari, "The Role of the Agrarian Reform Task Force in Creating an Agrarian Reform Village," *Tunas Agraria* 5, no. 2 (2022): 94–110, https://doi.org/10.31292/jta.v5i2.178.

13 Razak, Patittingi, and Maskun, "Digital Certificate Mapping," 143.

14 Imam Sukadi et al., "Legal Politics Electronic Land Certificate in Indonesia," *Jurnal USM Law Review* 7, no. 3 (2024): 1323–1338, https://doi.org/10.26623/julr.v7i3.9625.

15 M. Japar et al., "Analysis of Community Readiness in Implementing the Electronic Land Certification Program: A Review of Legal Sociology," *Jurnal Ilmu Hukum* 7, no. 1 (2024): 81–90, https://doi.org/10.32493/rjih.v7i1.43502.

16 Riswan Erfa, "Digitalization of Land Administration to Realize Accelerated National Development from a Legal Policy Perspective," *Jurnal Pertanahan* 10, no. 1 (2020): 1–15, https://doi.org/10.53686/jp.v10i1.31.

contributing to a more geographically inclusive understanding of how digital agrarian governance performs across the diverse institutional landscapes of the Indonesian archipelago. In doing so, this research seeks to advance scholarly understanding of the conditions under which digital transformation in land administration can, and cannot, deliver the legal certainty that its normative mandate requires.

This article addresses two central research questions: first, how is digital certificate mapping (*plotting*) implemented in the context of accelerating agrarian reform at the Kolaka Regency Land Office?; and second, what impact does digital certificate mapping (*plotting*) have on the acceleration of agrarian reform at the Kolaka Regency Land Office? The answers to these questions are pursued through an empirical-normative socio-legal methodology, integrating statutory and doctrinal analysis with primary field data collected at the Kolaka Regency Land Office, and evaluated against the substantive requirements of legal certainty under Indonesian agrarian law.

2. Method

This research employs a socio-legal research design, which integrates normative legal analysis with empirical field investigation. The socio-legal approach is chosen because the research problem cannot be resolved through doctrinal analysis alone: while the normative framework governing *plotting* and agrarian reform is well-established in statutory and regulatory instruments, the question of its *effectiveness* and the gap between its legal promise and its operational reality is fundamentally an empirical question that demands direct engagement with field data.[17] This methodological duality reflects the dual nature of the research questions, which simultaneously interrogate the normative architecture of *plotting* and the concrete outcomes it produces for individual land rights holders in Kabupaten Kolaka.

The normative dimension of this research employs the statutory approach and the conceptual approach. The statutory approach involves systematic examination and analysis of the hierarchy of legal instruments governing land registration and digital *plotting* in Indonesia, including Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA), Government Regulation Number 24 of 1997 concerning Land Registration, Ministerial Regulation of ATR/BPN Number 33 of 2016 concerning Licensed Cadastral Surveyors, and Ministry of ATR/BPN Circular Number 13/SE/XII/2017 concerning *Plotting*. These primary legal materials are analysed to establish the normative standards against which the empirical implementation of *plotting* at the Kolaka Regency Land Office is evaluated.[18] The conceptual approach involves engagement with the foundational legal doctrines particularly the theory of legal certainty, the principle of negative cadastre with positive tendency, and the principle of *alat bukti yang kuat* that constitute the theoretical framework for evaluating the legal adequacy of the *plotting* system.[19]

---

[17] Dayan Hakim Sitompul et al., "Empirical Legal Investigation of Land Disputes: The Case of Rantau Pandan, Bungo Regency," *Al-Manhaj: Jurnal Hukum dan Pranata Sosial Islam* 6, no. 1 (2024): 65–74, https://doi.org/10.37680/almanhaj.v6i1.4484.

[18] Nanik Kurniati and Efa L. Fakhriah, "Strengthening Land Registration System through Implementation of Domain Approach in Manifesting Legal Certainty and Community Justice," *Sosiohumaniora* 23, no. 3 (2021): 261–270, https://doi.org/10.24198/sosiohumaniora.v23i3.32579.

[19] Rezeki Aldila Rajab, Bambang Eko Turisno, and Anggita Doramia Lumbanraja, "Certificate of Land Rights in the Legal Certainty of Land Registration," *Masalah-Masalah Hukum* 13, no. 2 (2020): 642–654, https://doi.org/10.14710/nts.v13i2.31085.

The empirical dimension of this research is grounded in primary data collection conducted at the Kolaka Regency Land Office, Sulawesi Tenggara Province. Primary data were collected through semi-structured interviews with key informants selected purposively on the basis of their direct involvement in or authoritative knowledge of the *plotting* process and the agrarian reform programme in Kolaka Regency. The informants included officials of the Kolaka Regency Land Office responsible for the implementation of *plotting* and certificate services, Licensed Cadastral Surveyors (Surveyor Kadaster Berlisensi/SKB) operating in the Kolaka Regency service area, the Village Head of Okoko Village, Pomalaa District, whose testimony documented a case of unauthorized *plotting* conducted without the land owner's knowledge, and land rights holders directly affected by implementation outcomes, including the case of Ny. Harmiani involving Sertipikat Hak Milik No. 00614, Induha Village, Latambaga District.[20] This purposive sampling strategy selecting informants based on their direct relevance to the research phenomena rather than on statistical representativeness is consistent with the qualitative epistemological orientation of this research, which seeks depth of understanding rather than breadth of generalization.[21]

Secondary data were drawn from three categories of sources. First, primary legal materials, consisting of the statutory and regulatory instruments identified above, as well as Presidential Regulation Number 86 of 2018 concerning Agrarian Reform and relevant BPN/ATR administrative circulars and technical guidelines. Second, secondary legal materials, comprising peer-reviewed journal articles, academic monographs on Indonesian agrarian law and land administration, and relevant judicial decisions concerning overlapping certificates and *plotting*-related disputes. Third, tertiary legal materials, including official reports from the Kolaka Regency Land Office, administrative data from the BPN's KKP system concerning the progress of *plotting* and certificate issuance in Kolaka Regency, and reports of the Consortium for Agrarian Reform (KPA) documenting the national landscape of agrarian conflict.[21] The integration of these three categories of legal materials enables a multi-dimensional analysis that situates the specific findings from Kolaka within the broader normative and empirical context of Indonesian land administration.

Data collection was conducted through three complementary techniques: (1) in-depth semi-structured interviews with the key informants identified above, guided by an interview protocol developed in advance and adjusted iteratively in response to emergent themes; (2) direct observation of the physical environment of the Kolaka Regency Land Office and its administrative processes, enabling assessment of the infrastructural and human resource conditions that shape *plotting* implementation; and (3) documentary analysis, involving systematic review and coding of official records, BPN administrative documents, and statistical data on land registration and *plotting* completion rates in Kolaka Regency.[22] This triangulated data collection strategy is designed to ensure that findings are corroborated across multiple independent sources of evidence, thereby enhancing the validity and reliability of the empirical analysis.[23]

---

[20] Mashita Amalia Razak, Farida Patittingi, and Maskun Maskun, "Digital Certificate Mapping (Plotting) in Providing Legal Certainty for Land Rights," *Petisi* 8, no. 2 (2020): 143–156, https://doi.org/10.36090/jh.v8i2.818.

[21] Indro Budiono et al., "Internalization Free, Prior, and Informed Consent as Indigenous Alienation Resistance in Structural Agrarian Conflict," *Jurnal Cakrawala Hukum* 14, no. 3 (2023): 220–231, https://doi.org/10.26905/idjch.v14i3.11486.

[22] Arie Lestario and Erlina Erlina, "Land Registration System that Provides Legal Protection for Land Rights Certificate Holders in Indonesia," *Notary Law Journal* 1, no. 1 (2022): 1–30, https://doi.org/10.32801/nolaj.v1i1.1

[23] Baiq Rika Septiana Wardani, "Legal Consequences of the Issuance of Overlapping Certificates in the Complete Systematic Land Registration Program," *Journal of Notarial Minutes* 4, no. 1 (2023): 97–115, https://doi.org/10.29303/risalahkenotariatan.v4i1.90.

The collected data were analysed using qualitative descriptive-analytical methods. In the normative dimension, legal materials are analysed interpretively and systematically to identify the normative standards applicable to *plotting* implementation and to construct a doctrinal framework for evaluating the implementation findings. In the empirical dimension, interview transcripts and observational data are analysed thematically, with themes derived from both the research questions (deductive coding) and the emergent content of informant testimony (inductive coding). Documentary data are analysed through content analysis, focusing on institutional performance indicators, process records, and evidence of implementation gaps. The findings from the normative and empirical analytical streams are then integrated through a *synchronisation analysis*, examining the degree of correspondence between the normative requirements of the *plotting* system and the observed conditions of its implementation in Kolaka Regency, and identifying the legal consequences of implementation deficiencies for the substantive legal certainty of land rights holders.[24]

3. Implementation of Digital Certificate Mapping (Plotting) in Accelerating Agrarian Reform at the Kolaka Regency Land Office

The normative foundation upon which digital certificate mapping (*plotting*) rests in Indonesia is both clear in its mandate and ambitious in its reach. Article 19 paragraph (1) of Law Number 5 of 1960 concerning Basic Agrarian Principles (UUPA) places upon the state an unambiguous constitutional obligation: to carry out land registration throughout the national territory as the instrument for securing legal certainty over land rights. This obligation is not merely procedural; it is substantive in its demand that the land registration system produce certainty not only about who holds a title, but about where precisely the titled land is located, what its exact dimensions are, and whether it is free from competing legal claims.[25] Yet for decades, the analogue architecture of Indonesia's land administration system manual measurements, paper-based land books, handwritten *Surat Ukur*, and registry maps that were never systematically updated produced a landscape of registered land whose spatial identity was often uncertain, inaccurate, and frequently contested. The transition to digital *plotting* is, in this light, not merely an administrative modernization but a belated fulfilment of a normative mandate that has existed since 1960.

The legal framework governing *plotting* is constructed across three principal regulatory instruments. Ministerial Regulation of ATR/BPN Number 33 of 2016 concerning Licensed Cadastral Surveyors introduces the institutional mechanism through which *plotting* is conducted: it mandates that the measurement and mapping results of land parcels must be capable of being mapped onto the Registration Base Map, must correspond in shape and dimension to the actual field conditions, must allow for field reconstruction of boundaries, and must not overlap in whole or in part with the results of prior surveys and mapping.[26] Ministry of ATR/BPN Circular Number 13/SE/

[24] Irwan Santosa and Endang Purwaningsih, "Analysis of the Implementation of Digital Transformation of Land Certificates in Era 4.0," *Surya Kencana Dua* 9, no. 1 (2022): 16–24, https://doi.org/10.32493/skd.v9i1.y2022.22496.

[25] Nanik Kurniati and Efa L. Fakhriah, "Strengthening Land Registration System through Implementation of Domain Approach in Manifesting Legal Certainty and Community Justice," *Sosiohumaniora* 23, no. 3 (2021): 261–270, https://doi.org/10.24198/sosiohumaniora.v23i3.32579.

[26] Eko Budi Wahyono, "Implementation of Regulations on Licensed Cadastral Surveyors to Accelerate Land Registration at the Regional Office of the North Sumatra Provincial Land Agency," *BHUMI: Agrarian and Land Journal* 3, no. 2 (2017): 217–231, https://doi.org/10.31292/JB.V3I2.125.

XII/2017 elevated *plotting* from an internal technical guideline to a mandatory prerequisite for all land service transactions: from that point, no application for certification, transfer of rights, or land service processing could proceed at any Land Office in Indonesia without the certificate in question having first been *plotted* that is, spatially validated and georeferenced against the digital base map maintained in the BPN's Komputerisasi Kegiatan Pertanahan (KKP) system. This regulatory elevation was a decisive policy signal: the Indonesian state acknowledged that a land certificate whose spatial identity could not be verified in the digital system was a certificate whose legal content could not be trusted.[27] Government Regulation Number 24 of 1997 concerning Land Registration provides the overarching framework for the registration activities within which *plotting* is embedded, requiring that land data be organized to be simple, safe, affordable, current, and open to the public principles that digital transformation is designed to serve and strengthen.[28]

At the Kolaka Regency Land Office, the implementation of *plotting* follows a staged operational process that the field research conducted for this study identified as comprising seven interdependent phases. Understanding each phase is essential not merely for descriptive purposes but because failures at any single phase propagate legal consequences that materialize at the end of the chain in the quality of the certificate issued and the strength of the legal protection it affords to the rights holder.

The first phase is regional planning and prioritization. Before *plotting* activities are conducted, the Kolaka Regency Land Office determines, in coordination with the regional government, the specific areas to be prioritized for digital mapping. Priority is given to land parcels that are candidates for certification under the Complete Systematic Land Registration program (PTSL), as well as to parcels that have been identified through the KKP system as not yet mapped, spatially ambiguous, or potentially overlapping. This planning phase is legally significant because it determines whose land will receive the protection of spatial validation and whose will remain in the zone of unresolved uncertainty. The field findings confirm that the planning process in Kolaka Regency has not yet achieved comprehensive territorial coverage: large portions of the regency's land area, particularly in inland and hilly sub-districts, remain outside the planned mapping perimeter a structural gap whose legal implications for the rights holders of unmapped land are serious and underappreciated.[29]

The second phase involves the assignment of Licensed Cadastral Surveyors (Surveyor Kadaster Berlisensi/SKB). Under Ministerial Regulation Number 33 of 2016, the *plotting* process must be conducted by surveyors who hold a professional licence issued by the Ministry of ATR/BPN, are bound by a professional code of ethics, and are accountable for the accuracy of the spatial data they produce. The SKB function as the primary technical agents of legal certainty in the *plotting* system: it is their measurements, their georeferencing, and their digital data inputs that determine whether a certificate's spatial identity is correctly established in the KKP system. The field findings reveal a critical structural deficit at this phase in Kolaka Regency: the number of SKB licensed and

[27] Mashita Amalia Razak, Farida Patittingi, and Maskun Maskun, "Digital Certificate Mapping (Plotting) in Providing Legal Certainty for Land Rights," *Petisi* 8, no. 2 (2020): 143–156, https://doi.org/10.36090/jh.v8i2.818.

[28] Sisca Anindiya Rachmawati, "Land Registration System Revolution Through Complete Systematic Land Registration Program (PTSL) Field Study in Bantul Village," *Legal Institutions* 3, no. 1 (2021): 105–106, https://doi.org/10.37631/widyapranata.v3i1.273.

[29] Budianto Eldist Noor et al., "Bridging the Gap by Exploring Inequalities in Access to Land and Disparities in Agrarian Law in Indonesia," *Jurnal Ilmu Komputer dan Hukum* 5, no. 1 (2024): 1–14, https://doi.org/10.19184/jik.v5i1.47416.

operational in the regency is insufficient relative to the volume of land parcels requiring *plotting*, creating a bottleneck that directly constrains the pace of agrarian reform implementation.[30] This insufficiency of professional cadaster capacity is not unique to Kolaka; it has been identified in the broader Indonesian literature as a systemic weakness in the national *plotting* programme, reflecting both the underdevelopment of the professional licence market and the institutional barriers to entry for prospective surveyors in regions with limited economic incentives.[31]

The third phase is field data collection, conducted by the assigned SKB using GPS instruments and other measuring tools. At this phase, the physical data of each land parcel the coordinate points of its boundary corners, its dimensions, its area, and the spatial relationship of its boundaries to neighbouring parcels and natural or built landmarks are measured and recorded in the field. Simultaneously, juridical data relevant to the parcel the identity of the rights holder, the nature of the right, the certificate number, and the conditions of the right are confirmed against the existing certificate and land book records. The accuracy of this phase is foundational: errors in GPS coordinate recording, imprecision in boundary marking, or discrepancies between field conditions and the certificate's physical data description, if not identified and resolved at this stage, will be inscribed into the digital system and will constitute the permanent spatial identity of the parcel within the KKP database. The negative registration system with positive tendency adopted by Indonesia means that a certificate, once plotted and integrated into the digital system, carries a presumption of correctness that can be displaced only by proof of procedural error a burden that, in practice, is extremely difficult for ordinary citizens to discharge.[32]

The fourth phase is data entry into the SIPETIK application (*Sistem Pendaftaran Tanah secara Elektronik*/Electronic Land Registration System). Following the completion of field measurements, the SKB inputs all collected physical and juridical data into the SIPETIK application the digital platform that integrates land registration data across the national BPN network and constitutes the operational core of Indonesia's digital land administration system. SIPETIK serves as the point of convergence between spatial data (the geographic coordinates and dimensions of the land parcel) and juridical data (the legal identity and rights attributes of the certificate), creating a unified digital record whose integrity is dependent on the accuracy of both data streams and the reliability of the data entry process. The field research found that SIPETIK data entry in Kolaka Regency is subject to practical constraints including intermittent connectivity in outlying sub-districts, inconsistencies in the quality of coordinate data passed from field instruments to the application interface, and critically the absence of a systematic pre-entry quality control mechanism to identify and flag discrepancies before they are inscribed in the permanent record.[33] These operational vulnerabilities are consequential: SIPETIK is the system that generates the digital base map against which all subsequent *plotting* validations are conducted, and errors inscribed at the data entry phase become the reference standard against which future spatial audits are calibrated.

---

30 Ratrianto, Fauzan Murdapa, and Ratna Widyawati, "The Role of Licensed Surveyors in Accelerating Land Registration in Indonesia," *Jurnal Rekayasa Lampung* 1, no. 1 (2022): 45–58.

31 Eko Budi Wahyono, "Implementation of Regulations on Licensed Cadastral Surveyors to Accelerate Land Registration," *BHUMI* 3, no. 2 (2017): 217–231, https://doi.org/10.31292/JB.V3I2.125.

32 Arie Lestario and Erlina Erlina, "Land Registration System that Provides Legal Protection for Land Rights Certificate Holders in Indonesia," *Notary Law Journal* 1, no. 1 (2022): 1–30, https://doi.org/10.32801/nolaj.v1i1.1.

33 Irwan Santosa and Endang Purwaningsih, "Analysis of the Implementation of Digital Transformation of Land Certificates in Era 4.0," *Surya Kencana Dua* 9, no. 1 (2022): 16–24, https://doi.org/10.32493/skd.v9i1.y2022.22496.

The fifth phase is digital mapping and spatial verification. Once the field data are entered into SIPETIK, a digital map of the plotted parcel is generated within the KKP system, depicting the parcel's georeferenced location, shape, and boundaries in relation to adjacent parcels and the broader cadastral fabric of the area. This digital map serves two legal functions simultaneously: it is both the record of the parcel's spatial identity and the reference point against which future *plotting* validations will test the consistency of that identity. The KKP digital map is therefore the legal artefact through which the normative principle of legal certainty certainty about the object of the right is given spatial expression. When the digital map is accurate, it is a powerful instrument of legal protection; when it is inaccurate, it is, paradoxically, an instrument through which legal uncertainty is formally encoded and institutionalized. The field evidence from Kolaka Regency most acutely illustrated by the case of certificate holder Ny. Harmiani demonstrates that the latter risk is not merely theoretical.[34]

The case of Ny. Harmiani, holder of Sertipikat Hak Milik No. 00614 over a 5,032 m² vacant parcel in Rt 01 Rw 02, Induha Village, Latambaga District, Kolaka Regency, constitutes one of the most instructive empirical demonstrations of the gap between the normative promise of *plotting* and its operational performance. When Ny. Harmiani used the ATR/BPN *Touch My Land* mobile application to verify the location of her parcel, the application displayed her certificate as located in RT 2 RW 2 of Induha Village not at RT 01 RW 02 where the land physically stands and where the certificate's physical data records it as being situated. The mismatch is not a trivial administrative irregularity; it is a failure of the spatial validation mechanism at its core. The *plotting* record in the KKP system assigns Ny. Harmiani's certificate to a location that does not correspond to the physical land she owns. This means that the digital system the very instrument through which legal certainty is supposed to be produced instead reflects and perpetuates spatial error. The certificate's legal content (the identity of the rights holder and the nature of the right) may be correct, but its spatial content (the location and boundaries of the land) is digitally falsified in the registration base map. Under Indonesia's negative registration system with positive tendency, this creates a condition of profound legal insecurity: Ny. Harmiani holds a certificate that is legally valid on its face, but whose *plotted* spatial identity is incorrect leaving her vulnerable to competing claims grounded in the erroneous digital record.[35]

The sixth phase is data validation and conflict resolution. Following the creation of the digital map, the *plotting* system requires that the recorded data be validated through cross-verification with existing administrative records and subjected to spatial overlap analysis to identify potential conflicts with adjacent or overlapping parcels. This validation phase is the system's principal quality assurance mechanism and represents the point at which errors inscribed in earlier phases have their last structured opportunity to be detected and corrected before the certificate enters the permanent record. The field findings in Kolaka Regency indicate that this validation phase operates with significant limitations: the cross-verification process is not always conducted with the rigour that its legal significance demands, particularly in the context of the pressure to accelerate certifica-

[34] Rezeki Aldila Rajab, Bambang Eko Turisno, and Anggita Doramia Lumbanraja, "Certificate of Land Rights in the Legal Certainty of Land Registration," *Masalah-Masalah Hukum* 13, no. 2 (2020): 642–654, https://doi.org/10.14710/nts.v13i2.31085.

[35] Baiq Rika Septiana Wardani, "Legal Consequences of the Issuance of Overlapping Certificates in the Complete Systematic Land Registration Program," *Journal of Notarial Minutes* 4, no. 1 (2023): 97–115, https://doi.org/10.29303/risalahkenotariatan.v4i1.90.

tion processing under PTSL targets; the overlap analysis is constrained by the incompleteness of the digital base map, which means that in areas where prior *plotting* records are sparse or absent, the absence of a conflict flag does not reliably indicate the absence of a conflict; and the institutional mechanisms for resolving identified discrepancies which require coordination between the Land Office, the regional government, and affected rights holders are slow and under-resourced relative to the volume of cases requiring resolution.[36]

The most serious failure in the validation phase documented by this research is not a case of data error but a case of deliberate abuse: the unauthorized *plotting* case in Okoko Village, Pomalaa District, Kolaka Regency. In this case, a parcel of land that was legally owned by residents of Okoko Village on the basis of prior occupancy and customary evidence but had not been formally registered in the BPN system, was *plotted* by an individual with connections to the Land Office and a certificate was issued in that individual's name, without the knowledge or consent of the legal owner and without any legitimate basis for the allocation of rights. The Village Head of Okoko Village's testimony, obtained during field research, revealed that the perpetrator had exploited the structural vulnerability that unregistered land creates within the *plotting* system: because the parcel had no prior *plotting* record in the KKP database, its spatial domain was effectively unclaimed in the digital system, allowing a certificate to be issued on the basis of a *plotting* record that misrepresented both the spatial identity and the legal ownership of the land.[37] This case exposes a critical contradiction at the heart of the *plotting* policy: the same digital system that is designed to prevent unauthorized claims on registered land creates, in the domain of unregistered land, a window of institutional opportunity for administrative fraud. The legal owner's absence from the digital system a consequence of incomplete land registration coverage, not of any failing on the owner's part is weaponized against them by actors who control the *plotting* process.

This case is analytically significant not only as evidence of individual misconduct but as evidence of a systemic accountability gap. The *plotting* mechanism, as designed, operates on the assumption that the SKB and Land Office officials who execute the process do so with professional integrity and in conformity with the legal and ethical standards prescribed by Ministerial Regulation Number 33 of 2016. When that assumption is violated when the technical agents of legal certainty become the instruments of legal dispossession the victims are precisely the most vulnerable rights holders: those whose land has not been formally registered, whose knowledge of digital administrative processes is limited, and whose capacity to challenge fraudulent certificates through formal legal mechanisms is constrained. Progressive agrarian law, as a normative framework that demands affirmative action to address structural inequality in land access, requires that the digital *plotting* system be designed with mechanisms of accountability and community participation that are robust enough to protect unregistered land holders as well as registered ones.[38]

The seventh and final phase is the issuance of the land certificate. Only after the data validation process has been completed and no unresolved spatial conflicts remain should the formal certificate be issued. The certificate marks the legal conclusion of the *plotting* process and, in prin-

---

[36] Erwan Mukhlis et al., "Implementation of the Complete Systematic Land Registration Program in Aceh, Indonesia," *Otoritas: Jurnal Ilmu Pemerintahan* 11, no. 2 (2021): 143–159, https://doi.org/10.26618/ojip.v11i2.4156.

[37] Indro Budiono et al., "Internalization Free, Prior, and Informed Consent as Indigenous Alienation Resistance in Structural Agrarian Conflict," *Jurnal Cakrawala Hukum* 14, no. 3 (2023): 220–231, https://doi.org/10.26905/idjch.v14i3.11486.

[38] Siti Malikhatun Badriyah et al., "Progressive Agrarian Law as a Concept to Attain Social Justice," *Pandecta Research Law Journal* 17, no. 1 (2022): 95–108, https://doi.org/10.15294/pandecta.v17i1.34022.

ciple, represents the point at which the state's obligation to provide legal certainty over land rights has been fulfilled for the particular parcel. In practice, however, the field evidence from Kolaka Regency demonstrates that the normative completeness of the certificate issuance phase depends entirely on the quality of the preceding six phases. A certificate issued on the basis of accurate field measurement, reliable SIPETIK data entry, rigorous spatial validation, and the genuine fulfilment of the state's cadastral obligations does indeed represent a meaningful advance in legal certainty for its holder. A certificate issued on the basis of erroneous, incomplete, or fraudulently generated *plotting* data whatever its formal legal validity represents not the achievement of legal certainty but the institutionalization of legal uncertainty in documentary form.[39]

The structural obstacles that constrain effective *plotting* implementation in Kolaka Regency can be organized into three interlocking categories that the field research identified as mutually reinforcing. The first is the deficit of technical and institutional capacity: the limited number of licensed SKB in the regency, the insufficiency of up-to-date digital base map coverage for large portions of the regency's territory, the connectivity and hardware constraints that affect reliable SIPETIK data entry from remote survey locations, and the under-resourcing of the validation and quality control functions at the Kolaka Regency Land Office. This capacity deficit is not merely an operational inconvenience; it has direct legal consequences for the rights holders of the estimated tens of thousands of parcels in Kolaka Regency that remain unplotted and therefore outside the domain of the legal protection that *plotting* is designed to provide. The digital transformation of land services in Indonesia, as a comprehensive readiness assessment has demonstrated, proceeds unevenly across the national territory, with resource-constrained and geographically dispersed offices in Eastern Indonesia facing structural implementation conditions that are categorically different from those prevailing in the well-resourced and densely mapped offices of Java.[40]

The second category is the deficit of community knowledge and engagement. The field research found widespread unfamiliarity among landholders in Kolaka Regency particularly in rural and peri-urban sub-districts with the *plotting* system, its legal significance, and its implications for their land rights. This unfamiliarity manifests in two distinct ways that together reinforce the legal vulnerability of unregistered rights holders. On one hand, landholders who do not know that their land must be *plotted* as a prerequisite for certification do not seek out the process, leaving their land outside the formal registration system and, as the Okoko Village case illustrates, potentially exposed to opportunistic appropriation. On the other hand, landholders who have received certificates but do not know how to use verification tools such as *Touch My Land* to check the accuracy of their *plotting* data cannot identify errors in their spatial record before those errors cause legal harm. The electronic certificate system, as several studies have noted, requires not only institutional preparedness but community readiness an informed public that understands the legal significance of digital land documentation and is capable of exercising the verification rights that the system nominally provides.[41]

---

[39] Erick Ricardo and Achmad Faishal, "Government Policy in Overcoming Land Problems in the Era of Digitalization and Its Implementation of the Duties and Functions of Notaries," *Das Sollen Law Journal* 10, no. 1 (2024): 1–17, https://doi.org/10.32520/das-sollen.v10i1.3409

[40] M. Japar et al., "Analysis of Community Readiness in Implementing the Electronic Land Certification Program: A Review of Legal Sociology," *Jurnal Ilmu Hukum* 7, no. 1 (2024): 81–90, https://doi.org/10.32493/rjih.v7i1.43502.

[41] Hashfi Maulana et al., "The Urgency of Electronic Certificates with AI-Based Monitoring for Land Registration Efficiency and Land Mafia Mitigation in Indonesia," *Journal of Customary Law* 2, no. 1 (2024): 1–15, https://doi.org/10.47134/jcl.v2i1.3304.

The third category is the accountability deficit within the *plotting* system itself. The Okoko Village case reveals that the institutional mechanisms for detecting and sanctioning unauthorized or fraudulent *plotting* the internal oversight functions of the Land Office, the professional accountability mechanisms for SKB, the community notification requirements for *plotting* activities in a given area are insufficient to prevent abuse by actors with institutional access to the *plotting* system. This accountability deficit is not simply a matter of individual misconduct; it reflects a systemic design weakness in a process whose legal consequences are so significant and whose technical complexity is such that ordinary rights holders have no practical capacity to verify whether the *plotting* conducted on their land has been executed correctly, honestly, and in conformity with the standards prescribed by law. Addressing this weakness demands not only stronger internal oversight and professional disciplinary mechanisms but also the development of community-facing transparency tools that make *plotting* data accessible, verifiable, and contestable by the rights holders whose legal security depends upon it.[42]

The analysis of *plotting* implementation at the Kolaka Regency Land Office thus yields a finding that is simultaneously affirmative and cautionary. The *plotting* system, in its normative design and its best operational performance, represents a genuinely significant instrument for advancing the constitutional mandate of legal certainty over land rights. When it functions as designed with accurate field measurement by professionally accountable SKB, reliable SIPETIK data entry, rigorous spatial validation, and transparent certificate issuance it fulfils the state's obligation to make the spatial identity of land rights visible, verifiable, and secure. But the evidence from Kolaka Regency demonstrates that the distance between this normative ideal and the operational reality of *plotting* in a resource-constrained, geographically dispersed, and institutionally under-supervised context is substantial. The policy implication is not that *plotting* should be abandoned or scaled back, but that its implementation must be accompanied by sustained investment in the three structural conditions that its effectiveness presupposes: adequate technical capacity, informed community engagement, and robust institutional accountability none of which can be taken for granted in the context of Eastern Indonesia's land administration landscape.[43]

4. The Impact of Digital Certificate Mapping (Plotting) on the Acceleration of Agrarian Reform at the Kolaka Regency Land Office

The question of *impact* in the context of digital *plotting* and agrarian reform is, at its core, a question of whether a technological intervention in land administration produces the structural legal and social transformation that the agrarian reform programme demands. Presidential Regulation Number 86 of 2018 concerning Agrarian Reform subsequently revised by Presidential Regulation Number 62 of 2023 defines agrarian reform as the restructuring of the pattern of control, ownership, use, and utilization of agrarian resources, with social justice as its animating purpose. The reform programme operates on two interconnected tracks: asset legalization, which encompasses the systematic registration and certification of land rights, and access reform, which addresses the structural conditions credit, technology, markets, and community organization through which cer-

[42] Imam Sukadi et al., "Legal Politics Electronic Land Certificate in Indonesia," *Jurnal USM Law Review* 7, no. 3 (2024): 1323–1338, https://doi.org/10.26623/julr.v7i3.9625

[43] Farah Ananda Resti and Harvini Wulansari, "The Role of the Agrarian Reform Task Force in Creating an Agrarian Reform Village," *Tunas Agraria* 5, no. 2 (2022): 94–110, https://doi.org/10.31292/jta.v5i2.178.

tified land rights can be translated into actual improvements in welfare.[44] Digital *plotting* occupies a specific and critical position in the first of these tracks: it is the mechanism through which the spatial identity of agrarian reform objects redistributed parcels, communal land, PTSL-certified land is established, validated, and inscribed in the national digital cadastre. If *plotting* functions well, it performs a foundational service for the entire reform programme; if it functions poorly, or if its outputs are corrupted by data error or institutional abuse, it undermines the legal foundation upon which the entire edifice of agrarian reform is built.[45]

The primary and most structurally significant impact of digital *plotting* at the Kolaka Regency Land Office is its effect on legal certainty specifically, on the capacity of the *plotting* system to produce, for each registered parcel, a verifiable and spatially accurate digital identity that corresponds to the physical reality of the land and that is immune from competing claims grounded in prior ambiguity. The theory of legal certainty that underlies the entire architecture of Indonesia's land registration system demands, as a minimum, three conditions: certainty about the rights holder (juridical certainty), certainty about the physical extent and boundaries of the land (spatial certainty), and certainty about the legal nature and encumbrances of the right (normative certainty). The contribution of *plotting* to legal certainty is concentrated in the second of these dimensions: by requiring that every certificate undergo GPS-based spatial validation against the digital registration base map before any land service transaction is processed, *plotting* imposes a systematic audit of the spatial content of existing certificates, identifying and correcting errors, overlaps, and mismatches that were invisible in the analogue registration system.[46] This constitutes, in normative terms, a retroactive quality control of the registration system's historical outputs a systematic correction of the spatial legacy of decades of manual cadastral practice.

The evidence from the Kolaka Regency Land Office confirms that *plotting*, where correctly implemented, has produced concrete and documentable improvements in spatial legal certainty. Field research data indicate that the *plotting* process has detected and flagged a significant number of certificates whose recorded spatial dimensions or locations did not correspond to field conditions including cases of cadastral overlap, positional displacement, and boundary discrepancy which would, if undetected and uncorrected, have remained latent sources of conflict capable of erupting into costly and protracted land disputes. The prevention of *sertipikat ganda* (double certificates) through the spatial overlap detection capability of the KKP digital map system represents one of the most direct and measurable legal impacts of *plotting*: a parcel that has been accurately plotted and whose digital footprint is established in the KKP base map cannot, in principle, be legitimately re-registered or over-registered without triggering a conflict flag in the system.[47] This preventive mechanism does not merely reduce the volume of disputes; it changes the structural conditions under which land rights are held, transforming the certificate from a document of con-

[44] Dwi Oktavia Lestari et al., "Handling Access to Agrarian Reform After Legalization of Assets in Cilacap Regency," *Jurnal Marcapada* 3, no. 2 (2024): 1–14, https://doi.org/10.56860/jm.v3i2.53.

[45] Ahmad Nashih Luthfi et al., "The Antinomy of Agrarian Reform Regulations After the Establishment of the Land Bank Authority," *Jurnal Ilmu Komputer dan Hukum* 5, no. 1 (2024): 15–28, https://doi.org/10.19184/jik.v5i1.46593.

[46] Rezeki Aldila Rajab, Bambang Eko Turisno, and Anggita Doramia Lumbanraja, "Certificate of Land Rights in the Legal Certainty of Land Registration," *Masalah-Masalah Hukum* 13, no. 2 (2020): 642–654, https://doi.org/10.14710/nts.v13i2.31085.

[47] Baiq Rika Septiana Wardani, "Legal Consequences of the Issuance of Overlapping Certificates in the Complete Systematic Land Registration Program," *Journal of Notarial Minutes* 4, no. 1 (2023): 97–115, https://doi.org/10.29303/risalahkenotariatan.v4i1.90.

tested nominal value into an instrument of substantive legal security whose spatial content can be publicly verified.

This improvement in spatial legal certainty has downstream effects on the acceleration of agrarian reform that extend beyond the immediate protection of individual rights holders. Agrarian reform, in its distributional logic, requires that the redistribution of land from those who control it unlawfully or in excess of legal limits to those who need it for their welfare be conducted on the basis of accurate, undisputed, and legally settled parcel data. A land redistribution programme that distributes land whose spatial identity is uncertain or contested does not create secure beneficiaries; it creates new claimants in a pre-existing dispute, with no net improvement in agrarian justice.[48] The *plotting* system's capacity to establish the spatial integrity of agrarian reform objects to produce, for each redistributed parcel, a digitally verified certificate whose spatial content corresponds to the physical reality of the land is therefore a precondition for the effective delivery of agrarian reform's distributional promise. The Kolaka Regency Land Office's implementation of *plotting* as a prerequisite for PTSL certification and agrarian reform object processing reflects a correct normative understanding of this relationship, even if the structural constraints documented in this research constrain the system's ability to fulfil its function comprehensively.

A second dimension of *plotting*'s impact on agrarian reform acceleration lies in its contribution to administrative efficiency. The analogue land registration process involving physical measurement by government surveyors, manual cartographic work, paper-based bookkeeping, and sequential administrative processing was characterized by high transaction costs, extended processing times, and a bottleneck structure in which the scarcity of government surveyor capacity was the binding constraint on the pace of land registration. The *plotting* system, by incorporating licensed cadastral surveyors as privatized measurement agents operating under professional licences and accountability standards, and by integrating their outputs directly into the SIPETIK digital platform, introduces a structural decomposition of the registration process that allows measurement and data entry to proceed in parallel with administrative processing, rather than sequentially.[49] The digital integration of SIPETIK with the KKP system, and its real-time accessibility to authorized officials across the BPN network, further reduces the information transmission delays that in the analogue system required physical transfer of documents between offices and sub-offices. These efficiency gains are real and substantial, and they contribute directly to the pace of certification and therefore to the tempo of agrarian reform delivery. Field research at the Kolaka Regency Land Office confirms that the digitalization of the registration process has accelerated the per-parcel processing time for PTSL applications compared to the pre-digital baseline, even accounting for the *plotting* requirement as an additional step in the process.

A third and critically underexamined dimension of *plotting*'s impact on agrarian reform is its potential to enhance the transparency and accountability of the land administration system itself, and thereby to reduce the conditions that have historically made agrarian administration in Indonesia a site of institutional rent-seeking and corruption. The digitalization of cadastral data,

---

[48] Budianto Eldist Noor et al., "Bridging the Gap by Exploring Inequalities in Access to Land and Disparities in Agrarian Law in Indonesia," *Jurnal Ilmu Komputer dan Hukum* 5, no. 1 (2024): 1–14, https://doi.org/10.19184/jik.v5i1.47416.

[49] Ratrianto, Fauzan Murdapa, and Ratna Widyawati, "The Role of Licensed Surveyors in Accelerating Land Registration in Indonesia," *Jurnal Rekayasa Lampung* 1, no. 1 (2022): 45–58.

by making spatial records accessible, cross-referenceable, and auditable in ways that paper-based systems never permitted, creates structural conditions for greater administrative accountability. When a certificate's spatial record exists in a digital system that can be queried, cross-checked against adjacent parcels, and verified by the rights holder through the *Touch My Land* application, the space for undetected manipulation of spatial records is, in principle, narrowed.[50] The case of Okoko Village, examined in the first section of this discussion, demonstrates both the reality of this potential and the extent to which it remains unrealized in the current state of implementation. The institutional fraud documented in Okoko Village was made possible precisely because the *plotting* system's transparency and accountability mechanisms notification requirements, community verification rights, internal audit functions were not operational in the manner the system's normative design intended. That the fraud could, in principle, be detected through the digital record is evidence of the system's transformative potential; that it occurred nonetheless is evidence of the accountability deficit that persists within current implementation practices.

The impact of digital *plotting* on the agrarian reform programme's anti-corruption dimension must therefore be understood in conditional rather than absolute terms. *Plotting* creates the structural preconditions for transparency a digital record that is queryable, cross-verifiable, and publicly accessible but it does not automatically produce transparency where the institutional conditions for transparency are absent. In regions where community digital literacy is low, where the *Touch My Land* application penetration is limited, where the internal oversight functions of the Land Office are under-resourced, and where professional accountability mechanisms for SKB are weakly enforced, the transparency potential of the *plotting* system remains latent and unrealized.[51] The critical implication is not that *plotting* fails to contribute to agrarian reform's anti-corruption objectives, but that this contribution is contingent on institutional investments in community capacity, internal oversight, and professional accountability that must accompany the technical implementation of the digital system if its anti-corruption potential is to be actualized.

A fourth dimension of *plotting*'s impact deserves critical scrutiny that the existing literature has largely failed to provide: the question of whether the acceleration of agrarian reform through *plotting* is, under current implementation conditions in Kolaka Regency, substantively equitable in its distribution of benefits. Agrarian reform, as understood in the framework of progressive agrarian law, is not value-neutral in its distributive logic: it is specifically oriented toward the redemption of historical injustice in land access, and its beneficiaries are defined by their structural marginality small farmers, rural communities, indigenous people, and the landless poor.[52] If the *plotting* system's implementation in practice preferentially benefits those who are already formally registered, digitally literate, and administratively connected while leaving the most marginalized rights holders outside the scope of effective *plotting* coverage then it accelerates a form of agrarian reform that reproduces, rather than corrects, the structural inequality that the reform programme was designed to address. The antinomy embedded in this dynamic is sharp and uncomfortable: the digital *plotting* system, designed as an instrument of agrarian justice, may in practice function as an

[50] Irwan Santosa and Endang Purwaningsih, "Analysis of the Implementation of Digital Transformation of Land Certificates in Era 4.0," *Surya Kencana Dua* 9, no. 1 (2022): 16–24, https://doi.org/10.32493/skd.v9i1.y2022.22496.

[51] Imam Sukadi et al., "Legal Politics Electronic Land Certificate in Indonesia," *Jurnal USM Law Review* 7, no. 3 (2024): 1323–1338, https://doi.org/10.26623/julr.v7i3.9625.

[52] Siti Malikhatun Badriyah et al., "Progressive Agrarian Law as a Concept to Attain Social Justice," *Pandecta Research Law Journal* 17, no. 1 (2022): 95–108, https://doi.org/10.15294/pandecta.v17i1.34022.

instrument of agrarian exclusion for those whose land has not been registered, whose location is geographically remote, and whose claims to land are grounded in customary and informal tenure rather than in the formal documentation that the *plotting* process requires.[53]

The handling of access reform in the post-legalization phase the dimension of agrarian reform that connects certified land rights to productive use through credit access, technical assistance, and market linkages is also relevant to an assessment of *plotting*'s impact. Field evidence from other Indonesian jurisdictions suggests that land certification through PTSL and related programmes increases community motivation to utilize certified land productively, and that certificate holders who understand the legal and economic significance of their title are more likely to engage with access reform opportunities than those who received their certificate without adequate accompanying explanation.[54] In Kolaka Regency, where socialization of the *plotting* process and the legal significance of digital certification has been inadequate, this motivational link between certification and access reform is weakened. Certificate holders who do not understand what it means for their land to be *plotted* are poorly positioned to leverage their certified title as the legal and financial asset that access reform requires them to use. The asymmetry between the state's emphasis on the *pace* of certification (measured in certificates issued per year) and its investment in the *depth* of understanding among certificate recipients is a structural weakness in the current implementation model that constrains the downstream impact of *plotting* on agrarian reform's social justice objectives.

The relationship between digital *plotting* and environmental sustainability in the context of Kolaka Regency's agrarian landscape also warrants analysis. Kolaka Regency contains areas of ecological significance forest zones, watershed areas, and coastal lands whose legal status intersects with the land rights of rural communities in complex ways that manual cadastral systems were structurally incapable of resolving. The digital base map produced by systematic *plotting* creates, for the first time, a spatially explicit record of the entire pattern of land registration in the regency, enabling the Land Office and regional spatial planning authorities to identify areas where registered land rights overlap with forest boundaries, protected zones, or environmental conservation areas.[55] This spatial intelligence, which is a by-product of the *plotting* system's cadastral function, has significant potential for supporting environmentally responsible agrarian governance ensuring that land redistribution is directed toward legally available land, and that the certification process does not inadvertently legitimize encroachments on ecologically critical areas. However, realizing this potential requires institutional coordination between the Land Office, the Forestry Service, and the Regional Spatial Planning Office that, field research suggests, is not yet systematically operationalized in Kolaka Regency.

The aggregated assessment of digital *plotting*'s impact on agrarian reform acceleration in Kolaka Regency yields a finding that is simultaneously affirming of the policy's direction and critical of the adequacy of its current implementation. *Plotting* has produced genuine and documentable impacts on spatial legal certainty, administrative efficiency, and the structural prevention of dou-

---

[53] Indro Budiono et al., "Internalization Free, Prior, and Informed Consent as Indigenous Alienation Resistance in Structural Agrarian Conflict," *Jurnal Cakrawala Hukum* 14, no. 3 (2023): 220–231, https://doi.org/10.26905/idjch.v14i3.11486.

[54] Farah Ananda Resti and Harvini Wulansari, "The Role of the Agrarian Reform Task Force in Creating an Agrarian Reform Village," *Tunas Agraria* 5, no. 2 (2022): 94–110, https://doi.org/10.31292/jta.v5i2.178.

[55] M. Japar et al., "Analysis of Community Readiness in Implementing the Electronic Land Certification Program: A Review of Legal Sociology," *Jurnal Ilmu Hukum* 7, no. 1 (2024): 81–90, https://doi.org/10.32493/rjih.v7i1.43502.

ble certificates. These are real contributions to the normative goals of Indonesia's agrarian reform programme, and they demonstrate that the policy choice to mandate *plotting* as a prerequisite for all land service transactions was a legally sound and practically important decision. At the same time, the evidence from Kolaka Regency reveals that the transformative potential of the *plotting* system its capacity to produce equitable legal certainty, systemic transparency, and genuine agrarian justice is constrained by structural deficits in implementation capacity, institutional accountability, and community engagement that are not inherent to the technology but are products of the conditions under which it has been deployed. The *plotting* system is a necessary but not sufficient condition for the realization of agrarian reform's constitutional mandate; its sufficiency depends on the quality of the institutional ecosystem that surrounds and supports it.[56]

5. Conclusion

Digital certificate mapping (*plotting*) at the Kolaka Regency Land Office constitutes a structurally significant instrument for advancing two interrelated legal objectives: the establishment of spatial legal certainty over registered land rights, and the acceleration of agrarian reform through the digitalization of cadastral administration. The normative foundation of *plotting* grounded in Article 19 of the UUPA, Government Regulation Number 24 of 1997, and Ministry of ATR/BPN Circular Number 13/SE/XII/2017 is legally sound and the policy direction it embodies is correct. When implemented with professional integrity, adequate technical capacity, and rigorous quality control, *plotting* fulfils the state's constitutional obligation to provide legal certainty over land rights by making the spatial identity of registered parcels accurate, verifiable, and protected against competing claims.

However, the empirical evidence from Kolaka Regency reveals a persistent and consequential gap between the normative promise of *plotting* and the operational reality of its implementation. Data errors inscribed in the SIPETIK system, as demonstrated by the Ny. Harmiani case, and institutional abuse of the *plotting* mechanism, as documented in Okoko Village, expose structural deficits in technical capacity, institutional accountability, and community engagement that undermine the system's legal effectiveness precisely for the most vulnerable rights holders it is designed to protect.

The transformative potential of digital *plotting* for agrarian reform cannot be realized through technological deployment alone. It requires sustained, coordinated investment in three structural conditions: the expansion of licensed cadastral surveyor capacity across underserved regions of Eastern Indonesia; the strengthening of institutional accountability and community-facing transparency mechanisms within the Land Office; and systematic socialization that equips rural communities to understand, verify, and defend the legal value of their digitally registered rights. Only when these three conditions are present can digital *plotting* become the genuine instrument of agrarian justice that its constitutional mandate demands.

[56] Erick Ricardo and Achmad Faishal, "Government Policy in Overcoming Land Problems in the Era of Digitalization and Its Implementation of the Duties and Functions of Notaries," *Das Sollen Law Journal* 10, no. 1 (2024): 1–17, https://doi.org/10.32520/das-sollen.v10i1.3409.

References

Badriyah, Siti Malikhatun, et al. "Progressive Agrarian Law as a Concept to Attain Social Justice." *Pandecta Research Law Journal* 17, no. 1 (2022): 95–108. https://doi.org/10.15294/pandecta.v17i1.34022.

Budiono, Indro, et al. "Internalization Free, Prior, and Informed Consent as Indigenous Alienation Resistance in Structural Agrarian Conflict." *Jurnal Cakrawala Hukum* 14, no. 3 (2023): 220–231. https://doi.org/10.26905/idjch.v14i3.11486.

Erfa, Riswan. "Digitalization of Land Administration to Realize Accelerated National Development from a Legal Policy Perspective." *Jurnal Pertanahan* 10, no. 1 (2020): 1–15. https://doi.org/10.53686/jp.v10i1.31.

Japar, M., et al. "Analysis of Community Readiness in Implementing the Electronic Land Certification Program: A Review of Legal Sociology." *Jurnal Ilmu Hukum* 7, no. 1 (2024): 81–90. https://doi.org/10.32493/rjih.v7i1.43502.

Kurniati, Nanik, and Efa L. Fakhriah. "Strengthening Land Registration System through Implementation of Domain Approach in Manifesting Legal Certainty and Community Justice." *Sosiohumaniora* 23, no. 3 (2021): 261–270. https://doi.org/10.24198/sosiohumaniora.v23i3.32579.

Lestari, Dwi Oktavia, et al. "Handling Access to Agrarian Reform After Legalization of Assets in Cilacap Regency." *Jurnal Marcapada* 3, no. 2 (2024): 1–14. https://doi.org/10.56860/jm.v3i2.53.

Lestario, Arie, and Erlina Erlina. "Land Registration System that Provides Legal Protection for Land Rights Certificate Holders in Indonesia." *Notary Law Journal* 1, no. 1 (2022): 1–30. https://doi.org/10.32801/nolaj.v1i1.1.

Luthfi, Ahmad Nashih, et al. "The Antinomy of Agrarian Reform Regulations After the Establishment of the Land Bank Authority." *Jurnal Ilmu Komputer dan Hukum* 5, no. 1 (2024): 15–28. https://doi.org/10.19184/jik.v5i1.46593.

Maulana, Hashfi, et al. "The Urgency of Electronic Certificates with AI-Based Monitoring for Land Registration Efficiency and Land Mafia Mitigation in Indonesia." *Journal of Customary Law* 2, no. 1 (2024): 1–15. https://doi.org/10.47134/jcl.v2i1.3304.

Mukhlis, Erwan, et al. "Implementation of the Complete Systematic Land Registration Program in Aceh, Indonesia." *Otoritas: Jurnal Ilmu Pemerintahan* 11, no. 2 (2021): 143–159. https://doi.org/10.26618/ojip.v11i2.4156.

Noor, Budianto Eldist, et al. "Bridging the Gap by Exploring Inequalities in Access to Land and Disparities in Agrarian Law in Indonesia." *Jurnal Ilmu Komputer dan Hukum* 5, no. 1 (2024): 1–14. https://doi.org/10.19184/jik.v5i1.47416.

Rachmawati, Sisca Anindiya. "Land Registration System Revolution Through Complete Systematic Land Registration Program (PTSL) Field Study in Bantul Village." *Legal Institutions* 3, no. 1 (2021): 105–106. https://doi.org/10.37631/widyapranata.v3i1.273.

Rajab, Rezeki Aldila, Bambang Eko Turisno, and Anggita Doramia Lumbanraja. "Certificate of Land Rights in the Legal Certainty of Land Registration." *Masalah-Masalah Hukum* 13, no. 2 (2020): 642–654. https://doi.org/10.14710/nts.v13i2.31085.

Ratrianto, Fauzan Murdapa, and Ratna Widyawati. "The Role of Licensed Surveyors in Accelerating Land Registration in Indonesia." *Jurnal Rekayasa Lampung* 1, no. 1 (2022): 45–58.

Razak, Mashita Amalia, Farida Patittingi, and Maskun Maskun. "Digital Certificate Mapping (Plotting) in Providing Legal Certainty for Land Rights." *Petisi* 8, no. 2 (2020): 143–156. https://doi.org/10.36090/jh.v8i2.818.

Resti, Farah Ananda, and Harvini Wulansari. "The Role of the Agrarian Reform Task Force in Creating an Agrarian Reform Village." *Tunas Agraria* 5, no. 2 (2022): 94–110. https://doi.org/10.31292/jta.v5i2.178.

Ricardo, Erick, and Achmad Faishal. "Government Policy in Overcoming Land Problems in the Era of Digitalization and Its Implementation of the Duties and Functions of Notaries." *Das Sollen Law Journal* 10, no. 1 (2024): 1–17. https://doi.org/10.32520/das-sollen.v10i1.3409.

Santosa, Irwan, and Endang Purwaningsih. "Analysis of the Implementation of Digital Transformation of Land Certificates in Era 4.0." *Surya Kencana Dua: Jurnal Dinamika Masalah Hukum dan Keadilan* 9, no. 1 (2022): 16–24. https://doi.org/10.32493/skd.v9i1.y2022.22496.

Sitompul, Dayan Hakim, et al. "Empirical Legal Investigation of Land Disputes: The Case of Rantau Pandan, Bungo Regency." *Al-Manhaj: Jurnal Hukum dan Pranata Sosial Islam* 6, no. 1 (2024): 65–74. https://doi.org/10.37680/almanhaj.v6i1.4484.

Sukadi, Imam, et al. "Legal Politics Electronic Land Certificate in Indonesia." *Jurnal USM Law Review* 7, no. 3 (2024): 1323–1338. https://doi.org/10.26623/julr.v7i3.9625.

Wahyono, Eko Budi. "Implementation of Regulations on Licensed Cadastral Surveyors to Accelerate Land Registration at the Regional Office of the North Sumatra Provincial Land Agency." *BHUMI: Agrarian and Land Journal* 3, no. 2 (2017): 217–231. https://doi.org/10.31292/JB.V3I2.125.

Wardani, Baiq Rika Septiana. "Legal Consequences of the Issuance of Overlapping Certificates in the Complete Systematic Land Registration Program." *Journal of Notarial Minutes* 4, no. 1 (2023): 97–115. https://doi.org/10.29303/risalahkenotariatan.v4i1.90.