



Digital Measurement Model as a Support Tool for the Validity of Village Land Administration Data

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Article Process

Submitted:
17-11-2024

Reviewed:
27-12-2024

Accepted:
27-01-2025

Published:
31-01-2025

Abstract

This research aims to recommend the implementation of the digital measurement model on Village Devices and Land Data Collectors (PULDATAN) so that the collection of land data, both physical and juridical, serves as a means to support the validity of village land data. This aims to support the National Program for Complete Systematic Land Registration as mandated by Article 19 of Law Number 5 of 1960 on the Basic Agrarian Law. The location of this research is conducted in Panembangan Village, Cilongok District, Banyumas Regency. The research on the model of implementing digital measurement in village administration was conducted through the following stages: *First*, Updating the Juridical Data of Village Land; *Second*, Updating the Physical Data of Village Land; *Third*, Computerization and Digitalization of Village Land Administration. The method used in this research is the empirical juridical method. This research aims to review the application of digital measurement as a form of implementing land administration law in villages to support the validity of land data in the villages. This research produces a digital measurement model in villages to prevent agrarian disputes/conflicts. The validity of village land data is the initial gateway to land administration order.

Keywords: Model Digital Measurement, Land Data Validity, Village Land Administration, Land Law

I. Introduction

The availability of accurate land ownership in this case is an aspect that cannot be ruled out in order to ensure legal certainty of land ownership in Indonesia. The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) has set a target to register 120 million land parcels by 2024 with a realization rate of 80%.¹ This figure proves that there are still

¹ Hilda B Alexander Suhaiela Bahfein, Kementerian ATR/BPN Targetkan Sertifikat Tanah Mencapai 120 Juta Bidang Pada 2024, dikutip dari laman: <https://nasional.kontan.co.id/news/kementerian-atrbpn-targetkan-sertifikat-tanah-mencapai-120-juta-bidang-pada-2024>; diakses pada ...

25.1 million people's land that has not been registered. Article 28 H paragraph (4) of the 1945 Constitution further explains the community's right to legal certainty regarding land registration and certification in order to prevent arbitrary land expropriation.²

Law No. 5/1960 on Basic Agrarian Principles through Article 19 has mandated the importance of registering and inventorying land ownership³. Land ownership in this case must be recorded and there continues to be clarity regarding the specifications of land ownership in order to avoid problems and conflicts in the future. Land registration can provide legal certainty of land rights, so the processing of physical data and juridical data in land registration must be comprehensive, transparent, accountable and professional as the spirit in land processing.⁴ Physical Data and Juridical Land Data are important documents as proof of land ownership as well as a guarantee of legal certainty.⁵ Various problems of physical and juridical data discrepancies were encountered. Problems that arise include inaccuracies in land measurement, disagreements over land boundaries and others.⁶ The problem of village physical and juridical data is a complex issue involving various aspects and factors. Difficulties in the data collection process, loss of land parcel data, geographical land contours that make it difficult to calculate land, and institutional problems in recording land data are the main causes that have consequences for the uncertainty and decline in the quality of village land data⁷ as the main data in land registration. If the data is not valid, the guarantee of legal certainty in land registration is questionable, whereas the purpose of land registration is in accordance with Gustav Radbruch's theory of legal philosophical goals in his book "legal philosophy" which must accommodate public benefit, justice, and legal certainty.⁸

The condition becomes the urgency of this research, which is motivated by the existence of a conventional village land data inventory by village officials and land data collectors, which often leads to various land disputes. Village officials still rely on Letter C Books, which are no longer up to date both in terms of physical condition and substance. The community also does not immediately update their land data, especially in the case of inheritance and land sale and purchase, by notifying the village government.

This research is different from previous research that discusses village land data, namely research from Andi Muhammad Al Ilham Akbar Johamran P which discusses the Effectiveness of Physical Data Management and Juridical Data according to Government Regulation Number 24 of 1997 concerning Land Registration.⁹ In addition, there is research from Johamran Pransisto which discusses the Juridical Analysis of Physical and Juridical Data Processing in Land Registration according to PP Number 24 of 1997 at the Maros Regency Land Office.¹⁰ The difference with this study is that it discusses and recommends the Digital Measurement Implementation Model as a means of supporting the validity of village land data administration that can prepare for Complete Systematic Land Registration as a National Government Program.

² Lia Liliawati and Sunarti Dwi Resky Fani, "Analisis Prosedur Pembuatan Sertipikat Hak Milik (Individual) Melalui Program Pendaftaran Tanah", *Program Studi Administrasi Bisnis Politeknik Sukabumi 1*, No. 1 (2018): 1.

³ Muh Arif Suhattanto, Sarjita, and Dian Aries Mujiburohman, "Jurnal Widya Bhumi Kualitas Data Pertanahan Menuju Pelayanan Sertifikat Tanah Elektronik", *Widya Bhumi 1*, No. 2 (2021): 87-100.

⁴ Andi Muhammad Al Ilham Akbar Johamran, "Efektivitas Pengelolaan Data Fisik dan Data Yuridis Menurut Peraturan Pemerintah Nomor 24 Tahun 1997 tentang Pendaftaran Tanah", *Journal of Philosophy 3*, No. 2 (2022): 240.

⁵ Christiana Sri Murni and Sumirahayu Sulaiman, "Sertifikat Hak Milik Atas Tanah Merupakan Tanda Bukti Hak Kepemilikan Tanah," *Lex Librum : Jurnal Ilmu Hukum 8*, No. 2 (2022): 183-98.

⁶ Amel Kurniawan, *Penyelesaian Sengketa Data Fisik Sertifikat Tanah di Kantor Pertanahan (Studi Kasus di BPN Karanganyar)*, (Skripsi: Universitas Muhammadiyah Surakarta, 2019), 3.

⁷ Reza Nur Amrin and Amalia Arofah Puji Sopyan, "Pemanfaatan Data Spasial Aplikasi Komputerisasi Kantor Pertanahan Dalam Peningkatan Informasi Geospasial Pada Aplikasi Petakita", *Kadaster: Journal of Land Information Technology 1*, No. 1 (2023): 18-32.

⁸ E. Fernando M. Manullang, "Misinterpretasi Ide Gustav Radbruch Mengenai Doktrin Filosofis Tentang Validitas Dalam Pembentukan Undang-Undang", *Undang: Jurnal Hukum 5*, No. 2 (2022): 453-80.

⁹ Andi Muhammad Al Ilham Akbar Johamran, "Efektivitas Pengelolaan Data Fisik dan Data Yuridis Menurut Peraturan Pemerintah Nomor 24 Tahun 1997 tentang Pendaftaran Tanah", *Journal of Philosophy 3*, No. 2 (2022): 239-258.

¹⁰ Johamran Pransisto, "Analisis Yuridis Pengolahan Data Fisik dan Yuridis dalam Pendaftaran Tanah menurut PP Nomor 24 Tahun 1997 di Kantor Pertanahan Kabupaten Maros", *Jurnal Litigasi Amsir, Special Issues (2023)*: 219-238.

This study begins by explaining the idea of the Digital Measurement Implementation Model during the collection and maintenance of land data in the village so that land data becomes a means of validity of land data and administrative order can be realized Followed by identifying factors that affect the effectiveness of digital measurement implementation based on empirical research in Panembangan Village, CIlongok District, Banyumas Regency.

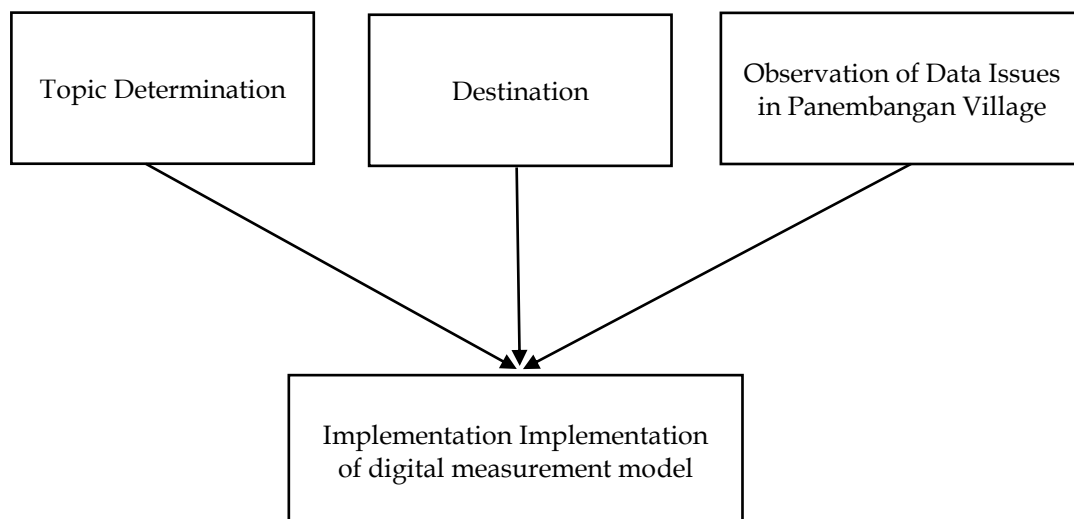
II. Research Problems

How can the digital measurement model be applied in village administration to improve the validity of land data?

III. Research Methods

The research framework used in this research is a type of qualitative research using literature studies from various literatures with similar research mechanisms regarding the settlement of land juridical data. Furthermore, the author also uses a direct observation method to the field to conduct a survey and inventory of land juridical data problems in Panembangan Village.

Figure 1. Research flow



Source: Author's Analysis

The approach method in this research uses a combined qualitative method between literature study and direct field study;

1. Literature Study. Conceptual framework by collecting supporting data, previous research, theories, and conceptions of comparison that can support comprehensive juridical data research¹¹. Reviewing through this concept helps the author in mapping out problems and previous ideas so that research can be carried out more fully and on target.
2. Field Study. This method is carried out by observing supporting data that directly targets Panembangan Village so that case study data can be more accurate and implementable.

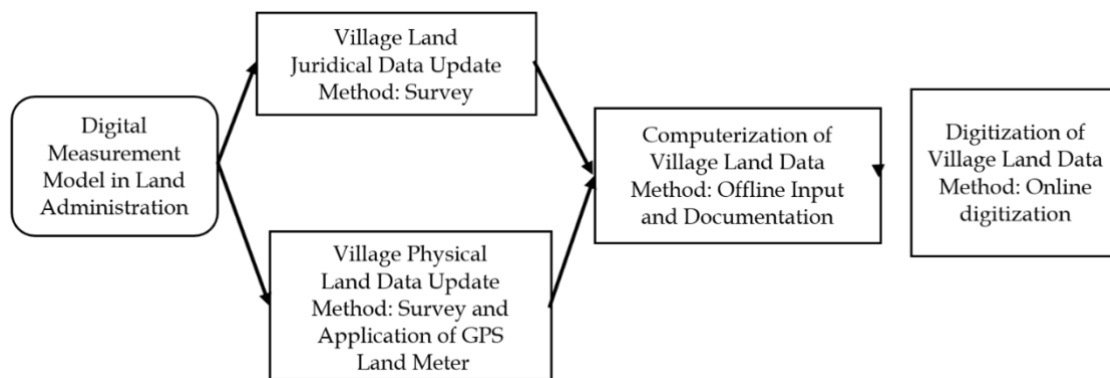
¹¹ Miza Nina Adlini et al., "Metode Penelitian Kualitatif Studi Pustaka," *Edumaspul: Jurnal Pendidikan* 6, No. 1 (2022): 974-80.

IV. Result And Discussion

The administration of village land is mandated by Regulation of the Minister of Home Affairs No. 47 of 2016 on Village Government Administration, which emphasizes systematic data recording. However, research findings indicate that many villages continue to rely on outdated Letter C Books, leading to inaccuracies and inefficiencies in land administration. This issue is evident in Panembangan Village, where manual record-keeping practices result in unreliable land data.¹² However, based on existing research, the village has not implemented these provisions and still relies on Letter C Books that are outdated both physically and in terms of substance. Old Letter C books with worn paper conditions are certainly prone to damage.¹³ The Letter C Book is a guideline for the village head to issue a Village Land Certificate. This Letter C book contains physical data information in the form of location and area of land parcels, as well as juridical data information regarding the history of land tenure. This Letter C book is still written manually and the data has not been updated, which has an impact on the invalidity of village land data. This also happened in Panembangan Village, Cilongok District, Banyumas Regency.

A breakthrough in digital technology is needed to support the validity of village land administration by updating physical data and juridical data effectively and efficiently. This research recommends a Digital Measurement Model in Village Land Administration as a supporter of the validity of village land data that has received less attention in maintaining its data which can have legal implications. This model has been implemented in Panembangan Village. The Digital Measurement Model in Village Land Administration is a model for updating both physical and juridical data so that it can support the validity of village land data. This model is generated from multi-disciplines between land law science and is supported by land mapping science and informatics engineering. The following will explain the Digital Measurement Model in Village Land Administration which includes 2 (two) main focuses, namely: Village Land Juridical Data Update and Village Land Physical Data Update.

Figure 2. Digital Measurement Model in Village Land Administration



Source: Author's Analysis

1. Village Land Juridical Data Update

Juridical land data is information regarding the legal status of land parcels and apartment units that are registered, their right holders and the rights of other parties as well as other burdens

¹² Sri Wahyu Handayani, "Village Land Administration as an Effort to Prevent Agrarian Disputes/Conflicts" *Kosmik Hukum* 23, No. 1 (2023): 2.

¹³ Eri Setyawan, "Sistem Pengelolaan Dan Pengamanan Arsip Data Letter C Desa (Studi Kasus : Kantor Desa Gondang)", *Jurnal Mahasiswa Teknik Informatika*, No. 2 (2022): 655.

that burden them.¹⁴ Juridical data shows the legal subject who legally controls an object of land. In the complete systematic land registration, juridical data can be sourced from the Letter C Book that is stored and managed in the village. However, it was found that the substance of the Letter C Book in the village was no longer valid. An innovation is needed in updating juridical data that is effective and efficient. The collection and updating of juridical data in the Digital Measurement Model in Village Land Administration is carried out using a survey method with several questions that show the history of land tenure. The survey data includes: the identity of the landowner, land ownership history, proof of land ownership, land location, land area, surrounding land boundaries, and information on current land disputes if any. Problems experienced in the collection of juridical data usually involve the absence of customary land ownership documents such as girik/pethuk.¹⁵ To complement this, a Tax Notice for Land and Building Taxes that shows the goodwill of the landowner can also be included. In Complete Systematic Land Registration, if it is found that the landowner's land ownership history is incomplete, it can be completed and proven by a written statement with sufficient stamp duty regarding the ownership and/or physical control of the land parcel in good faith from the party concerned. Indicators of good faith are that there are no parties objecting to the land owned or not in a state of dispute, not including government assets, and not a forest area.

Legal awareness is an abstract conception that influences the awareness of acting in accordance with the provisions of the applicable laws. This means that legal awareness is a basic prerequisite that connects legal construction with the level of policy implementation¹⁶. In this case, the Panembangan Village community's legal awareness of the importance of land registration has not been maximized. The community still has a tendency to be uncooperative and difficult to carry out registration activities, transfers, or all matters relating to land administration. This is a result of the community's incomplete understanding of land registration and often considers land registration to be costly.¹⁷ This situation has led to further problems in the form of disputes/conflicts such as multiple certificates, land boundary disputes, and land grabbing conflicts. Observations in Panembangan Village have even found land conflicts where there is a transfer of land owners who are outside the village without the knowledge of the Village Government. Problems then arise regarding the urgency of updating Panembangan Village's land juridical data through the PTSL program and accelerating public awareness of the importance of land registration through education and socialization processes.

2. Village Physical Land Data Update

A. Geographical Condition of Panembangan Village

Panembangan Village is located in Banyumas Regency and has been classified as a developed village based on the Village Development Index (IDM) with a value of 0.8102¹⁸. Based on observation, Panembangan Village has an area of up to 257,945 hectares with land use of roads covering 13,758 hectares, rice fields 137 hectares, fields/plantations covering 46,154 hectares, fish ponds/empangs 0.95 hectares, settlements/residential areas covering 52,317 hectares, public buildings covering 3,176 hectares, cemeteries 4.59, and others covering 19,027 hectares.

¹⁴ Pasal 1 Angka 7 Peraturan Pemerintah Nomor 24 Tahun 1997 tentang Pendaftaran Tanah. Lembaran Negara Republik Indonesia Nomor 59 Tahun 1997.

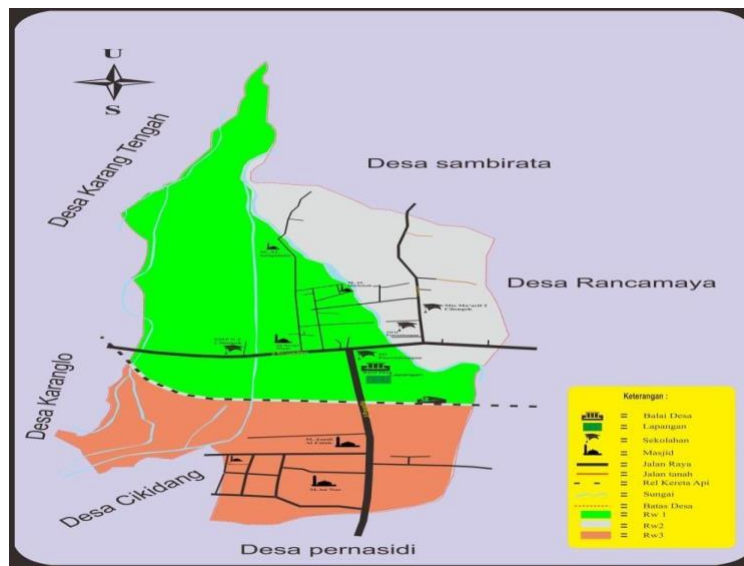
¹⁵ I Gusti Ngurah Anom, "Kekuatan Pembuktian Data Fisik dan Data Yuridis dalam Pendaftaran Tanah Sistematis Lengkap di Kabupaten Bangli, Provinsi Bali," *Journal of Economic and Business Law Review* 1, No. 1 (2021): 42.

¹⁶ Ana Silviana, "Kajian Tentang Kesadaran Hukum Masyarakat Dalam Melaksanakan Pendaftaran Tanah," *Jurnal Pandecta* 7, No. 1 (2012): 113–22.

¹⁷ Isdiana Ayu Kusuma, "Problematika Pelaksanaan Pendaftaran Tanah Melalui Tanah Sistematis Lengkap Di Kota Batu," *Legality: Jurnal Ilmiah Hukum* 27, No. 1 (2019): 27.

¹⁸ Direktorat Jenderal Pembangunan Desa dan Perdesaan, (2002).

Figure 3. Geospatial Map of Panembangan Village



Source: Panembangan Village Government

Furthermore, the entire land area in Panembangan Village already has a Tax Notification Letter (SPPT) up to 100%, reaching 1442 SPPT, only not all of them have land rights certificates and property rights. This is partly due to the fact that Panembangan Village has not yet participated in the National Program for Complete Systematic Registration (PTSL), so further socialization efforts are needed to encourage residents to certify land in order to prevent land conflicts/disputes and ensure legal certainty for the community¹⁹. These conditions put Panembangan Village's land registration achievement rate at a low 50%. The PTSL registration process in this context is a method that can improve land registration and is effective as an effort to build a systematic land administration system²⁰. Both problems lead to potential conflicts and land data confusion that must be resolved.

Physical data of land includes information about the location, boundaries and area of land parcels and apartment units registered, including information about the existence of buildings or parts of buildings on it²¹. Physical data updating is part of land registration activities intended for adequate completeness in the implementation and continuity in data maintenance as a form of data available is the latest or current data accompanied by the obligation to register and record changes that occur in the future²². This update is very important to be maintained and maintained so that the accuracy of the data with the current situation is in accordance with the latest principles²³. When there is a change in land data, whether it is related to the transfer of rights or splitting, the data in the rights must be updated by recording in the land book and certificate at the local Land Office²⁴.

The up-to-date principle becomes a principle that is so bound in maintaining data with the demands of maintaining land registration data continuously and continuously, so that the data

¹⁹ Harry Soepandi and Putranto Hari Widodo, "Perancangan Sistem Informasi Pertanahan Buku C Desa Berbasis Web Di Desa Satriyan Kec.Tersono Kabupaten Batang", *IC Tech XVI*, No. 4 (2021):

²⁰ Zahroh Dzakiyyur Roikhah, *Pelaksanaan Pendaftaran Tanah Sistematis Lengkap (Studi Pelaksanaan Pendaftaran Tanah Di Desa Klunjukan Kecamatan Sragi Kabupaten Pekalongan*, (Universitas Islam Sultan Agung, 2024).

²¹ Pasal 1 Angka 6 Peraturan Pemerintah Nomor 24 Tahun 1997 tentang Pendaftaran Tanah, Lembaran Negara Republik Indonesia Nomor 59 Tahun 1997

²² Pasal 12 ayat (2) Peraturan Pemerintah Nomor 24 Tahun 1997 tentang Pendaftaran Tanah.

²³ I Gusti Ayu Ketut Rachmi Handayani, Henning Glaser, Mohd Rizal Palil, And Fatma Ulfatun Najicha, "The Regulatory Formulations Of Central Java And East Java Watershed: Strengthening Local Government In Legislative Drafting Practices Towards Green Legislation", *International Journal of Business, Economics and Law* 14, No. 4 (2017): 225-229.

²⁴ I Gusti Ayu And Others, "2019 Harmonizing The Rights Of Water Resources Regulation Based On Ecological Justice", *South East Asia Journal Of Contemporary Business, Economics And Law*, 20, No. 4 (2019): 5-10.

is stored at the Land Office by trying to match the real situation in the field. Maintenance of land registration data is carried out if there are changes in physical data and juridical data on registered land registration objects²⁵. This maintenance is carried out by demanding the maintenance of juridical data and physical data with each application submitted, the applicant attaches several documents in the form of application formular, power of attorney if authorized, photocopy of applicant's identity, original certificate, photocopy of current year PBB SPPT, proof of payment of fees charged as mandatory documents and other documents as supporting documents²⁶.

Updating physical data through land registration data maintenance activities is accompanied by the obligation to register changes that occur for right holders. This obligation, however, is not accompanied by sanctions for failure to maintain land registration data. As a result, this existing obligation hangs in the balance because there is no compulsion to obey and comply with existing regulations²⁷.

Changes to physical data can take several forms, namely: First, land division. In splitting this land parcel must turn off the parent certificate, so that there is no double certificate. So that the old land parcel master number is deleted and a new parcel master number is made on each land resulting from the division of the land parcel. Second, the separation of part or several parts of the land parcel. The difference between splitting and separation is that in one land parcel that is partially or partially separated, there is a new parcel that has the same legal status as the parent land parcel, but does not kill the parent certificate so that it remains valid. However, there are changes to the size of the parcel and its boundaries. The new parcel is made a measurement letter, land book and certificate as a new parcel of land and on the registration map, land register, measurement letter, land book and certificate a note is affixed regarding the separation of land.

Third, the merger of two or more parcels of land. This land merger has an inverse nature with splitting and separation, namely combining more than one parcel of land into one parcel of land due to the request of land rights holders on two or more parcels of land that have been registered with the same status of rights and the same period of time. This merger creates a new measurement letter, land book, and certificate by deleting the original measurement letter, land book and certificate.

B. Computerization and Digitalization of Village Land Administration

Land administration is a complex area, especially in terms of achieving legal certainty and administrative order. In public administration theory, hierarchical structures, clear rules and established procedures are important to improve efficiency and fairness. This theory will help understand the importance of an organized and transparent system in reducing conflicts and increasing legal certainty²⁸. The function of the village register in realizing orderly land administration by encouraging active community involvement in the administrative process with the village register mechanism in increasing transparency and accountability²⁹. Active community involvement not only increases transparency and accountability, but also helps to reduce land conflicts, improve data accuracy and strengthen community ownership and trust in the land administration system. Direct community involvement, coupled with adequate education and training can promote orderly and effective land administration.

²⁵ Pasal 36 Peraturan Pemerintah Nomor 24 Tahun 1997 tentang Pendaftaran Tanah. Lembaran Negara Republik Indonesia Nomor 59 Tahun 1997.

²⁶ I. Gusti Ayu Ketut Rachmi Handayani And Others, "Politik Of Legislation In Indonesia About Forestry And The Mining Activity Permit In The Forest Area Of Environmental Justice", *Journal Of Engineering And Applied Sciences* 13, No. 6 (2018): 1430-1435.

²⁷ Himawan Ardi Nugroho, Wida Astuti, "Penerapan Asas Mutakhir Dalam Pemeliharaan Data Pendaftaran Tanah Pada Badan Pertanahan Nasional Kabupaten Sragen", *Journal Discretie* 1, No. 2 (2020): 102-113.

²⁸ Vallensia Mizatul Khair, Wahib Assyahri, "Optimalisasi Administrasi Pertanahan di Indonesia: Tantangan dan Strategi Menuju Kepastian Hukum", *Journal of Public Administration* 2, No. 2 (2024): 55-62.

²⁹ Thalia Bella, Herman Najoan, Neni Kumayas, "Fungsi Register Desa Dalam Mewujudkan Tertib Administrasi Pertanahan (Studi di Desa Sinisir Kecamatan Modinding Kabupaten Minahasa Selatan)" *Jurnal Jurusan Ilmu Pemerintahan* 3, No. 3 (2019):

Technological developments make digital spatial data management possible through a web-based system so that data access, input to processing and presentation can be done without space and time limits. The development of high-resolution satellite image technology facilitates and accelerates efforts to unify existing land registration maps. The land registration map is a derivative of the registration base map. The main requirement in building a single map is to provide the latest satellite imagery or aerial photographs. The single land map must be sourced from large-scale imagery so that it can display land parcels.

Digitalization of the land system is a strategic step. Through geospatial technology and an integrated web-based land information system, it can improve data accuracy, speed up administrative processes and increase transparency. Digitalization also promotes the opportunity to create an integrated land database that can be accessed in real time, reducing the potential for data manipulation and ownership conflicts. Although, the process of transitioning from a manual system of land administration to a digital system requires significant financing and a significant change in work culture³⁰. This includes procurement of technological infrastructure, training of human resources, and socialization to the community. These challenges are not only technical but also social and cultural. A comprehensive strategy is needed to overcome resistance to change and ensure effective technology adoption.

The principles of agrarian reform need to be integrated into a comprehensive land law framework. The goal is of course to create a fair land distribution and provide broad access to land resources for the community. Not only land redistribution but also aspects of community empowerment, increased land productivity, and environmental protection. This agrarian reform will be effective in catalyzing rural development and poverty alleviation³¹. Protection of community land rights must be a priority in any effort to reform and digitize the land system. Protection of smallholders and guarantee of equitable access to land resources. This includes effective grievance and dispute resolution mechanisms that need to be developed to protect community rights³².

V. Conclusion

The administration of village land data through the Digital Measurement Model is expected to improve the validity and accuracy of village land data. In addition, digitalization can also facilitate access to land information for the community and village government. Thus, it is expected to create legal certainty and order in village land administration. This model has been implemented in Panembangan Village, Cilongok District, Banyumas Regency. The model is the result of a multidisciplinary approach between land law science, supported by land mapping science and informatics engineering. The Digital Measurement Model has two main focuses, namely updating the juridical data of village land and updating the physical data of village land. Juridical data updating is carried out using survey and interview methods to obtain information on land ownership, land history, and proof of land ownership. Physical data updating is carried out by utilizing land mapping and measurement technology to obtain information on land area, land boundaries, and land location.

Acknowledgement

This research was funded by the Ministry of Education, Culture, Research and Technology through the Directorate of Research, Technology and Community Service in 2024. Community Service, Community Based Empowerment scheme, 2024, Contract Number 075/E5/PG.02.00/PM.BARU /2024

³⁰ Muslikan, B. A., "Kebijakan Pelayanan Publik Dalam Penyelenggaraan Layanan Pertanahan Akhir Pekan (PELATARAN)", *Law, Development and Justice Review* 6, No. 1 (2019): 66-81.

³¹ Indri Meiliawati, "Digitalisasi dan Reformasi Hukum Dalam Tata Kelola Pertanahan Di Indonesia", *Jurnal Kajian Hukum* 3, No. 1 (2024):

³² Silviana, A, "Urgensi Sertipikat Tanah Elektronik Dalam Sistem Hukum Pendaftaran Tanah di Indonesia", *Administrative Law and Governance Journal* 4, No. 1 (2021): 51-68.

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