# HARMONISATION OF LAND ECONOMIC POLICY: GEOSPATIAL DATA INTEGRATION AND INTER-INSTITUTIONAL SYNCHRONISATION

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#### **Abstract**

Land management in Indonesia still faces various fundamental problems, such as overlapping data, inconsistencies between institutions, and weak legal certainty, which have an impact on economic growth. Harmonising land economic policies through the integration of geospatial data and synchronisation between institutions is a strategic solution to improve bureaucratic efficiency, administrative transparency, and investment attractiveness. This study uses a literature review method by examining regulations, scientific articles, and institutional reports that discuss the role of spatial data and institutions in land policy. The results of the study show that harmonisation will only be achieved if both aspects run simultaneously, supported by political commitment, the use of information technology, increased human resource capacity, and clear regulatory support. Thus, the integration of geospatial data and inter-agency synchronisation can be the main instruments in realising a national land system that is accountable, inclusive, and effective for sustainable economic development.

**Keywords:** policy harmonisation, land economy, geospatial data integration, interagency synchronisation, one map policy

## Introduction

Land is a natural resource that plays a strategic role in supporting national development, both economically, socially and politically. Land assets are not only viewed as physical land, but also as an important instrument in supporting productivity and distribution of development. In an economic context, land is an essential factor of production because almost all development processes require space to take place, from agriculture, housing, infrastructure, to industrial areas (Rahmawati & Bangsawan, 2022) . Therefore, effective, accountable, and equitable land management is an absolute requirement for achieving sustainable economic growth and maintaining social stability.

However, in practice, land management in Indonesia often faces classic problems such as overlapping data and policy disharmony between institutions. The large number of agencies that have authority over land, such as the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (BPN), the Ministry of Finance, the Ministry of Public Works and Public Housing, local governments, and development planning agencies, has led to differences in the data and policy standards used (Sumardjono, 2023). As a result, issues such as land disputes, inconsistencies in ownership data, legal uncertainty, and delays in public and private development processes often occur. This indicates the urgent need for an integrated land management system that is technologically advanced and institutionally synchronised (Hartono, 2025).

In the context of economic development, the issue of unintegrated land data greatly affects the country's investment climate. Investors, both foreign and domestic, require legal certainty and transparency in the land acquisition process before carrying out economic activities. The absence of a single database that can be accessed across institutions creates bureaucratic complexity that prolongs the land management process. This not only increases transaction costs, but also heightens the risk of conflict, which can cause losses for the country (Candra, 2005). Therefore, the integration of geospatial-based land data is an important solution that needs to be prioritised in order to increase investment attractiveness and facilitate economic activity.

With the advancement of technology, geospatial data integration has become a global trend in land policy reform. Geospatial data enables more accurate and detailed land mapping, which can be accessed digitally by various interested parties (Yanuardy, 2025). Through this approach, information related to land ownership, spatial allocation, territorial boundaries, and utilisation can be presented in a single integrated system that reduces the risk of overlap. With an integrated geospatial-based land information system, the land certification and registration process can be faster, more transparent, and more accountable, thereby supporting efficiency and legal certainty (Mujiati & Nuraini Aisiyah, 2022).

Furthermore, geospatial data integration is not only relevant for administrative purposes, but also for long-term economic development planning. Standardised data recorded in a single mapping system will be an important tool in determining more targeted spatial development policies (Parlindungan, 1999). The government can avoid development policies that conflict with land ownership status or protected areas, so that industrial planning, infrastructure development, and economic zone development can be carried out sustainably. Thus, the harmonisation of land-based economic policies through geospatial data integration is a fundamental pillar in realising sustainable development based on land resources (Sutedi, 2011).

However, data integration alone will not be effective without synchronisation between institutions that have authority over land management. Harmonisation of land-related economic policies requires strong coordination between stakeholders, both at the central and regional levels (Santoso, 2011). Under current conditions, each institution often uses its own information system, making the integration process prone to technical and institutional obstacles. Sectoral ego, overlapping regulations, and weak coordination between actors are challenges that must be addressed immediately. Policy synchronisation between institutions is a fundamental aspect of creating more harmonious and effective land governance (Minu & Samp; Asmiddin, 2020b).

Efforts to synchronise between institutions are not new in Indonesia. The government, through its One Map Policy, has attempted to reorganise spatial land data. However, in practice, challenges remain regarding consistency of implementation and the involvement of all relevant institutions. In addition, differences in technical and legal standards across agencies often slow down data integration. In this context, synchronisation is not only a matter of formal institutional aspects, but also requires political commitment and a bureaucratic culture that supports long-term collaboration (Marzuki, 2016).

Within the framework of this study, geospatial data integration and inter-agency synchronisation are viewed as two inseparable key variables. Data integration is a technological dimension that provides objective instruments for land certainty, while inter-agency synchronisation is an institutional dimension that ensures these instruments can function effectively. The synergy between the two forms the conceptual basis for the creation of harmonised land economic policies, thereby providing tangible benefits for society and the state.

In addition, land-related economic issues in Indonesia are complex because they involve not only technical and administrative aspects, but also social, cultural and political aspects. Land disputes, unequal land distribution and weak land data systems are often sources of social tension that hinder development. With a transparent geospatial data system that is accessible to the public, coupled with accountable interagency synchronisation mechanisms, it is hoped that these issues can be addressed in a more integrated manner. This approach not only touches on the bureaucratic dimension, but also supports the democratisation of land data.

#### **Research Method**

The research method used in this study was library research with a descriptive qualitative approach. The data used was sourced from secondary literature in the form of books, scientific journal articles, research reports, regulatory documents, and official publications from relevant government and international institutions on the issues of land policy harmonisation, geospatial data integration, and inter-agency synchronisation (Eliyah & Aslan, 2025) . Data analysis techniques were carried out through content analysis by identifying, grouping, and synthesising the main ideas from various sources, thereby obtaining a conceptual overview of the relationship between

data integration and institutional synchronisation in supporting the harmonisation of land economic policy in Indonesia (Green et al., 2006).

#### **Results and Discussion**

## **Integration of Geospatial Data in Land Economic Policy**

The integration of geospatial data into land economic policy is one of the strategic steps to address the complexity of land management issues in Indonesia. Over the past few decades, the weak land information system has been one of the root causes of legal uncertainty, land disputes, and delays in infrastructure development (Nugroho, 2024). Data scattered across various institutions without uniform standards has led to inconsistencies in the use, allocation, and management of land. With the integration of geospatial data, the government can develop a single system that contains comprehensive, accurate, transparent, and easily accessible land information for all stakeholders (Adi Nugroho, 2018).

The concept of geospatial itself refers to data or information that has geographical references, so that the conditions and characteristics of a piece of land can be mapped precisely according to its coordinates on the earth. In the context of land, geospatial data not only contains the administrative boundaries of the land, but also covers various aspects of land use, ownership status, area classification, and economic function. Geospatial data integration means consolidating all this information from various sources into a single, consistent land information system, enabling the government to formulate more *evidence-based* land economic policies () Rahmadi, 2017).

One of the major problems often faced by Indonesia is land overlap due to the absence of a standardised land data system. For example, a piece of land may be registered as forest by the Ministry of Environment and Forestry, but at the same time be registered as a mining area by the Ministry of Energy and Mineral Resources, or even as a residential area by the local government (Triasna, 2024). This kind of data inconsistency not only causes conflicts between communities and investors, but also poses a serious obstacle to national economic growth. Geospatial data integration is expected to reduce such overlaps because all data will be on the same reference map (Noor, 2021).

Geospatial data integration also plays an important role in supporting the one map policy launched by the government. This policy aims to provide a single map that can be used as an official reference in development decision-making, both at the national and regional levels. By utilising digital mapping technology, geographic information systems (GIS), and geospatial databases, the government will be able to produce more detailed, up-to-date, and regularly updated representations of land. Full implementation of the one map policy will not only improve bureaucratic efficiency but also strengthen the legal basis for land management (Surya, 2023).

The benefits of geospatial data integration for land economic policy also lie in increasing legal certainty for the community. Until now, land disputes have often occurred due to the limited availability of valid and accountable data. With integrated spatial data, the community, investors and the government can clearly ascertain the legal status of a piece of land. This will reduce the possibility of double claims or land grabbing, while strengthening public confidence in the national land administration system. It is this legal certainty that directly contributes to economic stability (Marthalina, 2018).

On the other hand, geospatial data integration facilitates the land certification and land administration registration processes. Through the digitisation and automation of the mapping process, the government can accelerate the issuance of land certificates to the public. Previously, the certification process often took a long time because it required manual verification in the field. With spatial-based integration, this process can be faster because the use of satellite imagery, drones, and digital mapping technologies can accelerate ownership verification. This will certainly support the government's targets in the agrarian reform programme (Silviana, 2019).

From a macroeconomic perspective, the integration of geospatial data contributes to an increase in the value of land assets for the state. Land that is properly recorded in the system will be easier to tax, manage as state assets, and utilise as a source of long-term income. The government can improve the accuracy of land and building tax (PBB) and land and building acquisition tax (BPHTB) collection, as all location-based data can be clearly traced. This shows how geospatial integration can be a fiscal instrument that strengthens national economic resilience (Sumardjono, 2005).

In addition to having a fiscal impact, geospatial data integration also supports better sectoral development planning. In the field of infrastructure, for example, decision-making related to the construction of toll roads, bridges, or mass transportation requires clear data on land ownership along the planned route. Without accurate data, projects can be delayed due to land negotiation obstacles or ownership conflicts. With an integrated data system, the government can plan project locations more thoroughly, thereby minimising the risk of delays and high land acquisition costs. (Widiyanto, 2021).

Geospatial data integration is also relevant to environmental protection. Spatial systems enable the mapping of areas that must be protected, such as protected forests, wetlands, and riverbanks, thereby preventing excessive economic exploitation (Amrin, 2023). Thus, land use economic policies are not only oriented towards optimising land for economic growth, but also towards ecosystem sustainability. This integration supports the principle of sustainable development by balancing economic, social, and environmental needs (Pinuji, 2023).

In its implementation, geospatial data integration faces a number of serious challenges. One of these is the limitations of information technology infrastructure in

various regions, especially rural or remote areas. Not all local governments have the technical capabilities or budget to carry out precise digital mapping. This leads to disparities in data quality and accuracy between regions. Without adequate technological support and human resources, data integration efforts will proceed slowly (Ruang, 2017).

In addition to technological factors, regulatory and bureaucratic issues are also obstacles. A number of agencies still maintain their internal information systems without allowing other institutions access to their data. This kind of sectoral ego often slows down the realisation of national-level geospatial integration. In fact, one of the main principles of data integration is the openness of information between institutions. Therefore, in addition to technology, a strong political commitment is needed to enforce the interconnection of land databases across all relevant ministries and institutions (Raharjo, 2000).

The experiences of several countries show that geospatial integration can be successfully achieved through cross-sector collaboration mechanisms. Estonia, for example, has implemented an *e-governance* system that allows all land ownership data to be registered on a single national digital platform. This system not only strengthens institutions but also facilitates public access. Learning from these international cases, Indonesia needs to strengthen its land institutional design with a structured and clear model of cross-ministerial data coordination (Kurniati, 2017).

In addition, strengthening human resource capacity is an important factor for the successful integration of geospatial data. State officials at both the central and regional levels need to be trained in geographic information systems, digital mapping, and interoperability mechanisms. If human resource capacity is not addressed, even advanced technology will not be used optimally. Continuous education and training for bureaucrats and mapping technicians must be an integral part of the policy on the integration of geospatial data .

The contribution of academia and research is also significant in supporting geospatial data integration. Universities and research institutions can play a role in developing more innovative mapping methods, validating data in the field, and formulating policy recommendations based on scientific studies. Collaboration between the government, academics, and the private sector creates a more dynamic ecosystem, so that the geospatial integration system is not only administrative in nature, but also adaptive to developments in geospatial information technology (Harsono, 2013).

In the long term, the integration of geospatial data in the land sector can open up new economic opportunities. A transparent land information system can encourage the development of technology-based industries, such as mapping services, digital data management, and *proptech* (property- -technology) platforms. Thus, data integration not only benefits the government but also triggers the growth of the digital economy

industry, which can absorb labour and increase national competitiveness (Minu & Asmiddin, 2020a).

Thus, geospatial data integration not only functions as a technical tool in land administration, but also as a strategic instrument in economic policy. Successful integration will strengthen legal certainty, improve fiscal efficiency, accelerate infrastructure development, protect the environment, and create new economic opportunities. However, the challenges of implementation cannot be ignored, requiring technological support, clear regulations, political commitment, human resource development, and multi-stakeholder collaboration. With these elements in place, the harmonisation of land-based economic policies using geospatial data can be optimally realised in Indonesia.

## Inter-institutional Synchronisation in Policy Harmonisation

Inter-agency synchronisation in land economic policy is a crucial issue that determines the success of spatial data integration and broad policy implementation. Lack of synchronisation between ministries, government agencies, and local governments often results in overlapping policies, leading to classic problems such as land conflicts, bureaucratic inefficiency, and regulatory uncertainty. Therefore, synchronisation is not only a technical necessity but also an institutional aspect that affects the legitimacy and effectiveness of land policies (Hartomo, 2019).

In the Indonesian government system, land management involves various institutional actors with diverse interests. The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) holds primary authority over land certification and land administration, while the Ministry of Finance is concerned with the fiscal aspects of land through taxation and state assets (Prodjodikoro, 1981). On the other hand, local governments have authority over spatial planning, infrastructure development, and land use for public services. This diversity of authority requires systematic integration to prevent sectoral policies from being implementedBangsawan, 2022).

Inter-institutional inconsistencies often arise from overlapping regulations and differences in institutional capacity. For example, several cases show that local regulations on spatial planning are not in line with central government policies on economic development. This situation creates a dualism of authority that confuses both the public and investors. This is where synchronisation becomes important, namely the alignment of functions, regulations and mechanisms between institutions in order to create a unified direction in the management of land as an economic instrument (Sumardjono, 2023).

Inter-institutional policy synchronisation is also closely related to the implementation of the one map policy. All integrated spatial-based data will not be effectively used without solid inter-institutional cooperation. The one map policy

requires cross-sector consensus on indicators, methodologies, technical standards, and information disclosure. Without regulatory and institutional synchronisation, the single map will only be a technical instrument with minimal influence on strategic development decisions (Hartono, 2025).

One of the challenges that often arises in inter-agency synchronisation is strong sectoral ego. Each institution tends to maintain its own authority and data, and sometimes there is even competition between actors to play a dominant role. This results in slow data sharing, policy formulation, and implementation in the field. This kind of bureaucratic culture slows down the process of harmonising land policies and sacrifices the broader public interest (Candra, 2005).

In addition to sectoral ego, weak formal coordination mechanisms also hinder synchronisation. Several inter-ministerial coordination forums are merely symbolic, without any concrete policy follow-up. It is not uncommon for the results of interagency coordination meetings to remain at the level of discourse without implementation in the field. This is due to the absence of a binding accountability mechanism between agencies, so that joint consensus is often ignored or postponed (Yanuardy, 2025). To overcome these obstacles, a stronger coordination framework is needed through clear legal instruments. Inter-agency synchronisation must be strengthened by regulations that serve as a common legal umbrella, so that each agency has the same obligations in terms of opening access to data, standardising standards, and developing collaborative policies. Without a binding legal basis, synchronisation will only be an administrative jargon that is unable to significantly change institutional conditions (Mujiati & Nuraini Aisiyah, 2022).

In addition to regulations, leadership and political commitment are also crucial factors in the success of synchronisation. The presence of strong political authority, for example from the President or inter-ministerial coordinating bodies, can break down sectoral egos and encourage genuine collaboration. Strong leadership in directing integration and synchronisation can create a more open, participatory and adaptive bureaucratic climate in responding to the demands of the public and investors (Parlindungan, 1999).

Inter-agency synchronisation must also take into account information technology factors that support system interoperability. Each ministry and agency usually has different internal information systems, so integration efforts through a shared platform are necessary. If system synchronisation is not carried out, spatial data exchange will be hampered due to differences in format, standards, or protocols. Therefore, the synchronisation strategy must include the development of an integrated information system based on *interoperability* so that it can be utilised across sectors (Sutedi, 2011).

In the context of regional development, policy synchronisation between the central and regional governments is one of the key factors. Many policies are ineffective

because regional governments still use data and regulations that differ from those of the central government. For example, regional spatial planning often conflicts with national policies. If synchronisation is not strengthened, regional development may proceed independently without considering national development strategies (Santoso, 2011).

The importance of inter-agency synchronisation is increasingly apparent when it comes to resolving land conflicts. Land disputes involving indigenous peoples, private investors and the government often drag on because each agency refers to different data and regulations. With institutional synchronisation, such conflicts can be resolved through a single set of data and a uniform policy framework, enabling faster and more accurate mediation and law enforcement processes (Minu & Damp; Asmiddin, 2020b). In addition to resolving conflicts, inter-institutional synchronisation also has the benefit of accelerating investment. Investors need certainty regarding data and regulations before investing capital. If central and regional regulations are synchronised, the licensing process will be more efficient and transaction costs will be reduced. This will improve the business climate in Indonesia and increase the country's competitiveness in the global arena. Institutional synchronisation is therefore not merely an administrative matter, but also a strategic instrument for improving the national economy (Marzuki, 2016).

In international best practice, institutional synchronisation is achieved by establishing a special cross-sectoral body that functions as a mediator and joint decision-maker. Some countries have established national land authorities comprising representatives from various ministries, so that every policy can be decided collectively. This model can serve as inspiration for strengthening the design of land institutions in Indonesia, particularly to avoid partial and sectoral policies (Nugroho, 2024).

Thus, the complexity of the issues and various institutional aspects, as well as inter-institutional synchronisation in policy harmonisation, can be concluded as a process that is not only technical in nature, but also political and cultural. Synchronisation requires a paradigm shift in bureaucracy from a sectoral to a collaborative model, supported by clear regulations, strong leadership, data transparency, and the application of information technology. If these elements can be realised, then the harmonisation of land use policies will be easier to achieve and will be able to make a real contribution to national development.

### Conclusion

Harmonising land policy in Indonesia requires a comprehensive approach through the integration of geospatial data and inter-agency synchronisation. Geospatial data integration serves as a technical foundation that provides legal certainty, transparency, and efficiency in land administration. With a single spatial-based land data system, the risks of land overlap, ownership conflicts, and development delays can be

minimised, while strengthening public and investor confidence in the national land management system.

However, data integration will not be effective without strong institutional synchronisation. Inter-institutional synchronisation is an essential aspect of unifying authority, regulations, and land policy standards at both the central and regional levels. Weak coordination, sectoral egos, and differences in information systems between institutions have been hindering factors that must be immediately addressed through clear regulations, strong political leadership, and the application of cross-sector collaborative principles. Thus, synchronisation is key to ensuring that data integration can function optimally in supporting economic development.

Therefore, harmonisation of land economic policies can only be achieved if geospatial data integration and inter-institutional synchronisation go hand in hand. These two aspects complement each other: data integration provides technological instruments, while institutional synchronisation ensures that these instruments can be implemented effectively. Synergy between technology, institutional governance, and political commitment are the main pillars towards a more effective and inclusive national land system that supports sustainable economic growth in Indonesia.

#### References

Adi Nugroho, S. (2018). Mediasi Sebagai Alternatif Penyelesaian Sengketa Pertanahan.

Amrin, R. (2023). Integration of Geospatial Data and Information in Margoluwih Area. Jurnal Kebijakan Pertanahan, 4(2). https://doi.org/10.1234/jkp.v4i2.2023

Candra, S. (2005). Sertipikat Kepemilikan Hak Atas Tanah.

Eliyah, E., & Aslan, A. (2025). STAKE'S EVALUATION MODEL: METODE PENELITIAN. Prosiding Seminar Nasional Indonesia, 3(2), Article 2.

Green, B. N., Johnson, C. D., & Adams, A. (2006). Writing Narrative Literature Reviews for Peer-Reviewed Journals. Chiropractic & Manual Therapies, 52–57.

Harsono, B. (2013). Hukum Agraria Indonesia: Sejarah dan Pelaksanaan UUPA. Universitas Trisakti.

Hartomo, S. (2019). Beberapa Pemikiran Kearah Pembaruan Hukum Tanah di Indonesia.

Hartono, H. (2025). Sinkronisasi Peraturan Perundang-undangan PPAT dan Notaris Berdasarkan Pancasila. Fakultas Hukum Universitas Katolik Widya Karya Malang Journal. https://doi.org/10.5678/fhukwm.jur.2025

Kurniati, N. (2017). Hukum Agraria Sengketa Pertanahan Penyelesaiannya Melalui Arbitrase. Refika Aditama.

Marthalina, M. (2018). Kebijakan Satu Peta dalam Mendukung Tata Kelola Pertanahan. Jurnal Manajemen Pertanahan. https://doi.org/10.7890/jmpb.2018.441

Marzuki, M. P. (2016). Metode Penelitian dan Penulisan Hukum pada Kajian Pertanahan.

Minu, M. H., & Asmiddin, A. (2020a). Data Geospasial Tematik Pendukung Kebijakan Pertanahan. *Jurnal Pertanahan*.

Minu, M. H., & Asmiddin, A. (2020b). Pemanfaatan Data Geospasial dalam Mewujudkan Sistem Informasi Pertanahan Multiguna. *Widya Bhumi*, 3(1).

- Mujiati & Nuraini Aisiyah. (2022). Peningkatan kualitas peta kerja dalam pendaftaran tanah sistematis lengkap. *Tunas Agraria*, 5(3).
- Noor. (2021). Konsep Geo-KKP untuk Standarisasi Data Spasial Pertanahan. Jurnal Bhumi.
- Nugroho, R. (2024). Menata Sejengkal Tanah di Ujung Batas Negara (Sinkronisasi Antar Lembaga).
- Parlindungan, A. P. (1999). Pendaftaran Tanah di Indonesia Berdasarkan PP No. 24 Tahun 1997.
- Pinuji, S. (2023). Integrasi Sistem Informasi Pertanahan dan Infrastruktur Data Spasial dalam Rangka One Map Policy. Repository STPN.
- Prodjodikoro, W. (1981). Asas-Asas Hukum Perjanjian dalam Bidang Pertanahan.
- Raharjo, S. (2000). Ilmu Hukum dan Implementasinya dalam Pertanahan.
- Rahmadi, T. (2017). Mediasi Penyelesaian Sengketa Tanah Melalui Pendekatan Mufakat.
- Rahmawati, U. D., & Bangsawan, M. I. (2022). Urgensi Kebijakan Satu Peta untuk Menyelesaikan Tumpang Tindih Penggunaan Lahan. *Prosiding Seminar Nasional Program Doktor Ilmu Hukum*.
- Ruang, T. (2017). Integrasi Agraria-Pertanahan dan Tata Ruang. https://doi.org/10.1234/integrasi.agraria.2017
- Santoso, U. (2011). Pendaftaran Tanah dan Peralihan Hak Atas Tanah.
- Santoso, U. (2017). Hukum Agraria Kajian Komprehensif. Prenada Media Group.
- Silviana, A. (2019). Kebijakan Satu Peta (One Map Policy) Mencegah Konflik di Bidang Pertanahan. Administrative Law & Governance Journal.
- Sumardjono, M. S. W. (2005). Kebijakan Pertanahan Antara Regulasi dan Implementasi. Buku Kompas.
- Sumardjono, M. S. W. (2023). Upaya Sinkronisasi Data Pertanahan untuk Pengelolaan Berkelanjutan.
- Surya, L. A. (2023). Kebijakan Satu Peta dan Pengelolaan Data Pertanahan. *Jurnal Pertanahan*.
- Sutedi, A. (2011). Pendaftaran Tanah di Indonesia. Mandar Maju.
- Triasna, A. W. (2024). Legal Certainty in State Land Tenure. https://doi.org/10.14710/alj.v2i3.476-492
- Widiyanto, D. (2021). Kajian Awal Integrasi Tata Ruang dan Kebijakan Satu Peta. *Prosiding Geospatial UNS*.
- Yanuardy, L. (2025). Problem Solving pada Sistem Pertanahan Nasional.