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ONE MAP, MANY INTERESTS: SPATIAL GOVERNANCE FRAGMENTATION AND INTERSECTORAL POLITICS IN KAMPAR REGENCY, INDONESIA

Zaki Helmi[1], Muh. Aris Marfai[2], Agus Heruanto Hadna[3] & Ahmad Maryudi[4]

[1]Graduate School - Leadership & Policy Innovation, Universitas Gadjah Mada – Indonesia
Email: helmizaki832@gmail.com
Orchid: https://orcid.org/0009-0007-3270-1652
[2]Faculty of Geography, Universitas Gadjah Mada – Indonesia & Swasaba Research Initiative (SRI)
Email: arismarfai@ugm.ac.id
Orchid: https://orcid.org/0000-0003-4581-6217
[3]Graduate School - Leadership & Policy Innovation, Universitas Gadjah Mada – Indonesia
Email: hadna@ugm.ac.id
Orchid: https://orcid.org/0000-0003-0281-983X
[4]Graduate School - Leadership & Policy Innovation, Universitas Gadjah Mada – Indonesia
Email: ahmad_maryudi@ugm.ac.id
Orchid: https://orcid.org/0000-0001-5051-7217

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Corresponding Author: Zaki Helmi (helmizaki832@gmail.com)

ABSTRACT

The implementation of the One Map Policy (OMP) in Kampar Regency (Riau Province, Indonesia) demonstrates that spatial data integration is not merely a technocratic agenda, but also a political and institutional process shaped by local power configurations, bureaucratic capacity, and intersectoral relations. Field findings reveal that fragmentation in spatial land governance is reflected in overlapping reference maps across sectors, resistance to data standardization, and weak coordination among regional government agencies. Although national regulations promote geospatial interoperability, implementation at the field level remains uneven due to differing institutional interests, dependence on technology vendors, and the absence of strong accountability mechanisms for data management. The analysis further shows that middle managers play a crucial role as policy translators, influencing the pace and direction of implementation through internal adjustment strategies, while technical actors introduce dynamic street-level interpretations of One Map standards. Overall, the OMP implementation in Kampar reflects a hybrid process of digital innovation, political negotiation, and institutional reconstruction. This study concludes that the success of the One Map Policy requires adaptive governance designs, strengthened data management capacity across regional government agencies (OPDs), and spatial integration mechanisms capable of reducing friction among sectoral authorities.

KEYWORDS: One Map Policy, Land Governance, Spatial Planning, Cross-Sectoral Coordination, Policy Implementation.

1. INTRODUCTION

Public policy implementation is a crucial stage because it determines the extent to which policy objectives can be realized in practice (Ansell and Gash 2008; Holt and Morris 2022; Iswahyudi 2020; Public, Houghton, and Company 2003). In the context of land use, implementation requires accurate spatial data integration, cross-sector coordination, and evidence-based decision-making mechanisms to minimize conflict and ensure legal certainty (Kraft and Furlong 2022; William N. Dunn 2011). The One Map Policy emerged as a strategic solution to overlapping spatial use, spatial data disharmony, and conflicting authorities in land resource governance in Indonesia (Ramadani et al. 2019; Science and Maryudi 2019). This policy mandate began in 2010 and was strengthened through Presidential Regulation No. 9 of 2016 and Presidential Regulation No. 23 of 2021, with the aim of establishing a single geospatial reference base through a 1:50,000-scale national geoportal (Dwiki Ridhwan, Muis Fajar, Adi Pradana 2019; Kemenko 2021; Silviana 2019; Ulfah Dwi Rahmawati 2022). Although geoportal began operating in 2018, implementation at the regional level still faces technical, institutional, and data interoperability barriers (Kompas.id, 2024).

At the local level, implementation gaps are evident. BIG data (2023) shows that only 14 out of more than 500 regencies/cities excel in managing the Regional Geospatial Information Network (JIGD). Kampar Regency, which has had a network node since 2021 (Dinas Kominfo dan Persandian Kampar 2021), still faces limited human resources, minimal budget support, weak cross-sectoral coordination, and technical obstacles to data integration and synchronization. Its empirical impacts are evident in overlapping spatial plans, limited access to cross-sectoral data, and uncertainty regarding land law, including the finding that 80% of community oil palm plantations are located within protected forest areas (Iswahyudi 2020; Iswahyudi et al. 2020). Various studies highlight technical and institutional implementation barriers, such as weak regulations, technological interoperability mechanisms, the absence of data standards, and the low capacity of human resources in geospatial management (Indonesia 2018; Koto and Ningsih 2024; Ramadani et al. 2019). Furthermore, implementation effectiveness is also influenced by cross-actor coordination, implementing capacity, and receptivity to digital innovation (Loffreda et al. 2024; Sumarsyah 2025).

Previous studies have emphasized the strategic benefits of the One Map Policy in synchronizing spatial data, resolving agrarian conflicts, and supporting the digital transformation of spatial governance (Kurniawan and Kurniawan 2023; Pelengkahu 2022; Silviana 2019; Wahyuningsih 2024). However, implementation barriers persist, including limited public transparency, independent data verification, and community participation in spatial governance (Virgy, Ummah, and Mikail 2024). Based on these conditions, this study focuses on the implementation of the One Map Policy in land use in Kampar Regency, with the aim of analyzing the technical, institutional, and coordinative challenges that impact the effectiveness of spatial data utilization. This study is important to provide an empirical overview of how national policies can be translated into practice at the local level, including their impact on resolving land overlap, legal certainty, and cross-sectoral data access.

2. LITERATURE REVIEW

2.1. One Map Policy and Land Governance

The One Map Policy is a strategic effort by the Indonesian government to unify various spatial data sources from different sectors and agencies into a single geospatial reference (Ramadani et al. 2019; Science and Maryudi 2019). The main objectives of this policy are to reduce overlapping spatial use, increase land legal certainty, and support evidence-based decision-making at the national and regional levels (Iswahyudi 2020; Silviana 2019; Ulfah Dwi Rahmawati 2022). Theoretically, the effectiveness of spatial policy implementation depends on the ability of geospatial information systems to produce accurate, consistent, and accessible data across sectors (Kemenko 2021). Key challenges to implementation at the regional level include data integration, technological interoperability, human resource capacity, and inter-agency coordination (Koto and Ningsih 2024; Ramadani et al. 2019). In the context of Kampar Regency, these issues are evident in overlapping spatial plans, limited data access, and uncertainty about land law (Iswahyudi et al. 2020).

2.2. Implementation of Public Policy

Public policy implementation is the process of translating formal policies into concrete actions on the ground, involving interactions between regulations, resources, institutions, and implementing actors (Kraft and Furlong 2022; William N. Dunn 2011). Implementation theory emphasizes the importance of three key aspects: (i) clarity of objectives and regulations, (ii) institutional and human resource capacity, and (iii) inter-actor coordination and stakeholder participation (Paul A.

Sabatier 2006). In the context of spatial policy, implementation involves technical mechanisms such as field data collection, data verification, database synchronization, and inter-agency coordination mechanisms to ensure information consistency (Pelengkahu 2022; Widartono et al. 2023). Implementation failures often arise from a lack of trained human resources, inadequate budget support, weak data standards, and coordinative barriers (Indonesia 2018; Koto and Ningsih 2024).

2.3. Institutional Capacity and Cross-Sectoral Coordination

Institutional capacity is a critical determinant of effective policy implementation, encompassing organizational capabilities in terms of human resources, budget, infrastructure, and technology (Loffreda et al. 2024; Sumarsyah 2025). In the One Map policy, cross-sector coordination is critical because spatial data originates from various agencies, from forestry, agriculture, plantations, to local governments (Kurniawan and Kurniawan 2023). Effective coordination requires formal mechanisms (data protocols, integration SOPs) as well as informal coordination (technical discussions, inter-unit communication) to resolve data conflicts and synchronize information (Virgy, Ummah, and Mikail 2024). In Kampar Regency, limited coordination between technical OPDs, village governments, and national institutions impacts the quality of implementation and the integrity of spatial data. 2.4. Spatial Data Governance Theory and Digital.

2.4. Spatial Data Governance and Digital Transformation

Digital transformation in spatial governance emphasizes the use of information technology to improve data transparency, accuracy, and accessibility (Dolata, Mateusz ; Schenk, Birgit ; Fuhrer, Jara ; Marti, Alina ; Schwabe 2020; Suzuki, Kohei; Hur 2024). The One Map Policy is an example of digital transformation that integrates sectoral data into a national geoportal platform (Coordinating Ministry for Economic Affairs, 2021). Spatial data governance theory emphasizes the importance of system interoperability, metadata standards, independent verification, and public involvement in information management (Silviana 2019; Wahyuningsih 2024). Implementation barriers, such as overlapping land use and legal uncertainty, indicate that digital transformation requires adequate institutional support and coordination at the local level.

3. METHOD

This research uses a qualitative approach with a case study strategy to explore in depth the dynamics of the implementation of the One Map Policy in Kampar Regency, because this approach allows researchers to capture processes, actor interactions, and institutional contexts that cannot be reduced to quantitative variables (Creswell and Creswell 2017). Data collection was conducted through in-depth interviews with key actor's such as technical OPD officials, regional planning officials, heads of spatial data-related fields, and local stakeholders involved in data coordination and provision, such as the Kampar Regency Regional Planning and Development Agency (BAPPEDA), the Kampar Regency Public Works and Spatial Planning Agency (PUPR), the Kampar Regency Investment and One-Stop Integrated Services Agency (DPMPTSP), the Kampar Regency Plantation Agency, the Kampar Regency Food Security Agency, the Kampar Regency Population and Civil Registration Agency, the Kampar Regency Industry and Manpower Agency, the Kampar Regency Communication, Informatics and Cryptography Agency, the Kampar Regency Cooperative, Trade and MSME Agency, the Kampar Regency Village Community Empowerment Agency, the Kampar Regency Agriculture Agency, the Kampar Regency Regional Disaster Management Agency (BPBD), the Kampar Regency Regional Development Planning Agency (Bappeda), the Kampar Regency Investment and One-Stop Integrated Services Agency, the Organizational and Governance Section of the Kampar Regency Investment and One-Stop Integrated Services Agency, Kampar Regency Regional Secretariat, World Resources Institute (WRI), Indigenous Peoples Alliance of the Archipelago (AMAN), and Pelopor Sehati Foundation, as well as representatives of the business sector in Kampar Regency.

This research was complemented by field observations during the spatial data verification process and cross-sector coordination meetings, as well as analysis of policy documents, thematic maps, the Spatial Plan (RTRW), technical reports, and meeting minutes. Informants were selected purposively, considering strategic positions within the implementation process, followed by a snowballing technique to identify relevant actors within the policy network. The validity of the findings was ensured through source triangulation, method triangulation, and member checking with key informants to ensure consistency of interpretation (Rahman 2018). Data analysis was conducted in stages following the Miles & Huberman

framework, through data condensation, categorization, and conclusion drawing. NVivo-12 software was used to code thematically on issues of institutional capacity, cross-sector coordination, and digital governance. This analytical approach enabled the identification of implementation patterns, dominant actors, and determinants of policy effectiveness, while simultaneously capturing the dynamics of bureaucratic adaptation in the application of spatial technology and data integration.

4. RESULTS AND DISCUSSION

4.1. Institutional Capacity: Foundations and Barriers to Implementing the One Map Policy in Land Governance in Kampar Regency

Field findings confirm that institutional capacity is the most critical determinant in explaining the variation in the effectiveness of One Map Policy implementation in Kampar Regency. Empirically, the spatial data integration process is strongly supported by the Public Works and Housing Agency (PUPR), the Regional Development Planning Agency (Bappeda), and the Land Agency as leading institutions, which possess relatively better technical structures, equipment, and human resources. These OPDs are capable of operationalizing digital mapping workflows, GIS-based geospatial analysis, and metadata compilation according to the Geospatial Information Agency (BIG) standards. However, the quality of implementation is inconsistent due to disparities in technical capacity across OPDs, particularly in the plantation, agriculture, and environmental sectors, which still rely on outdated, incomplete, or analog data.

This technical gap creates a situation referred to in geospatial governance literature as a "fragmented spatial data ecosystem," where the quality of thematic layers depends heavily on the capabilities of each OPD. Spatial maps, road networks, and hydrology maps produced by technical OPDs are relatively quickly incorporated into the integration system due to their uniform format, projection, and attribute structure. In contrast, the land use layer for the plantation sector, protected areas for the environment sector, and agricultural commodity data required repeated revisions because they did not meet geospatial interoperability standards. This phenomenon reinforces the argument that the implementation of One Map is not merely a technological issue, but rather a capacity asymmetry that impacts inter-regional government agencies (OPDs) cohesion within the data governance system. The One Map policy in Kampar Regency demonstrates that the transformation of spatial data governance is not merely a technocratic innovation, but an institutional process involving a bureaucratic paradigm shift from a sectoral model to a single data-based interoperable system. Legally, this policy rests on a strong regulatory framework through Presidential Regulation No. 39 of 2019 and Regent Regulation No. 47 of 2020. However, field findings indicate that this legal framework has not been fully institutionalized within the bureaucracy's operational capacity, resulting in the implementation gap phenomenon described by Sabatier and Mazmanian.

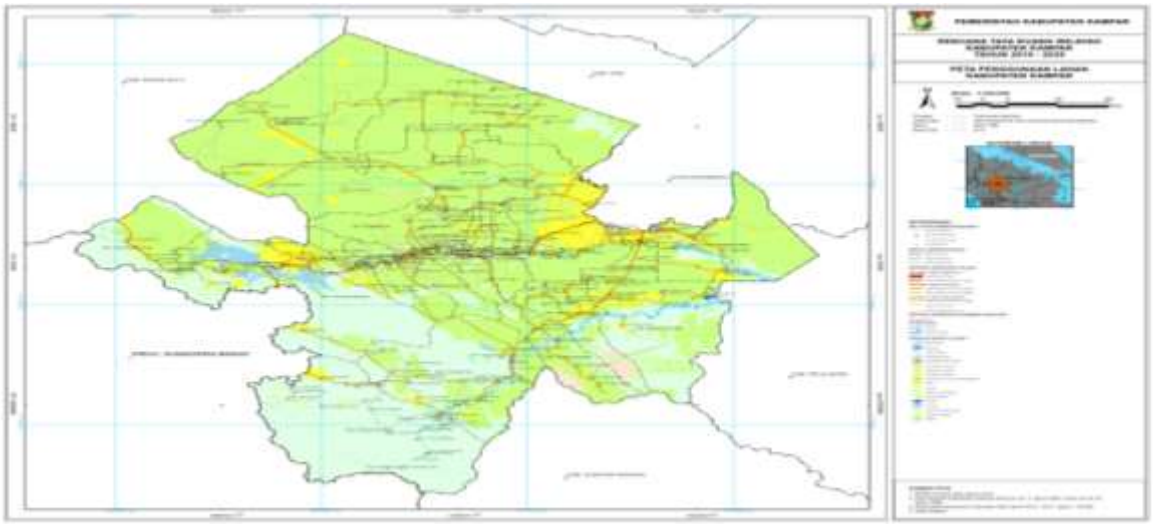

Figure 1: Land Use Map of Kampar Regency.
Data Source: Kampar Regency Spatial Plan 2019-2039.

Figure 1. Land Use Map of Kampar Regency, showing the diversity of spatial structures, including

settlements, cultivated areas, plantations, rice fields, and protected areas, which serve as a crucial basis for initial spatial data consolidation in policy. Procedurally, policy implementation begins with the inventory, harmonization, and verification of data across Regional Apparatus Organizations (OPDs), which previously worked in administrative silos and with different data formats. This stage is crucial because spatial datasets are heterogeneous in terms of format, geospatial accuracy, and technical metadata. After metadata standardization and validation by data guardians, all datasets are integrated into a spatial portal and a statistics portal managed through coordination between the Regional Development Planning Agency (Bappeda), the Geospatial Information Agency (BIG), and the Statistics Indonesia (BPS). The presence of this integrated data platform marks a milestone in structural change toward evidence-driven planning, replacing the sectoral interpretation-based work pattern.

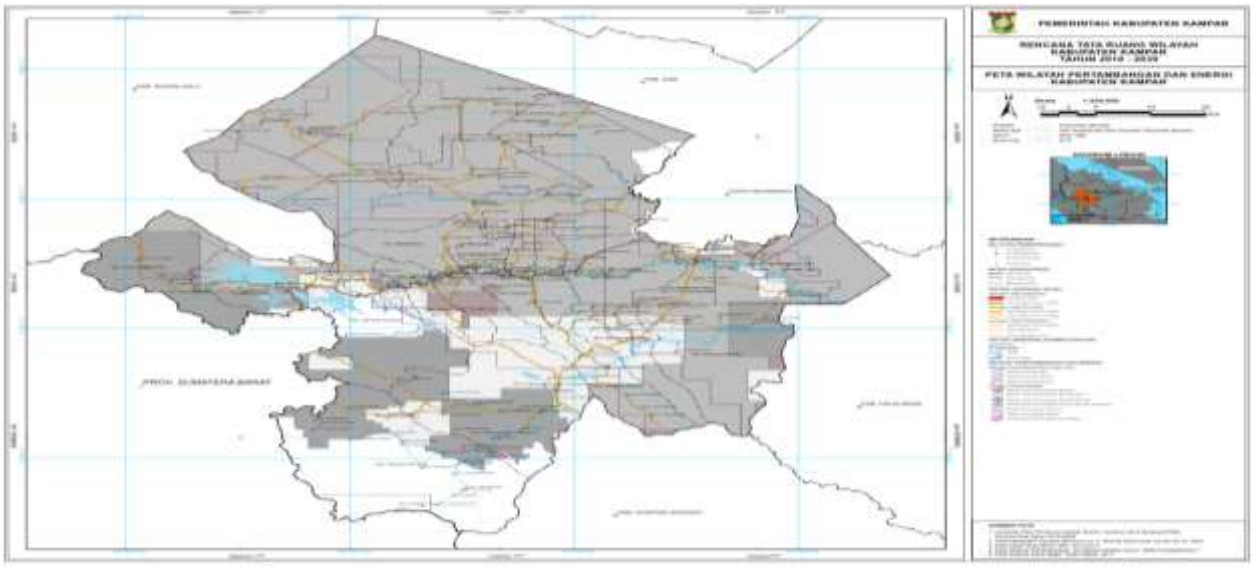

Figure 2: Map of Mining and Energy Areas in Kampar Regency.
Data Source: Kampar Regency Spatial Plan 2019-2039.

Figure 2. The spatial relationship between spatial planning functions is also illustrated in Figure 2. Map of Mining and Energy Areas in Kampar Regency, which shows the concentration of mining permits, the location of the Koto Panjang Hydroelectric Power Plant, and energy areas that technically require spatial synchronization with spatial plans as a permit control instrument. Field findings indicate that the One Data Forum and quarterly technical meetings serve as deliberative arenas, serving not only as data input mechanisms but also as a space for negotiation in cross-sectoral development planning. Thus, the implementation of One Map in Kampar is not merely the digitization of data assets but also marks an epistemic shift toward governance based on interoperability, collaboration, and transparency. However, significant obstacles remain in three key dimensions: technical capacity, organizational compliance, and governance consistency.

Capacity issues are also evident in organizational management, particularly the weak data updating culture in most regional government agencies (OPDs). The data updating process was unscheduled, unsupported by a long-term human resource development plan, and lacking a data quality audit mechanism. Few technical staff with GIS skills handled multiple tasks across programs, resulting in ad-hoc, rather than institutional, data updating. This pattern demonstrated a reliance on individual capacity rather than a standardized system. From a policy implementation perspective (Winter, 2012; Hill & Hupe, 2014), this situation suggests that regional institutional capacity serves as an articulation arena that determines how national policy designs are translated into operational practice.

Furthermore, capacity imbalances created uneven implementation speeds across regional government agencies (OPDs), preventing the spatial integration process from proceeding linearly. One Map in Kampar ultimately worked selectively, progressing quickly in areas with strong technical strength, but lagging behind in sectors with minimal capacity. Thus, implementation effectiveness was determined not by the existence of formal regulations or instructions, but rather by the distribution of

technical capacity and the organization's ability to uphold a data-driven work culture. This finding confirms that the success of One Map requires institutional balancing, namely efforts to equalize cross-OPD capacity to create a consistent, standardized, and sustainable spatial data ecosystem.

4.2. The Role of Middle Managers as Policy Translators in the Implementation of the One Map Policy in Land Governance in Kampar Regency

Field findings indicate that middle managers, including division heads, section heads, technical coordinators, and echelon IV structural officials, play the most strategic role in determining the direction of One Map Policy implementation in Kampar Regency. Contrary to the assumptions of traditional implementation models that position the middle bureaucracy as the implementers of instructions, empirical data demonstrates that middle managers act as policy translators, interpreting the central government's normative mandates into operational technical steps that can be implemented by regional work units. National instructions on map integration, geospatial standardization, and boundary harmonization are general and do not provide detailed implementation guidelines. Therefore, middle managers engage in sensemaking to determine priorities, design workflows, and build cross-regional coordination compatible with local capacity.

In practice, middle managers translate policy by prioritizing layers relevant to the Kampar context, particularly those related to actual land use, village-subdistrict administrative boundaries, RTRW overlays, and forest area layers, which are the most frequent sources of data discrepancies between units. This prioritization is not a procedural decision, but rather the result of calculating the urgency of issues in the field, such as village boundary disputes, misalignment of RTRW data with existing conditions, and development planning needs that require a single spatial basis. In other words, middle managers determine implementation entry points that substantively influence the direction of map harmonization, thus acting as actors formulating, not simply implementing, policy.

Equally important, middle managers also play a role as orchestrators of coordination between regional government agencies (OPDs). The implementation of One Map in Kampar involves the Ministry of Public Works and Housing (PUPR), the Regional Development Planning Agency (Bappeda), the Environment and Forestry Agency (DLHK), the Agriculture Department, the PMPTSP Office (PMPTSP), sub-districts, and villages, each with its own distinct traditions, technical standards, and sectoral authority. Formal coordination regulated through Regent's Decrees and technical forums does not automatically run effectively. Instead, middle managers determine the rhythm of coordination through informal communication, negotiations among technical staff, and interventions to harmonize differing data interpretations. In many cases, the cause of map differences between OPDs is not simply differences in field data, but differences in measurement methodologies, image resolution standards, and projection systems. Middle managers act as technical intermediaries capable of translating central standards into formats acceptable to all agencies, for example by creating internal technical guidelines related to standardizing shapefile formats, metadata, or geometric validation procedures. Field findings indicate that the quality of coordination is largely determined by the leadership of middle managers: in regional government agencies (OPDs) with proactive middle managers (e.g., the Ministry of Public Works and Public Housing and the Regional Development Planning Agency), data integration is rapid and conflicts are minimized; conversely, OPDs with passive middle managers create coordination bottlenecks that slow down the overall map harmonization process.

In addition to their coordinating function, middle managers also act as technical translation agents, enabling policy instructions to be executed. Central government instructions, such as harmonizing administrative boundaries and strengthening geospatial databases, are not always compatible with the technical capabilities of regional staff. This is where middle managers fill this gap by developing field verification procedures, data standardization protocols, and ongoing validation mechanisms. For example, in the process of harmonizing village boundaries in Kampar, middle managers initiated repeated field verification when overlaps were found between digitized village maps and the latest satellite imagery. They also established a clear division of roles between GIS staff, surveyors, and sub-district officials, ensuring a more structured harmonization process. These actions demonstrate that middle managers do not simply convey instructions from their superiors but convert them into technical workflows that can be consistently executed.

Furthermore, middle managers also play a crucial politico-administrative role by managing internal bureaucratic resistance. Resistance often arises from

regional government agencies (OPDs) who feel that map updates will disrupt sectoral authority, particularly agencies that have traditionally held exclusive domains for certain data, such as forest areas, village boundaries, or agricultural land. Some OPDs implicitly display a defensive stance, for example, delaying data submission, maintaining outdated map versions, or refusing to standardize image resolution. Middle managers play a mediating role by formulating technical compromises, such as agreeing on minimum standards before a full update or implementing phased integration. In some cases, they also acted as buffers, mitigating tensions between technical staff and OPD leaders by presenting arguments based on field evidence and regional development interests. Thus, their contributions were not only technical but also political, given that the implementation of One Map touches on cross-sectoral sensitivities related to authority, resources, and data legitimacy.

These findings overall indicate that middle managers were a key determinant of implementation speed in Kampar Regency. OPDs with middle managers with strong interpretative, coordinating, and technical capacities successfully accelerated map consolidation and increased inter-OPD cohesion. Conversely, OPDs with weak middle leadership became centers of implementation stagnation, resulting in delays in layer updates, data inconsistencies, and minimal coordination. Thus, the implementation of the One Map Policy in Kampar confirms that the success of spatial policy does not solely depend on the quality of national regulations or geospatial technology, but on the ability of middle managers to connect the policy vision with the realities of regional bureaucracy. This finding is in line with the literature (Wright & Pandey, 2010; Currie & Procter, 2005), but the Kampar context shows a new dimension that middle managers play a sensemaking–translation–mediation function that collectively shapes the policy implementation architecture at the local level.

4.3. Dynamics of Cross-Sector Coordination: Negotiation Arena and Technical Forum on the Implementation of the One Map Policy in Land Governance in Kampar Regency

The implementation of the One Map Policy in Kampar Regency shows a non-linear governance configuration, where the cross-sector coordination process presents political dynamics, institutional negotiations, and informal interactions that are far more complex than a technocratic policy design.

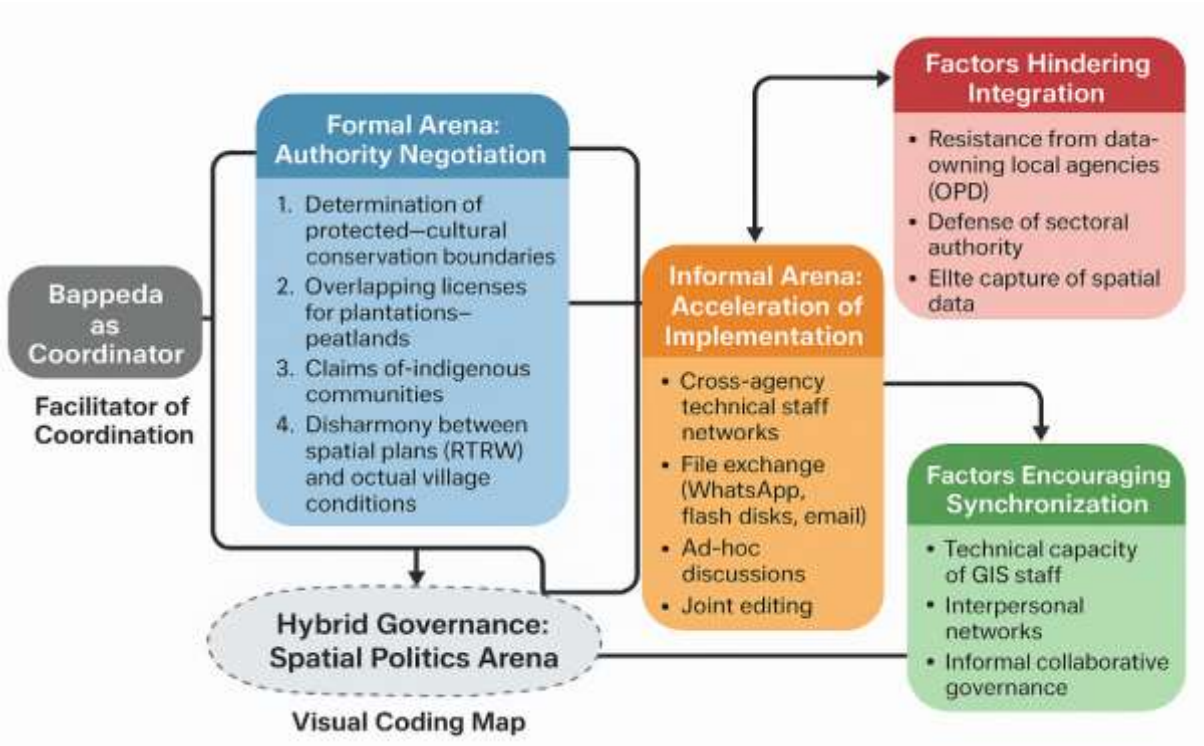

Figure 3. Dynamics of Cross-Sector Coordination in the implementation of the One Data policy in Kampar Regency.
Source: Data processed by the Author.

Figure 3. Normatively, One Map is designed to harmonize spatial data through a formal coordination mechanism led by Bappeda as the planning coordinator. However, field findings indicate that this coordination does not operate as a stable technical synchronization process, but rather develops into a spatial political arena, where various regional government agencies (OPDs) maintain, modify, or fight for spatial representations that align with their respective sectoral interests. Thus, the dynamics of policy implementation are more accurately understood as a hybrid governance process, where interactions between actors are simultaneously influenced by power, informal networks, and technical capacity.

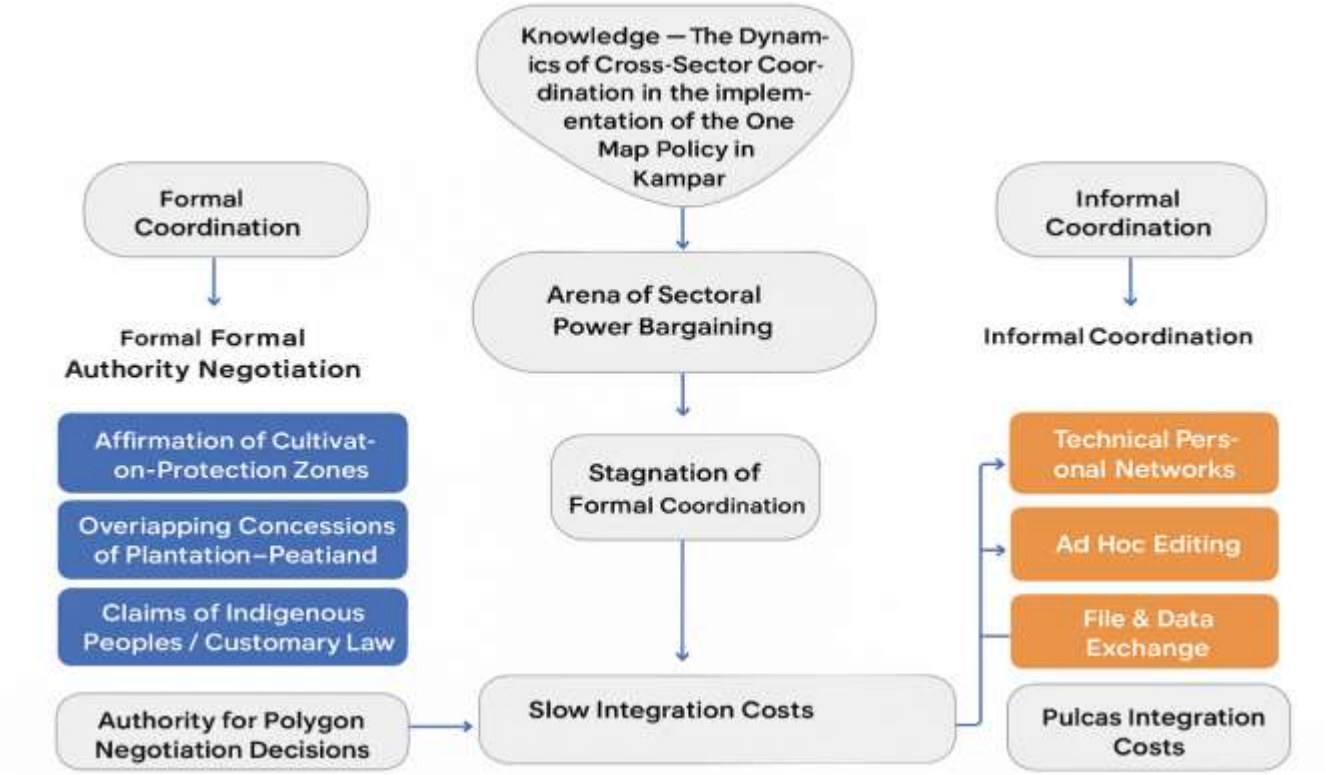

Figure 4. Flow, tensions, and cross-sector coordination mechanisms in the implementation of the One Map policy in Kampar Regency.
Source: Data processed by the Author.

Figure 4. Demonstrating that in the context of formal coordination, integration meetings and plenary verification forums often serve as platforms for sectoral power bargaining. Regional government agencies (OPDs) holding strategic data, such as the Plantation Service, the Environment Service, and the Agriculture Service, exhibit significant resistance to data revisions, fearing that changes to spatial layers will impact program legitimacy, sectoral authority, and resource allocation in the following fiscal year. This resistance is most evident on crucial issues such as protected area boundaries, cultivation, overlapping plantation concessions and peatland areas, and land use claims by indigenous communities that have not yet been formally addressed. Each issue generates technical arguments representing bureaucratic interests, so integration meetings become not merely a space for correcting spatial data but an arena for symbolic negotiations over who has the right to regulate space. This process often hinders the acceleration of integration because each polygon revision requires the approval of the OPD holding the data. The result is high transaction costs, in the form of lengthy coordination times, the need for repeated clarifications, and persistent inter-layer inconsistencies due to the lack of cross-sectoral agreement. The stagnation that occurred within this formal structure was interestingly offset by the dynamics of informal coordination initiated by technical staff. GIS technical staff from various Regional Apparatus Organizations (OPD) leveraged interpersonal networks to overcome the structural impasse. Through ad-hoc communication, personal exchange of shapefiles, and collaborative editing

outside of formal meeting agendas, they were able to significantly accelerate data synchronization. This collaboration was low-profile and not documented in minutes, but it produced tangible impacts in the form of attribute consistency between layers, correction of overlapping polygons, and technical understanding of metadata standards. These findings suggest that bureaucracy operates not only through structured formal mechanisms but also through informal practices that are adaptive, situational, and based on interpersonal trust. This phenomenon aligns with the literature on informal collaborative governance, which emphasizes that successful coordination often depends on interpersonal relationships and the ability of actors to develop adaptive solutions when formal mechanisms stagnate.

The interaction between formal and informal dynamics creates a dualistic pattern of implementation, where formal channels serve as a space for legalizing decisions, while informal channels serve as technocratic spaces for initial problem-solving before issues are brought to official forums. This dualism creates efficiency on the one hand but also creates structural vulnerabilities because successful implementation relies heavily on specific technical staff with strong networks. When staff turnover or leadership changes occur, informal collaborative capacity can weaken, creating risks to the sustainability of implementation. Thus, the One Map initiative in Kampar demonstrates that the weak institutionalization of formal procedures encourages the bureaucracy to rely on informal mechanisms as compensation, but excessive reliance on personal relationships can undermine long-term governance stability.

The dynamics of cross-sectoral coordination in Kampar also demonstrate asymmetries in information and technical capacity among regional government agencies (OPDs). OPDs with strong geospatial competencies appear more dominant in meetings, able to mobilize technical arguments to defend or reject data changes. Meanwhile, OPDs with weak spatial capacity tend to follow the dominant argument or rely on the interpretations of others. This capacity imbalance leads to elite capture in the map integration process, where technical decisions that should be objective can be influenced by the interests of regional government agencies (OPDs) with stronger technical capabilities and political positions. This phenomenon reinforces the conclusion that One Map integration relies not only on regulations or technology, but also on the internal power structures of local governments.

Furthermore, the dynamics of spatial negotiations in the implementation of One Map in Kampar reveal that maps function not simply as representations of physical space but also as "political instruments" that legitimize actors, form the basis for budget distribution, and determine the scope of program interventions. Therefore, maps become objects of contestation that transcend technical issues, allowing any changes to the polygons to trigger sectoral resistance. These findings reinforce arguments in critical GIS literature, which view maps as political products reflecting power structures, not neutral objects. Thus, the implementation of One Map in Kampar demonstrates how a technocratic policy can become a platform for the reproduction of power through spatial negotiation. At the same time, One Map also opens up new discussion spaces regarding indigenous peoples' claims, particularly in areas with a history of customary-based land tenure. Although customary data has not been formally integrated, the existence of indigenous peoples' claims maps creates pressure points in coordination forums. However, because customary claims are often not supported by formal legality, this issue is often postponed and not prioritized during initial integration. This phenomenon demonstrates the policy's limitations in accommodating the voices of non-state groups and confirms that cross-sectoral coordination is dominated by bureaucratic and formal sector actors, while community actors are marginalized. This underscores the need for more inclusive policy design so that One Map becomes not only a government instrument but also a mechanism for equitable representation for all spatial actors.

Overall, the implementation of the One Map Policy in Kampar Regency reflects a governance process influenced by the interplay of sectoral interests, technical capacity, formal negotiation arenas, and informal networks that work to compensate for formal weaknesses. This process demonstrates that the success of spatial policy implementation is largely determined by the strength of cross-sectoral coordination, the quality of relationships between actors, and the ability of institutions to manage conflicts of authority and data asymmetry. In other words, One Map cannot be reduced to a technology-based technocratic policy but must be seen as a dynamic political-spatial arena, where spatial representation becomes an object of contestation and collaboration between institutions. In this context, Kampar Regency presents an empirical illustration of how spatial policy at the regional level is implemented within a hybrid governance framework, where ultimate success is determined more by bureaucratic adaptation and

informal network cohesion than by the perfection of policy design.

4.4. Technical and Digitalization Challenges: Dual Mapping and Metadata Consistency in the Implementation of the One Map Policy in Land Governance in Kampar Regency

Field findings indicate that the implementation of the One Map Policy in Kampar Regency faces not only technical challenges in spatial digitization, but also far more fundamental epistemic and institutional issues. One of the most obvious manifestations is the emergence of dual mapping, where several Regional Apparatus Organizations (OPDs) maintain different versions of maps for the same location.

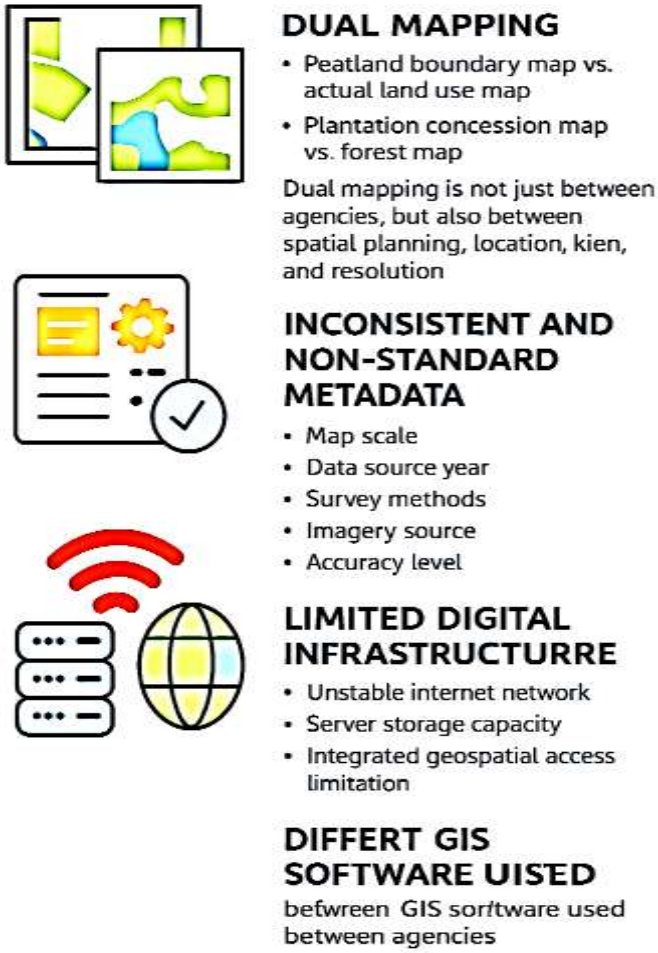

Figure 5. Dual Mapping and Consistency of Digital Infrastructure Metadata.
Source: Data Processed by the Author.

Figure 5 demonstrates that this dual mapping is not simply a cartographic error, but a symptom of a failed coordination system and low institutional coherence in regional geospatial governance. For example, the discrepancy between peatland boundary maps and actual land use maps creates a lack of synchronization in ecological references, thus hampering consistent peatland ecosystem protection planning. Similarly, the overlap between plantation concession maps and forestry maps demonstrates policy fragmentation, reflecting the dominance of sectoralism in data preparation and updating. The discrepancy between the RTRW document and the latest satellite imagery even suggests that the quality of spatial planning relies heavily on outdated historical data, hampering evidence-based decision-making. In the context of data governance theory, dual mapping indicates the absence of a single authoritative data source, which slows down the synchronization process because each regional government agency (OPD) feels it has a legitimate claim to its own version of the data. Consequently, the map integration process requires time-consuming re-verification, prolonging bureaucracy, and creating potentially political negotiation between actors.

On the other hand, inconsistent metadata issues demonstrate that the technical standards established by the Geospatial Information Agency (BIG) have not been fully institutionalized at the regional level. Much spatial data lacks basic information such as map scale, data source year, survey method, image source, and accuracy level. In data governance literature, incomplete metadata is a form of low data stewardship, where institutions fail to prioritize data integrity. The implications are substantial: verifying map quality becomes difficult, lineage tracking processes are hampered, and multi-source integration becomes problematic due to the lack of a reference point for assessing the reliability of each dataset. This lack of metadata standardization ultimately undermines the credibility of integrated maps produced by local governments, thus undermining the primary objective of the One Map Policy: providing a single, accurate and accountable geospatial database. From a spatial data infrastructure (SDI) perspective, this situation demonstrates that Kampar Regency has not fully succeeded in establishing the "data standardization" component that underpins spatial interoperability.

In addition to data and metadata issues, the implementation of the One Map Policy in Kampar is also hampered by inadequate digital infrastructure. Several regional government agencies (OPDs) still face unstable internet connections, limited server storage capacity, and differences in GIS software used across sectors. These conditions indicate that despite national policies promoting digital spatial integration, digital readiness at the local level remains asymmetrical. Furthermore, limited access to integrated geoportals prevents real-time data sharing, resulting in frequent delays in data updates. From the perspective of technical readiness and digital divide theories in local government, these issues reflect local conditions in a transitional stage: aware of the need for digital integration but lacking the infrastructure to support optimal policy implementation. The fragmentation of GIS software across OPDs exacerbates the situation by creating barriers to data conversion, differing projection systems, and inconsistent formats, preventing the synchronization process from achieving the seamless integration mandated by the One Map Policy.

Overall, the combination of dual mapping, incomplete metadata, and limited digital infrastructure demonstrates that the implementation of the One Map Policy in Kampar Regency still faces significant structural and institutional challenges. These issues cannot be resolved simply by improving the technical aspects of mapping, but require more systemic spatial data governance reforms, starting from the establishment of stronger cross-OPD coordination mechanisms, consistent enforcement of metadata standards, increasing the digital capacity of the apparatus, and harmonizing the GIS software used. Thus, the implementation of the One Map Policy in Kampar demonstrates that the success of geospatial policies is determined not only by technology, but also by the ability of institutions to build epistemic uniformity, organizational coordination, and a shared commitment to a single source of spatial truth.

4.5. Transformation of Bureaucratic Behavior: The Emergence of New Awareness of the Importance of Spatial Data for the Implementation of the One Map Policy in Land Governance in Kampar Regency

Field findings in Kampar Regency indicate that the implementation of the One Map policy not only serves as a technocratic intervention to harmonize spatial information but also serves as a catalyst for changes in bureaucratic behavior, leading to the strengthening of evidence-based governance. This transformation can be interpreted as an administrative learning process, where the bureaucracy begins to internalize new values related to data standardization, cross-sector integration, and information accuracy as prerequisites for policymaking.

First, the increasing demand for map updates from other regional government agencies (OPDs) highlights a shift in inter-agency dependency patterns. In the initial phase, each OPD worked with different spatial databases, resulting in frequent information conflicts, such as differences in the delineation of cultivated and protected areas or inconsistencies in village boundaries. However, after the One Map intervention, OPDs demonstrated demand-driven adaptation, where requests for map updates indicated that the integrated map had become a common reference framework for planning. This reflects a shift from bureaucratic autonomy to interdependent coordination.

Second, the emergence of a practice of field verification prior to map finalization indicates that the implementation of this policy has increased internal bureaucratic accountability. This change is not simple, as field verification was previously perceived as an additional, time-consuming process. However, ground-truthing practices are now internalized as a data quality standard, especially after regional government agencies (OPDs) experienced the administrative consequences of

boundary errors, for example in determining development locations or handling land-use conflicts. Thus, One Map has resulted in changes in routines and norms, which are at the heart of institutional transformation according to new institutionalism theory.

Third, the decline in the use of non-official spatial data in planning reflects a process of policy discipline. In many early cases, OPDs relied on outdated maps or unofficial sources such as private project maps or individual survey maps. Following the standardization and interoperability of data within the One Map framework, the use of informal data began to be deemed administratively illegitimate. This shift is consistent with the notion of policy-induced compliance, where new policies provide normative and procedural incentives that encourage the bureaucracy to adhere to a single standard.

Fourth, the use of GIS as an analytical tool in development planning demonstrates an increase in both the technical capacity and analytical orientation of the bureaucracy. In Kampar, GIS was initially treated solely as a visualization tool. However, field findings indicate that OPDs are now beginning to utilize GIS for scenario planning, overlay analysis of land potential, identification of disaster-prone areas, and infrastructure planning. This marks a transition from map-based planning to analytical spatial governance, which is theoretically a prerequisite for improving the quality of public policy in the digital era.

Overall, this transformation demonstrates that the One Map policy does not stop at producing integrated maps. A more substantive impact emerges through changes in bureaucratic work culture, namely a shift from fragmented administrative work patterns to a more collaborative, transparent, and evidence-based governance model. This process confirms that policy implementation is influenced not only by formal structures but also by the dynamics of bureaucratic actors' behavioral adaptations within the local context. The Kampar case demonstrates that when spatial policy is given space to reshape routines and coordination between regional government agencies (OPDs), it can generate governance value greater than simply map harmonization, namely building institutional trust and epistemic alignment in land management.

4.6. Improvement of Land Use Governance: Impact on Legal Certainty of the Implementation of the One Map Policy in Land Governance in Kampar Regency

The implementation of the One Map Policy in Kampar Regency demonstrates that spatial data integration functions not only as a technocratic instrument but also as a corrective mechanism that influences the legitimacy and legal certainty of spatial use. Field findings indicate that data harmonization between agencies through the synchronization of scales, mapping methods, and metadata has been able to correct a number of historical discrepancies that previously served as a source of policy conflict.

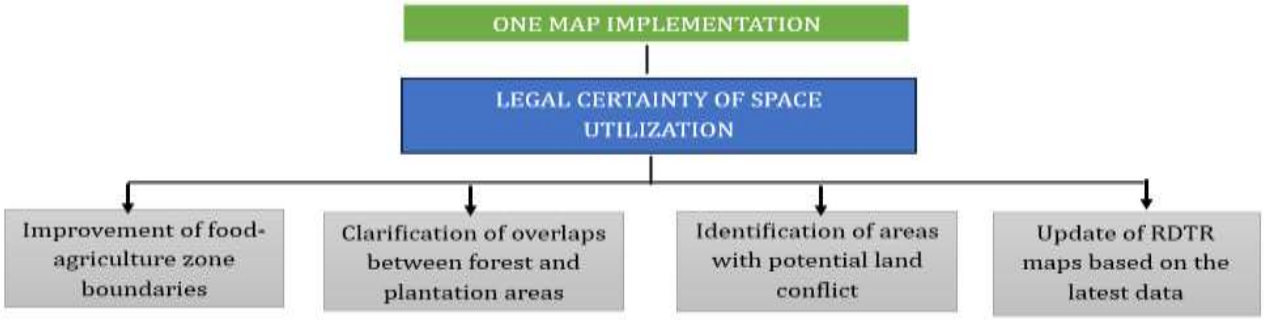

Figure 6. Impact of the One Map Policy Implementation on Legal Certainty of Spatial Use in Kampar Regency

Source: data processed by the Author

Figure 6. In the Kampar context, these corrections are most evident in four strategic clusters. First, the revised boundaries of food crop areas demonstrate that One Map serves as legal evidence, revising old delineations created without the support of up-to-date geospatial surveys. Field validation conducted by the Department of Agriculture and the Regional Development Planning Agency (Bappeda) revealed that several food crop land blocks were previously incorrectly recorded as plantation areas, reducing the effective area of food crop land in the RTRW (Regional Spatial Plan) document. Through data integration, these boundaries were corrected, providing a stronger legal basis for designating

Sustainable Food Crop Land (LP2B). Thus, One Map reduces policy drift in the food sector that has resulted from inconsistent sectoral maps. Second, the clarification of overlapping forest and plantation areas demonstrates One Map's function as a legal reconciliation instrument (jurisdictional reconciliation). Field data shows that several private and community plantations permits overlap with production forest and protected forest areas. Prior to the implementation of One Map, each agency—the Environmental Agency, the Plantation Agency, and the Forest Management Unit—used different versions of maps, leading to conflicting legal interpretations. Through the integration of a single map, these overlaps can be precisely identified and serve as the basis for developing recommendations for permit corrections, adjusting area function blocks, and reaffirming disputed forest area boundaries. This process strengthens the legal enforceability of forest area status. Third, the identification of areas with potential land conflicts demonstrates that One Map provides a spatially based early warning system. In Kampar Regency, several locations previously undocumented as conflict-prone areas showed overlapping community claims, company permits, and state land status. The use of a single database allows for more objective remapping of disputed areas, providing the Regency Government with a legal and technical basis for mediation intervention. This is crucial because many land conflicts have escalated due to the absence of mutually agreed-upon spatial references. Thus, One Map serves as a risk governance tool in managing agrarian conflicts. Fourth, the latest data-based RDTR map update demonstrates that One Map is a policy enabler for spatial planning. The integration of new layers from the Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN), the Ministry of Environment and Forestry (KLHK), and local geospatial survey results strengthens the accuracy of the Regional Development Planning (RDTR), ensuring regulatory accountability (especially in the issuance of Spatial Utilization Activity Conformity (KKPR). Field data confirms that the previous RDTR relied heavily on outdated administrative boundaries, which were out of sync with actual spatial patterns, leaving room for wide interpretation in permit issuance. With the One Map-based update, the RDTR becomes more precise, adaptive, and legally legitimate.

Overall, although One Map has not fully resolved various structural problems in land governance, such as inter-agency friction, power struggles, or limited GIS operator capacity, field findings indicate that this policy has narrowed the gap in spatial data between agencies. Consistent data across sectors creates a stronger legal basis for local governments to make strategic decisions related to spatial planning, permit issuance, and agrarian conflict mitigation. In other words, One Map enhances legal certainty and administrative coherence, which have been weaknesses in land governance in Kampar.

5. CONCLUSION

The implementation of the One Map Policy in Kampar Regency demonstrates that spatial data integration is not primarily determined by technical tools, but by institutional capacity, the quality of policy translation by middle managers, and the configuration of cross-sectoral coordination. Inequality of capacity between regional government agencies (OPD) results in data fragmentation and low interoperability, resulting in uneven institutionalization of national geospatial standards. In this context, middle managers play a key role, mediating central instructions, setting layer priorities, managing sectoral resistance, and maintaining the continuity of the integration process through both formal and informal mechanisms. Cross-OPD coordination occurs in a hybrid pattern, where formal forums are influenced by authority negotiations, while informal networks of technicians accelerate data synchronization, while simultaneously creating personnel dependencies. Technical challenges such as dual mapping, inconsistent metadata, and limited digital infrastructure indicate that the basic elements of the Spatial Data Infrastructure are not yet fully developed. Overall, the implementation of One Map in Kampar is a spatial governance process that navigates between technocratic demands and political-institutional dynamics. Its effectiveness is determined by the region's ability to establish consistent standards, balance capacity across regional government agencies (OPDs), stable collaborative networks, and competent middle leadership. Without strengthening these factors, spatial data integration will struggle to serve as a basis for accurate, authoritative, and sustainable spatial governance.

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REFERENCES

Ansell, Chris, and Alison Gash. 2008. "Collaborative Governance in Theory and Practice." *Journal of Public Administration Research and Theory* 18(4): 543–71.

Creswell, John W, and J David Creswell. 2017. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage publications.

Dinas Kominfo dan Persandian Kampar. 2021. "Pimpin Rapat Teknis Satu Data, Bupati Kampar Minta Sajikan Data Yang Akurat."

Dolata, Mateusz ; Schenk, Birgit ; Fuhrer, Jara ; Marti, Alina ; Schwabe, Gerhard. 2020. "When the System Does Not Fit : Coping Strategies of Employment Consultants." 29: 657–96.

Dwiki Ridhwan, Muis Fajar, Adi Pradana, Rakhmat Hidayat dan Rolly Leatemia. 2019. "3 Contoh Kasus Konflik Lahan Dan Bagaimana Kebijakan Satu Peta Dapat Memperbaikinya."

Holt, Alison, and Joe Morris. 2022. "Will Environmental Land Management Fill the Income Gap on Upland-Hill Farms in England?" *Land Use Policy* 122(August): 106339. https://doi.org/10.1016/j.landusepol.2022.106339.

Indonesia, Pusat Dokumentasi dan Informasi Ilmiah Lembaga Ilmu Pengetahuan. 2018. "Penggunaan Dan Pengembangan Produk Informasi Geospasial Mendukung Daya Saing Nasional."

Iswahyudi, Fajar et al. 2020. "Kontekstualisasi Adopsi Kebijakan : Studi Kasus Kebijakan Pengendalian Covid-19 Di Korea Selatan Contextualization in Policy Adoption : Case Study of Covid-19 Control Policy in South Korea." 16(2): 117–36.

———. 2020. "Montekstualiasi Multi Arus : Studi Kasus Kegagalan Pembuatan Kebijakan Karantina Wilayah di DKI Jakarta." *Kontekstualisasi Teori* 16(1): 1–18.

Kemenko. 2021. "Kebijakan Satu Peta Memberikan Manfaat Luas Bagi Pembangunan Indonesia."

Koto, Eryus Amran, and Sari Ningsih. 2024. "Kebijakan Satu Peta Dan Satu Data Dalam Program Percepatan Pengadaan Informasi Geospasial Dasar Dan Informasi Geospasial Tematik (Kerja Sama Badan Informasi Geospasial Dengan Badan Usaha Milik Negara)." 2: 42–53.

Kraft, E, and R Furlong. 2022. *Public Policy*.

Kurniawan, Risky, and Teguh Kurniawan. 2023. "Comparison of Geospatial Data Management between Indonesia ' s One Data and One Map Policy." 10(1): 39–50.

Loffreda, Giulia et al. 2024. "Barriers and Opportunities for WHO ' Best Buys ' Non-Communicable Disease Policy Adoption and Implementation From a Political Economy Perspective : A Complexity Systematic Review." *Kerman University of Medical Sciences* 13: 7989. https://doi.org/10.34172/ijhpm.2023.7989.

Paul A. Sabatier. 2006. *Theories of the Policy Process*. California.

Pelengkahu, Muhammad Rahjay. 2022. "One Map Policy: Digital Administration Methods as an Effort to Solve Land Overlaps in Indonesia." 5: 1–8.

Public, J E, Boston Houghton, and Mifflin Company. 2003. "Anderson, J. E. (2003)."

Rahman, Abdul. 2018. "Identifikasi Strategi Peningkatan Kesejahteraan Masyarakat Di Kecamatan Sungaiambawang Kabupaten Kuburaya Provinsi Kalimanyan Barat." *Jurnal Manajemen Pembangunan* 5(1): 17–36.

Ramadani, Thoriq et al. 2019. "Matra Pembaruan." : 109–18.

Science, Forest, and Ahmad Maryudi. 2019. "Jurnal Ilmu Kehutanan." : 2015–17.

Silviana, Ana. 2019. "Kebijakan Satu Peta (One Map Policy) Mencegah Konflik Di Bidang Administrasi Pertanahan." 2(2): 195–205.

Sumarsyah, Wilda. 2025. "Post-Disaster Rehabilitation And Reconstruction Policy Study : Between Public Interest And Project Politics." 2(4): 24–34.

Suzuki, Kohei; Hur, Hyunkang. 2024. "Politicization , Bureaucratic Closedness in Personnel Policy , and Turnover Intention."

Ulfah Dwi Rahmawati. 2022. "Urgensi Kebijakan Satu Peta Untuk Menyelesaikan Tumpang Tindih Penggunaan Lahan." : 42–59.

Virgy, Muhammad Arief, Mustabsyirotul Ummah, and Ahmad Mikail. 2024. "Integritas : Jurnal Antikorupsi One Map Policy as an Anti-Corruption Endeavour in the Indonesian Mining Sector." 10(2): 161–72.

Wahyuningsih, Sri. 2024. "Implementasi Kebijakan Satu Peta Dalam Rangka Penyelesaian Tumpang Tindih Pemanfaatan Ruang Kabupaten Kotawaringin Timur." 12(September): 290–309.

Widartono, Barandi Sapta et al. 2023. "Penerapan Data Spasial Kebijakan Satu Peta Untuk Pemodelan Kerawanan Malaria Terintegrasi , Kasus Malaria Perbukitan Menoreh." 37(1): 22–29.

William N. Dunn. 2011. *Public Policy Analysis*.