

MAPPING CUSTOMARY SPATIAL STRUCTURE FOR SPATIAL PLANNING INTEGRATION IN THE MERATUS GEOPARK

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ABSTRACT

Geopark management increasingly requires approaches that connect landscape conservation with the spatial systems embedded in local communities. In the Meratus Geopark, this issue is particularly important because several customary territories have recently obtained formal legal recognition, while their spatial structures remain only weakly translated into formal spatial planning frameworks. This study aims to identify and map the customary spatial structure of four formally recognized customary law communities in Loksado District and to assess its relevance as an initial basis for spatial integration in the Meratus Geopark. The research adopts a qualitative comparative case study design, grounded in document analysis and spatial interpretation. Data were drawn from four decrees of the Regent of Hulu Sungai Selatan and their appendices, which contain profiles of customary territories, customary spatial categories, land tenure and access arrangements, customary institutions, and customary maps. The analysis combined structured data extraction, qualitative content analysis, cross-case comparison, and the translation of customary spatial categories into planning-relevant spatial functions. The results show that the four customary territories contain internally differentiated spatial categories that consistently correspond to protective, productive, transitional, settlement, and sacred functions, and in some cases to water-related functions. The study contributes an analytical bridge between the formal recognition of customary territories and more context-sensitive spatial integration in the Meratus Geopark.

Keywords: Indigenous Territoriality; Customary Land Tenure; Local Spatial Knowledge; Geopark Governance; Planning Translation; Loksado

INTRODUCTION

Geoparks are increasingly understood not only as areas that highlight geological heritage, but as territorial spaces that connect protection, education, sustainable development, and local community involvement (El Hamidy et al., 2025; van Onselen et al., 2025). UNESCO affirms that UNESCO Global Geoparks are managed through a holistic approach that links geological heritage with natural heritage, culture, and local knowledge, and is built through a bottom-up process involving local stakeholders (Fassoulas et al., 2022; Mammadova et al., 2022; Simbaña-Tasiguan et al., 2024). In this framework, geoparks are not just conservation instruments, but also an arena of regional management that demands connectivity between landscapes, local identities, and spatial governance (Zhuang et al., 2024). This position is becoming increasingly relevant in Meratus, which has now been listed as a UNESCO Global Geopark and officially

presented by UNESCO as an area that connects the geological diversity, Banjar and Dayak culture, and livelihoods of local communities (Ristiawan et al., 2023, 2024).

In the field of regional planning, the consequences of such a perspective are quite clear: the success of geoparks is determined not only by the quality of the geosite or the promotion of geotourism, but also by the ability of its management system to read the socio-spatial structures that have lived within the region (Ferdowsi & Németh, 2026). UNESCO explicitly states that UNESCO Global Geoparks must have a management body and a management plan that respond to the socio-economic needs of local populations, protect landscapes, and maintain cultural identity (Koupatsiaris & Drinia, 2023). Studies on geopark management also show that geoparks are a form of territorial management that demands a clear management structure, as they must integrate the

functions of protection, education, regional development, and multi-stakeholder cooperation (Ferdowsi & Németh, 2026; Kornecká et al., 2024). Thus, geoparks are essentially a matter of spatial governance, not just branding geological heritage (Zhuang et al., 2024). An inclusive, collaborative management approach with local stakeholders is essential to achieving conservation and sustainable development goals in geoparks (Ferdowsi & Németh, 2026). In addition, integrating landscape protection with local communities' socio-economic needs is key to the success of holistic geopark management (El Hamidy et al., 2025; Malatyinszki et al., 2025).

Problems in regional planning practices often arise because the living spaces of local communities, especially indigenous communities, have not been adequately translated into formal spatial planning languages (Milanese & Sibilla, 2025). Although customary territories have obtained legal recognition, this recognition has not automatically resulted in operational spatial recognition in spatial structures, zoning, or spatial utilisation directions (Perez, 2022). In Meratus, this is important because cultural and local community elements are part of the main value of geoparks, so if customary territories are only considered as legal categories or cultural symbols without a clear spatial governance function, the integration of geoparks with risky regional planning is partial (Dawson et al., 2021; Milanese & Sibilla, 2025). The need to link the recognition of indigenous territories with spatial readings is increasingly urgent so that spatial governance can reflect the functions, access rules, and management mechanisms that live in communities (Perez, 2022; Rivers et al., 2023). Participatory and collaborative approaches that combine local knowledge and modern technology can help bridge the gap between formal systems and the socio-spatial realities of

indigenous peoples (Del Carmen Aliaga Fuentes et al., 2025; Rivers et al., 2023). Thus, integrating indigenous epistemology into formal spatial planning is essential to ensure socio-ecological sustainability and territorial justice in areas such as Meratus (Dawson et al., 2021; Milanese & Sibilla, 2025).

The relevant literature provides two complementary analytical foundations for understanding customary territories within the framework of territorial planning. First, the study of indigenous planning and territorial planning emphasises that indigenous knowledge is not only a reservoir of cultural values, but also a cognitive and practical tool for organising space and managing territories, provided that it is carefully integrated through a methodological framework that can bridge indigenous and Western perspectives (Milanese & Sibilla, 2025). In this context, the main question is not whether indigenous knowledge is relevant for planning, but how to build collaborative governance, institutional capacity, and participatory procedures that can address governance fragmentation and epistemological gaps that have limited its integration (Milanese & Sibilla, 2025; Perez, 2022). Second, the literature on customary tenure shows that land tenure in indigenous communities is pluralistic and relational, as it combines communal ownership, family rights, and negotiated access, so that the reading of customary space demands equal attention to the spatial dimension, access rules, and governance structures that support it (Burke, 2025; Kabra et al., 2023; Pereira, 2023). Evidence from hybrid models linking customary law with modern administration suggests that recognition of local institutions can strengthen territorial cohesion and community participation (Aragão et al., 2025), while conservation studies affirm that effective and equitable management depends on tangible recognition of the role of indigenous peoples in

decision-making as well as the legitimacy of their tenure institutions (Dawson et al., 2021; Fernández-Llamazares et al., 2021). Therefore, customary territories are more appropriately understood as complex territorial systems, in which space, access, and governance operate simultaneously and must be read in an integrated manner for sustainable planning (Milanese & Sibilla, 2025).

However, the synthesis of the existing literature still shows significant conceptual gaps. Although many studies have affirmed the importance of recognising indigenous peoples' rights and the relevance of indigenous knowledge in planning, relatively few explicitly operationalise local spatial categories in indigenous territories into spatial functions that can be read and integrated into formal spatial systems. This gap becomes sharper in the context of geoparks, where UNESCO has consistently emphasised the need to incorporate local-indigenous management knowledge and systems into regional planning and management, while analytical frameworks linking customary spatial structures to the need for spatial integration of geoparks are still underdeveloped (Hill et al., 2021; Iralu, 2021). Some studies have offered participatory approaches and the support of technologies such as GIS to visualise indigenous knowledge in spatial planning, but the orientation still tends to rest on resource management or risk mitigation, rather than on reading customary space categories as analytical units of spatial planning (Li et al., 2025; Nkosi et al., 2022). Meanwhile, a more holistic approach, which views the relationships among communities, ecosystems, and landscapes as dynamic processes, indicates that overly rigid formal spatial demarcation models have not adequately explained the territorial complexity of indigenous peoples (Zavoleas et al., 2023). In this context, co-production and collaboration between local

actors and formal institutions are important, not only to strengthen adaptive governance but also to affirm the institutional position of indigenous peoples in regional planning (Hill et al., 2021; Rivers et al., 2023). Therefore, the most urgent issue is no longer just an affirmation of the importance of indigenous peoples in geopark management, but the development of a framework that can translate the structure of customary space that has been recognised into spatial analytical units in a more operational, contextual, and sustainable manner (Barianaki et al., 2024; Hill et al., 2021).

This gap is important to research because, without an adequate translation framework, the relationship between customary territories and geopark spatial planning will remain at the level of normative recognition. In Loksado District, the urgency is supported by four customary law communities that have been officially recognised: Karukunan Balai Adat Datu Kandangan (Regent of South Hulu Sungai, 2025d), Karukunan Balai Adat Datung Makar (Regent of South Hulu Sungai, 2025c), Karukunan Balai Adat Datung Makar (Regent of Hulu Sungai Selatan, 2025b), and Balai Bayumbung (Regent of Hulu Sungai Selatan, 2025a), each of which has a description of customary territory, spatial categories, land tenure, and customary institutions. These four cases provide a strong empirical basis for showing that local terms such as wood, katuan, pahuaman, jurungan, kabun, kampung, sacred areas, and rivers are not merely cultural terms but also function as spatial classifications in the Meratus landscape. Therefore, this study does not depart from the effort to standardise customary spaces into the language of planning, but rather from the need to understand their local structure and meaning first, so that dialogue with formal spatial planning can take place more operationally and contextually. In this regard, the use of spatial technologies and participatory approaches is

becoming increasingly relevant for strengthening the visualisation and integration of indigenous knowledge into formal spatial planning (Liu & Biljecki, 2022; Ul Din & Mak, 2021).

Based on this background, this study aims to identify and map the structure of customary space in four recognised customary law communities in Loksado, compare the categories of space, land tenure, and customary institutions among the four cases, and assess how these structures can be used as the initial basis for spatial integration in the Meratus Geopark area. The main question is: how can the structure of customary spaces in the four customary law communities in Loksado be mapped and translated into an analytical basis for the spatial integration of geopark areas? The main contribution of this research lies in the effort to move the discussion of customary territories from the realm of normative recognition to a more operational spatial reading. More specifically, the novelty of this study lies in the construction of an analytical bridge between the officially documented categories of customary spaces and the functions of spaces relevant to planning, so that customary territories are treated not only as legal or cultural entities, but as spatial units that can be read within the framework of geopark governance and regional spatial planning.

RESEARCH METHODS

Research Design

This study uses a qualitative comparative case study design based on document analysis with the support of spatial interpretation because the design is best suited to understand how the structure of customary space in the four recognised customary law communities can be identified, compared, and translated into spatial functions relevant to the spatial planning of the Meratus Geopark area. With this orientation, this study is not intended to examine the cause-and-effect relationship or

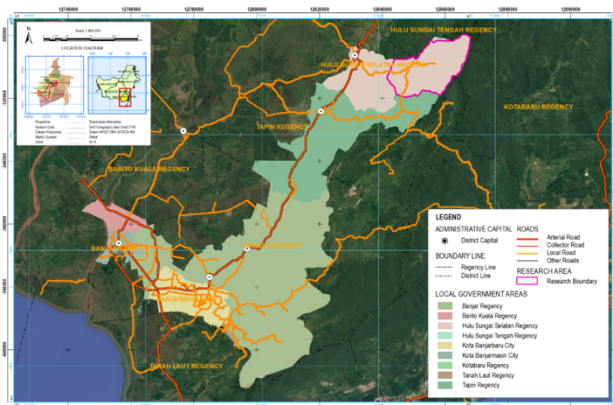
to measure the influence between variables, but to build an analytical reading of the formally documented local spatial categories, land tenure rules, and customary institutions. This choice is also in line with studies that emphasise that the integration of community-based land management systems into formal planning frameworks requires careful reading of the informal spatial logic at work at the local level, especially when spaces are managed through norms, classifications, and practices that are not fully captured by technocratic instruments (Geyer, 2025).

Therefore, the comparative approach not only allows researchers to go beyond a single case description but also to identify common patterns across regions, such as the existence of shelters, cultivation spaces, transition spaces, settlement spaces, and sacred spaces, without eliminating the peculiarities of the terms as well as the spatial structure of each community. In this context, the introduction of the classification of local spaces is a fundamental methodological step before these spaces can be meaningfully dialogued with formal spatial systems, as also emphasised by studies that show the importance of understanding community-based space categories as a prerequisite for substantive planning integration, not just administrative (Fuseini, 2021; Sirajuddin et al., 2022). Thus, the design of this study provides an adequate foundation to read customary territories as a living spatial system while constructing an analytical bridge between the concept of customary space and the need for spatial integration in the context of geoparks.

Location and Context of the Study

This study was conducted in Loksado District, Hulu Sungai Selatan Regency, South Kalimantan Province, which lies within the Meratus Geopark delineation. The geopark delineation used in this study was obtained from the Meratus Geopark Management

Agency and overlaid with administrative boundary data from the Geospatial Information Agency (BIG) downloaded via Ina-Geoportal. Area calculations were performed using the Cylindrical Equal Area projection to ensure consistent area measurement in line with spatial planning practice in Indonesia. Loksado was selected because it represents an important part of the Meratus upland landscape where indigenous livelihoods, customary territorial systems, and spatial governance intersect. By 2025, the local government had formally recognized four customary law communities in this area, providing official documents that enable systematic spatial analysis. The four customary territories examined are *Karukunan Balai Adat Datu Kandangan* (2,712.31 ha), *Karukunan Balai Adat Keturunan Datu Mayawin-Urui* (1,603.36 ha), *Karukunan Balai Adat Datung Makar* (4,386.72 ha), and *Balai Bayumbung* (769.20 ha) (Regent of South Hulu Sungai, 2025d, 2025c, 2025b, 2025a). Figure 1 shows the position of Loksado within the Meratus Geopark and the location of the four customary territories analyzed in this study.



Shows the Delineation of the Meratus Geopark and the Position of the Loksado District. Source: Meratus Geopark Management Agency, Geospatial Information Agency, South Kalimantan Provincial Spatial Plan

Analysis Unit and Basis for Case Selection

The main analysis units of this study are customary territories as spatial units and customary spatial structures as analytical units. Thus, the focus of research is not only on indigenous communities as social groups, but also on how spaces within indigenous territories are classified, accessed, managed, and institutionalised. Case selection was purposive, guided by two criteria. First, customary territories must have obtained formal recognition from the local government. Second, the recognition document must include at least the following: information on customary territories, history and spatial planning, customary institutions, and maps of customary territories. This selection aligns with the research question, which specifically examines how recognised customary territories can be read as the initial basis for spatial integration. Therefore, this study is not intended to represent all customary territories in Meratus, but to analyse internal variations in groups of customary territories that have been officially documented and are quite complete.

Dimensions of Analysis and Research

Indicators

This study does not use quantitative variables but relies on four analytical dimensions, with document extraction indicators set from the outset to ensure the analysis remains transparent and traceable. The first dimension, the customary territory profile, is used to read the spatial and social context of each case through the territory's name, administrative location, area, number of communities or customary centres, landscapes, and dominant livelihoods. The second dimension, the structure of customary space, examines the local terms for space categories, the spatial functions listed in the document, and special elements such as sacred areas, rivers, and transition spaces, thereby becoming the core of customary spatial organisation

mapping. The third dimension, land tenure and access, includes communal rights, inheritance rights, buying and selling, renting, borrowing, and immigrant access to show that a specific access system also governs the structure of customary space. The fourth dimension, customary institutions and spatial governance, assesses the institutional structure, function of customary pangulu, supporting actors, and bakumpulan mechanisms to explain how the customary space order is maintained by local institutions that are still functioning. This framework is consistent with the study of customary land governance that emphasises the importance of reading social contexts, land rights systems, and institutional arrangements in an integrated manner (Adekola et al., 2023; Dawson et al., 2021; Kuusaana, 2022; Lankono et al., 2023), thus allowing for a more complete understanding of how the structure of customary spaces works while opening up a translation pathway to formal planning.

Data Sources and Data Collection Techniques

The data of this research is entirely based on secondary data in the form of four Decrees of the Regent of South Hulu Sungai in 2025 and their attachments, with a focus on the analysis on the determination of the recognition of customary law communities, descriptions and boundaries of customary territories, history and spatial planning of customary territories, customary institutional structures, and maps of customary territories. Data collection was carried out through document review and structured data extraction using pre-designed extraction sheets to ensure consistency across cases, particularly in recording local terms, land tenure forms, and governance elements. Through this procedure, customary terms such as katuan, kayuan, pahumaan, jurungan, balukar anum, kabun, and sacred areas are preserved in their original form before being grouped analytically, so that the structure of local

meaning is not prematurely reduced by external classification. The decision to make official documents the primary source is not purely practical but methodological, because this study specifically examines the relationship between formal recognition and the operational spatial reading of customary territories. In line with the argument that formal legal documents serve not only as administrative evidence, but also as a medium that records the spatial structure of customary customs that have been recognised by the local state (Dako et al., 2024; Karso, 2025), this approach allows research to place recognition documents as a substantive source to read the intersection between state recognition, customary land governance, and spatial planning frameworks.

Data Analysis Procedures

The analysis is carried out through five successive stages:

1. The first stage is the inventory and verification of documents to ensure that each case has a comparable data component, especially regarding customary territories, spatial planning, institutions, and maps.
2. The second stage is intensive reading and initial coding, in which the researcher identifies all local terms related to space categories, land tenure, and governance. At this stage, the analysis is conducted openly without imposing external classifications.
3. The third stage is thematic extraction and classification, which involves grouping information into four analytical dimensions: regional profiles, customary space structures, land tenure and access, and customary institutions. This stage uses the principle of qualitative content analysis because the main data are in the form of policy texts and narrative attachments that need to be analysed through categories, themes, and explicitly apparent conceptual relationships.

4. The fourth stage is *cross-case comparison*. At this stage, the researcher assessed the similarities and differences in spatial categories, land tenure, and institutions among the four customary territories. This comparison is important for identifying a common pattern that can be read as the structure of the Meratus-Loksado customary space, as well as for showing the local variations that still need to be maintained.
5. The fifth stage is the translation of the function of the space and the interpretation of planning. At this stage, the categories of customary spaces, such as *wood*, *katuan*, *pahumaan*, *jurungan*, *kabun*, *kampung*, and sacred areas, are grouped into spatial functions relevant to the reading of the plan, such as shelters, cultivation spaces, transition spaces, residential spaces, sacred spaces, and aquatic spaces. This translation is analytical, not normative. This means that the term local is retained as the original category, while the function of space is used to build a conceptual bridge between the customary spatial system and the formal spatial language.

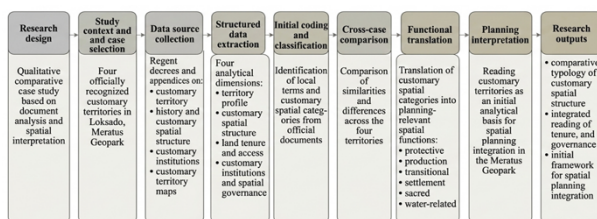


Figure 2. Flowchart Research Method

Reasons for Choosing Methods and Analysis

This method was chosen because it best suits the research question and the character of the data used. Because this study seeks to understand the spatial meanings of customary space categories, a qualitative approach is more appropriate than a quantitative one, which is less sensitive to context, local meaning, and the logic of space management. The focus on formally recognised customary territories also makes formal

recognition documents the most relevant data source for examining how those territories are represented as spaces. In this case, qualitative document analysis allows for systematic reading of existing texts while maintaining consistency, transparency, and traceability in the extraction of local terms and governance elements (Kiessling & Pütz, 2021; Morgan, 2022). Since this study is not intended to evaluate policy effectiveness or quantitatively measure spatial impacts, qualitative content analysis and cross-case comparisons are the most appropriate options to build an initial analytical framework and explain how institutional and governance factors shape spatial representations in different contexts (Follmann et al., 2023; Kiessling & Pütz, 2021). Thus, this method provides an adequate conceptual and empirical foundation for reading, mapping, and translating the structure of customary space into the context of careful planning for the Meratus Geopark.

Limitations Of Research Design and its

Implications for Interpretation

This research method inherently determines the limits of inference that can be drawn, so the results should be read as an analytical reconstruction of the documented structure of customary space, rather than as a thorough proof of actual spatial practices in the field. The reliance on official documents provides a solid basis for identifying space categories. However, it does not allow for a detailed exploration of boundary negotiations, seasonal variations, and social dynamics that shape customary space use, as this study does not include in-depth field observations, interviews, or participatory mapping. In addition, the absence of detailed GIS overlays with formal spatial instruments, including the Regional Spatial Plan (RTRW), Detailed Spatial Plan (RDTR), protected areas, and geopark zoning limits the ability of the research to quantitatively

assess the level of compatibility, wedge area, and potential conflicts between customary spatial structures and formal planning frameworks. However, these limitations do not weaken the position of this study, because it is methodologically aligned with the research objectives, which are indeed directed at the formation of a conceptual and comparative framework as the initial foundation of integration, rather than on operational spatial evaluation. In this context, this initial analytical framework is an important prerequisite for the research to proceed to a more advanced and rigorous GIS approach to test land-use suitability and spatial conflicts more precisely (Chen & Liu, 2023; Mansourihanis et al., 2023; Musikhin & Karpik, 2023).

RESULT

Profiles of the Four Recognised Customary Territories

The analysis shows that the four customary territories examined in this study differ in territorial extent, number of constituent communities, and socio-economic profile, yet all are situated within the mountainous and hilly landscape of Meratus. *Karukunan Balai Adat Datu Kandangan* covers 2,712.31 ha and includes nine customary halls in Muara Ulang Village. *Karukunan Balai Adat Keturunan Datu Mayawin-Urui* covers 1,603.36 ha in Loksado Village. *Karukunan Balai Adat Datung Makar* is the largest, covering 4,386.72 ha in Malinau Village, whereas *Balai Bayumbung* is the smallest, with an area of 769.20 ha in Halunuk Village. Across all four cases, the official recognition documents provide information on territorial boundaries, historical background, customary spatial structure, institutional arrangements, and customary territory maps, thereby offering a sufficient basis for reading these territories as formally documented spatial units.

Cross-case comparison also reveals differences in organizational scale. *Karukunan Balai Adat Datu Kandangan* consists of nine customary communities within a single territorial unit. *Karukunan Balai Adat Keturunan Datu Mayawin-Urui* comprises two communities, *Karukunan Balai Adat Datung Makar* includes three customary halls, and *Balai Bayumbung* consists of one customary hall. Despite these differences, the four cases share a broadly similar livelihood base centred on rubber tapping, farming, and gardening, although some local variations remain evident, such as bamboo raft production in *Balai Bayumbung*. This combination of a shared landscape context and variation in socio-territorial organization is analytically important because it provides an initial basis for assessing whether the customary spatial categories identified later in the analysis reflect case-specific features or point to a broader spatial pattern in Loksado.

To spatially situate the study's empirical scope, Figure 3 maps the locations of the four recognized customary territories within Loksado District and the broader Meratus Geopark landscape. As a basis for cross-case comparison, Table 1 summarizes the main territorial, environmental, and livelihood characteristics of the four recognized customary territories in Loksado.

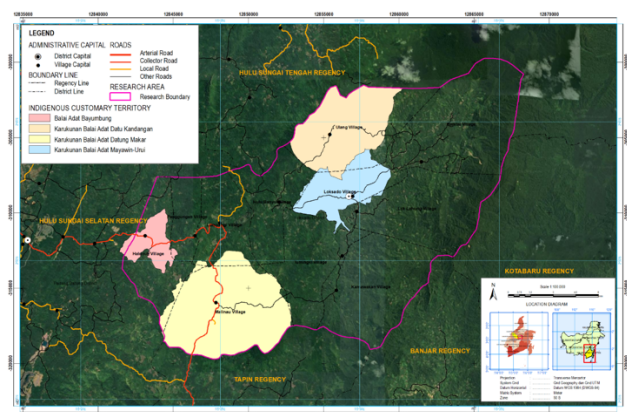


Figure 3. Location of the Four Recognised Customary Territories In Loksado within the Meratus Geopark Area. Source: Processed by the

author from the document of recognition of customary territories of four customary law communities in Loksado.

Table 1. Profile of the Four Recognised Customary Territories In Loksado.

Customary territory	Administrative location	Area (ha)	Communities / customary halls	Main landscape	Dominant livelihood	Language spoken
Karukunan Balai Adat Datu Kandangan	Muara Ulang Village, Loksado District, Hulu Sungai Selatan Regency	2,712.31	9	Plains and hills	Rubber tapping and perennial gardening	Dayak Loksado and Banjar
Karukunan Balai Adat Keturunan Datu Mayawin-Urui	Loksado Village, Loksado District, Hulu Sungai Selatan Regency	1,603.36	2	Plains and hills	Rubber tapping, swidden cultivation, and gardening	Dayak Loksado and Banjar
Karukunan Balai Adat Datung Makar	Malinau Village, Loksado District, Hulu Sungai Selatan Regency	4,386.72	3	Plains, hills, and Meratus uplands	Rubber tapping and mixed gardening	Banjar Pahuluan
Balai Bayumbung	Halumuk Village, Loksado District, Hulu Sungai Selatan Regency	769.20	1	Plains and hills	Rubber tapping, garden-based livelihoods, and bamboo raft making	Dayak Loksado and Banjar

Source: Compiled by the authors from official recognition documents.

Structure of Customary Spaces: Local Categories and Variations Between Cases

The second analytical dimension shows that all four customary territories possess internally differentiated spatial structures expressed through locally specific categories. Although the terminology varies across cases, these categories consistently represent distinct ways of organizing space according to ecological function, productive use, settlement, and customary significance. This indicates that customary territories are not undifferentiated areas, but rather internally ordered spatial systems grounded in local knowledge and practice.

In Karukunan Balai Adat Datu Kandangan, the documented categories include *katuan*, *kayuan*, *pahumaan*, *jurungan*, *kabun*, and *kampung*. Together, these categories distinguish sacred or protected forest, cultivated fields, fallow land, garden areas, and settlement space. In Karukunan Balai Adat Keturunan Datu Mayawin-Urui, the spatial structure is described in greater detail through categories such as *kayuan*,

pemukiman/pondok, *balukar anum*, *jurungan*, *pahumaan*, *perkebunan*, and *kawasan keramat*. Compared with the other cases, Mayawin-Urui presents a more explicit differentiation within transitional space, particularly through *balukar anum*, which refers to shrub-dominated former cultivation land that has not yet been fully reused.

Karukunan Balai Adat Datung Makar includes *katuan*, *pahumaan*, *jurungan*, *kabun*, *kampung*, *sungai*, and *tempat keramat*. This case is notable for a clearer articulation between terrestrial, riverine, and sacred space, including references to specific sacred locations. In Balai Bayumbung, the documented categories include *kayuan*, *pahumaan*, *jurungan*, *kabun*, *kampung*, and *tempat keramat*. Although the level of detail is somewhat less elaborate than in Mayawin-Urui or Datung Makar, the same underlying logic of spatial differentiation remains evident.

Across the four cases, several categories recur consistently, particularly *pahumaan*, *jurungan*, *kabun/perkebunan*, and *kampung/pemukiman*, suggesting a shared distinction between productive, transitional, and residential space. Other categories are more case-specific, such as *balukar anum* in Mayawin-Urui and *sungai* in Datung Makar, while sacred space appears in all cases but under different local expressions, including *katuan*, *kawasan keramat*, and *tempat keramat*. These variations indicate that, while customary spatial organization follows comparable functional logics, it remains closely shaped by local ecological conditions, livelihood practices, and cultural meanings.

To make these patterns explicit, Table 2 presents a comparative matrix of customary spatial categories across the four recognized territories and links them to their planning-relevant functions. Rather than repeating detailed descriptions for each case, the matrix highlights which categories are shared across

locally specific territories, and how they correspond to broader functional domains such as protective, productive, transitional, settlement, sacred, and water-related space. This comparative presentation provides the basis for the next analytical step, namely the translation of customary spatial categories into planning-relevant functional spaces.

Table 2. Comparative Customary Space Structure In Four Customary Areas In Loksado District.

Customary spatial category	Datu Kandangan	Mayawin-Urui	Datung Makar	Bayumbung	Planning-relevant function
Katuan	✓	–	✓	–	Protective/sacred
Kayuan	✓	✓	–	✓	Protective
Pahumaan	✓	✓	✓	✓	Productive
Jurungan	✓	✓	✓	✓	Transitional
Kabun / Perkebunan	✓	✓	✓	✓	Productive
Kampung / Pemukiman / Pondok	✓	✓	✓	✓	Settlement
Balukar anum	–	✓	–	–	Transitional
Kawasan keramat / Tempat keramat	–	✓	✓	✓	Sacred
Sungai	–	–	✓	–	Water-related

✓ = present in the documented customary spatial structure;

– = not explicitly identified in the official documents.

Source: Compiled by the authors from official customary spatial documents attached to the recognition decrees of the four recognized customary territories in Loksado.

Translating Spatial Functions: From Local Categories To Planning-Relevant Functions

Based on the analytical classification, the customary spatial categories identified across the four cases can be translated into a set of functions that are relevant to spatial planning. *Kayuan* and *katuan* are consistently associated with protective functions, as they refer to forest areas that are not opened for cultivation, are often located in upper landscape zones, and in some cases are also considered sacred. *Pahumaan* and *kabun/perkebunan* correspond to productive functions, as they represent spaces used for food production and perennial economic crops. *Jurungan* and

balukar anum are linked to transitional functions, reflecting phases of ecological recovery following cultivation. *Kampung*, *pemukiman*, and *pondok* correspond to settlement functions, while *kawasan keramat* and *tempat keramat* represent sacred space. In the case of *Datung Makar*, *sungai* also appears as a distinct category associated with water-related space that supports everyday livelihood activities.

These findings indicate that functional translation does not require replacing local terminology, but rather interpreting the spatial meanings explicitly documented in customary records. In this study, local terms are retained as original categories, while planning-relevant functions are used as an analytical bridge through which customary spatial structure can be read in relation to formal spatial planning. Within the limits of this research design, the results suggest that customary spatial categories display sufficient internal consistency to support functional classification, although this study has not yet tested their spatial alignment through detailed GIS overlay with formal planning maps. To visualize this analytical bridge, Figure 4 illustrates the translation of customary spatial categories into planning-relevant functional spaces.

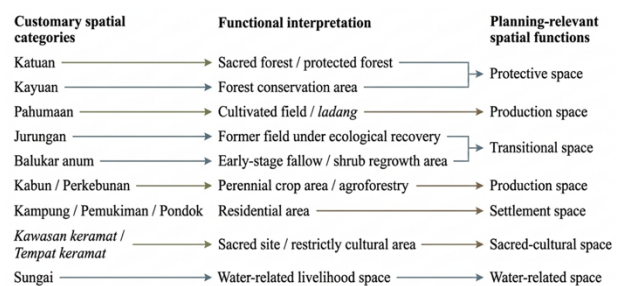


Figure 4. Translating Customary Spatial Categories Into Planning-Relevant Functional Spaces.

Source: Developed by the authors based on the analytical classification of customary spatial categories across the four recognized customary territories in Loksado.

Land Tenure and Access: The Tenure

Dimension of Customary Spatial Structure

The tenure dimension shows that all four customary territories combine communal rights and lineage-based inherited rights. Across all cases, customary forests, sacred forests, and certain upper landscape areas are treated as collectively held spaces, whereas cultivated land and gardens are more closely associated with family or lineage claims. This pattern indicates that customary spatial structure is not only a functional classification of land, but also a system of regulated access that determines who may use particular spaces and under what conditions. In this sense, customary space operates simultaneously as a spatial and tenure arrangement.

Cross-case comparison also reveals a broadly similar tenure structure across the four territories. All cases explicitly indicate communal rights in protected or sacred areas, inherited family-based claims, restricted sale and purchase, and access for outsiders through purchase, rental, or marriage. At the same time, all four cases show strong restrictions on land transfer to outsiders and a tendency for productive land to remain under family or lineage control. These recurring patterns suggest that, despite differences in local terminology and territorial configuration, customary tenure in Loksado is organized through a shared balance between collective control over protected space and lineage-based management of productive land.

The most notable variation appears in *Karukunan Balai Adat Keturunan Datu Mayawin-Urui*, which is the only case to explicitly identify rental and borrowing/lending arrangements as distinct forms of access. In the official documents, these mechanisms are linked to the limited availability of swidden land following the expansion of perennial crop gardens, which in turn requires some households to cultivate land

outside their own lineage holdings. This indicates greater flexibility in short-term access arrangements than in the other three cases. Even so, the broader tenure logic remains comparable: communal rights are concentrated in protected and sacred areas, while cultivated and productive land is primarily managed through lineage-based claims.

Overall, these findings show that the tenure dimension of customary space is plural rather than reducible to communal ownership alone. To make these patterns explicit, Table 3 presents a comparative matrix of land tenure and access arrangements across the four customary territories, highlighting both the common structure of rights and the main case-specific variation.

Table 3. Comparative Matrix of Land Tenure and Access Arrangements Across the Four Recognized Customary Territories In Loksado.

Tenure and access dimension	Datu Kandangan	Mayawin- Urui	Datung Makar	Bayumbung
Communal rights in protected/sacred areas	✓	✓	✓	✓
Inherited or lineage-based family rights	✓	✓	✓	✓
Restricted sale and purchase	✓	✓	✓	✓
Rental arrangements	✓	✓	✓	✓
Borrowing/lending arrangements	–	✓	–	–
Outsider access through purchase, rental, or marriage	✓	✓	✓	✓
Strong restrictions on transfer to outsiders	✓	✓	✓	✓
Productive land is mainly managed through family/lineage claims	✓	✓	✓	✓

Notes: ✓ = explicitly present in the official documents;

– = not explicitly identified as a separate category.

Source: Compiled by the authors from official customary tenure and access provisions in the recognition decrees of the four recognized customary territories in Loksado.

Customary Institutions and Spatial Governance

The fourth analytical dimension shows that all four customary territories share a broadly similar institutional structure. Across the cases, the main actors consist of the *pangulu adat*, the deputy *pangulu*, customary elders or community figures, and community

members. In all territories, the *pangulu adat* performs three core functions: leading rituals, resolving customary matters, and representing the community in its relations with external actors. The deputy *pangulu* assumes leadership responsibilities when necessary, while customary elders provide advice and guidance during deliberation and dispute resolution. This institutional arrangement indicates that customary space is governed through a recognizable structure of authority rather than through informal practice alone.

Cross-case comparison also shows a high degree of consistency in decision-making mechanisms. All four cases explicitly identify *bakumpulan*, or customary deliberation, as the primary forum for resolving disputes and reaching collective decisions. Although the setting may vary between the customary hall and the *pangulu*'s house, the overall procedure remains similar: customary authorities, elders, community members, and relevant parties are brought together to deliberate on disputes and spatial matters. This suggests that customary governance is embedded in social norms and supported by locally established procedures for mediation, coordination, and enforcement.

At the same time, the institutional patterns documented across the four territories indicate that spatial governance is closely linked to the regulation of access, land use, and customary authority. The presence of a relatively stable governance structure across cases reinforces the finding that customary spatial categories and tenure arrangements do not operate independently, but are maintained through living institutions that organize decision-making in practice. In this sense, customary space is sustained not only by spatial classification and tenure rules, but also by institutional mechanisms that give them legitimacy and continuity.

To make these governance patterns explicit, Table 4 compares the main customary actors, their roles, and the decision-making mechanisms documented across the four recognized customary territories. The table highlights the strong institutional continuity across cases while also showing how these arrangements support the practical governance of protected, productive, settlement, and sacred spaces.

Table 4. Customary Governance Structure and Decision-Making Mechanisms.

Governance dimension	Datu Kandangan	Mayawin- Urui	Datung Makar	Bayumbung
<i>Pangulu adat</i> present	✓	✓	✓	✓
Deputy <i>Pangulu</i> present	✓	✓	✓	✓
Customary elders/community figures involved	✓	✓	✓	✓
Community members involved in implementation	✓	✓	✓	✓
Ritual leadership role	✓	✓	✓	✓
Customary dispute resolution role	✓	✓	✓	✓
External representation role	✓	✓	✓	✓
<i>Bakumpulan</i> / customary deliberation explicitly identified	✓	✓	✓	✓
Spatial governance relevance documented	✓	✓	✓	✓

Notes: ✓ = explicitly present in the official documents.

Source: Compiled by the authors from official customary governance provisions in the recognition decrees of the four recognized customary territories in Loksado.

Implications for Spatial Integration

When the four analytical dimensions are read together, the findings indicate that recognized customary territories can be treated as an initial analytical basis for spatial planning integration in the Meratus Geopark. The customary spatial structures documented in official recognition records allow these territories to be read as spatial layers comprising protective, productive, transitional, settlement, sacred, and, in some cases, water-related spaces. At the same time, the tenure and institutional dimensions show that these spaces are not defined solely by physical function,

but are also regulated through living systems of access, authority, and decision-making.

From this perspective, recognized customary territories can be understood not merely as administratively acknowledged entities, but as territorially organized systems that contain spatial, tenure, and governance logics relevant to planning. This analytical shift is important because it allows customary territories to be considered as more than legal or cultural references within the geopark; they also provide an internally structured basis for interpreting how local space is organized and governed. In this study, this contribution remains at the level of analytical integration rather than operational planning design, but it nevertheless shows that the relationship between customary territory and formal spatial planning can be approached through a clearer conceptual framework.

Within the limits of the present research design, these findings do not yet provide a measured assessment of spatial compatibility, overlap, or conflict with formal planning instruments, since detailed GIS overlay analysis has not been undertaken. Even so, the results are sufficient to demonstrate that formal recognition of customary territories can be read beyond the administrative domain and extended into spatial and institutional interpretation. In this sense, the four recognized customary territories examined here can serve as reference units for future spatial analysis in the Meratus Geopark, particularly for more operational work involving participatory mapping, territorial overlay, and the alignment of customary spatial categories with formal planning frameworks.

As a synthesis of these findings, Figure 5 presents the analytical framework derived from this study for linking customary spatial structure, land tenure, and customary governance to the broader agenda of integrating geopark spatial planning.

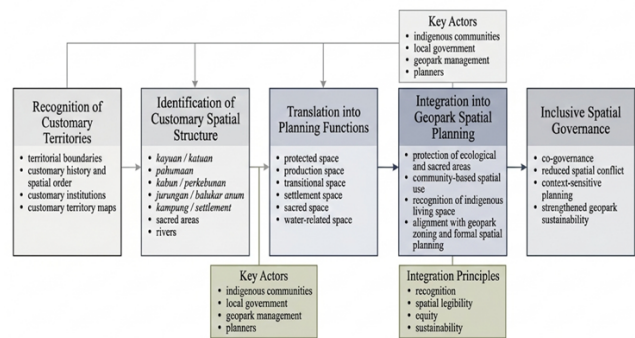


Figure 5. Analytical framework for Integrating Customary Spatial Structure Into Geopark Spatial Planning. Source: Developed by the authors based on the comparative analysis of four recognized customary territories in Loksado.

DISCUSSION

Customary Territories as Territorially Organized Spatial Systems

The findings show that the four recognized customary territories in Loksado should not be understood merely as socio-cultural entities or outcomes of administrative recognition, but as territorially organized systems containing spatial classifications, access rules, and governance mechanisms. This interpretation is directly linked to the objectives of the study, namely to identify customary spatial structure, compare variation across cases, and assess its relevance for spatial planning integration in the Meratus Geopark. In all four cases, the formal recognition documents contain the key elements required for a spatial reading of territorial boundaries, spatial categories, land access arrangements, customary institutions, and customary maps, allowing these territories to be treated as documented spatial units rather than simply as legal objects of recognition.

This interpretation is consistent with the literature, which conceptualizes customary territories as lived spaces shaped by social, ecological, and

institutional relations rather than by formal legal boundaries alone. At the same time, much of the previous research has focused more on rights recognition or indigenous peoples' participation in planning, while paying less attention to the analytical mechanisms by which customary territories can be read as planning-relevant spatial units. Studies on indigenous knowledge in territorial planning have emphasized the importance of integrating local knowledge into modern planning systems. However, the present study adds that such integration may begin with a systematic reading of spatial structures already documented in official recognition instruments. In this sense, the study's contribution lies not only in reinforcing the importance of indigenous peoples in planning but also in sharpening how formal recognition can serve as an analytical basis for spatial interpretation (Geyer, 2025; Milanese & Sibilla, 2025; Sukarman et al., 2025).

Customary Spatial Structure as A Form of Local Spatial Ordering

The results further show that customary spatial categories such as kayuan, katuan, pahumaan, jurungan, kabun, kampung, balukar anum, sacred areas, and rivers form a structured and functional system of spatial differentiation. Through these categories, customary territories are organized according to distinctions among protective, productive, transitional, residential, sacred, and, in some cases, water-related spaces. This pattern supports the interpretation of local terminology as a form of spatial ordering grounded in accumulated ecological experience, livelihood practices, and socially reproduced norms.

Conceptually, these findings reinforce the argument that indigenous knowledge is not limited to cultural values but also includes a spatial rationality that can be identified and used as an analytical basis for land-use governance. Accordingly, the main challenge in

land-use governance is not simply whether indigenous knowledge should be recognized, but how locally grounded spatial categories can be translated into formal decision-making without erasing their meanings, relations, and context. In the case of Loksado, the study shows that such translation is best undertaken through careful functional interpretation rather than by replacing indigenous terminology with technocratic labels. By doing so, the study not only confirms earlier scholarship but also extends it by showing more explicitly how local categories can be articulated within a broader planning-relevant functional structure (Deslatte et al., 2022; Howlett et al., 2025; Tang et al., 2025).

Territoriality, Tenure, and Governance as Interrelated Dimensions

The findings also demonstrate that customary spatial structure cannot be separated from land tenure and access arrangements. Across all four cases, space is organized through a combination of communal rights and inherited or lineage-based claims, with variation in the form of restricted sale, outsider access, and, particularly in Mayawin-Urui, more explicit rental and borrowing arrangements. This configuration confirms that customary space is not only a system of spatial classification, but also a tenure system that regulates who may use particular spaces, for what purposes, and under what conditions. In this sense, territoriality in customary territories always operates through the interaction of spatial function, access regulation, and local authority.

This reading is consistent with the literature on customary tenure, which views indigenous land regimes as plural, dynamic, and embedded in specific social and environmental histories. Rather than accepting a simplistic dichotomy between fully communal and fully individual ownership, this literature suggests that tenure security is better understood as the outcome of

negotiated combinations of rights linked to land use and social relations. In the present study, this plural arrangement becomes visible directly through customary spatial structure and access patterns. The findings therefore strengthen the argument that customary territories cannot be adequately understood through cultural identity or territorial boundaries alone; tenure and governance must also be considered, because it is precisely at the intersection of these three dimensions that the internal logic of customary spatial organization becomes most visible and most relevant for spatial planning analysis (Anafo et al., 2023; Geyer, 2025; Kuusaana, 2022; Sauls et al., 2022; Wegerif et al., 2025).

Customary Institutions and Their Relevance for Geopark Governance

The institutional similarity observed across the four cases, pangulu adat, deputy leaders, customary elders, community members, and bakumpulan as a deliberative mechanism, shows that customary spatial management is supported by living local institutions with authority and practical roles in conflict resolution. Customary space, therefore, should not be seen merely as a symbolic territorial division, but as a governance system maintained through institutionalized social procedures. In this study, the existence of customary institutions provides a strong basis for reading customary spatial structure not only as a classification of space, but also as a form of spatial governance that links access regulation, social legitimacy, and continuity in territorial management.

This becomes particularly relevant in the context of geoparks, because UNESCO emphasizes that UNESCO Global Geoparks are built through bottom-up processes and require governance arrangements that involve local actors while addressing socio-economic needs and protecting landscape and cultural identity. In

the geopark literature, the role of local communities is often framed in terms of participation, economic development, or community-based geotourism. The findings of this study refine that discussion by showing that, in customary territories, local involvement cannot be reduced to general participation, because it is already grounded in specific territorial and institutional arrangements. Community-based geopark management, therefore, remains relevant, but it needs to be interpreted more carefully, recognizing pre-existing customary institutions and their spatial logic. Under such conditions, conservation and sustainable development are more likely to succeed when local governance systems are strengthened rather than displaced by uniform external frameworks (Briggs et al., 2022; Dawson et al., 2021; Dwipati et al., 2025; Zhuang et al., 2024).

Practical Implications: From Administrative Recognition to an Initial Basis for Spatial Planning Integration

From a practical perspective, the results suggest that recognized customary territories can serve as an initial analytical basis for spatial planning integration in the Meratus Geopark. Mapping customary spatial structure enables us to read these territories as spatial layers containing protective, productive, transitional, settlement, sacred, and, in some cases, water-related spaces. In this study, the translation of customary categories is not intended to standardize local terminology, but rather to build a conceptual bridge between customary spatial systems and planning-relevant functions recognized within formal spatial planning. In this way, the recognition of customary territories can move beyond the administrative domain toward a more operational spatial interpretation.

The findings also offer more specific practical implications than a general call to “involve local

communities.” First, customary spatial categories can be used to build planning-compatible spatial classifications without removing local nomenclature. Second, customary territory maps can serve as a foundational layer for geopark spatial analysis. Third, customary institutions can be incorporated into consultation processes or limited co-governance arrangements for issues related to protected areas, sacred spaces, and access regulation. The literature on geoparks and inclusive planning suggests that culturally sensitive collaborative frameworks are necessary to connect formal governance with local knowledge. The present findings do not claim that such an integration model is already complete, but they do indicate that a more operational integration pathway is available (Ab Rahman et al., 2025; Aragão et al., 2025; Huang et al., 2024; Knickel et al., 2021).

Limits of Interpretation and the Study’s

Contribution

The interpretation offered in this study should be understood within the limits of its research design and data quality. First, the analysis relies on official recognition documents, meaning the results should be read as an analytical reconstruction of documented customary spatial structure rather than as a full verification of everyday spatial practice. Second, the study has not yet incorporated in-depth field validation or detailed GIS overlay with RTRW, RDTR, or formal geopark zoning, and therefore cannot assess spatial compatibility, overlap, or conflict in a measured way. Third, the study is limited to four recognized customary territories and does not represent the full diversity of customary territories in Meratus, especially those that have not yet received formal recognition. For these reasons, the findings should be interpreted as an initial conceptual and analytical basis rather than a final integration model ready for direct application.

Within those limits, however, the study’s contribution remains clear. It shows that official recognition documents of customary law communities can be read not only as legal records, but also as valuable sources of spatial, tenure, and institutional data for planning analysis. The contribution does not lie in claiming that customary spatial structure can replace formal spatial planning, but in sharpening the argument that geopark planning will be stronger when it can translate local spatial knowledge into an operational analytical framework. In this sense, the study contributes simultaneously to the literature on customary territories and spatial planning: it shifts the discussion from recognition toward spatial interpretation, and from general participation toward the possibility of more structured forms of integration (Mo et al., 2023; Rosado-González et al., 2023).

LIMITATIONS

This study is based on a qualitative comparative case design using official recognition documents as its primary source of evidence. Its analytical strength lies in the systematic reading of formally recognized customary territories, but this also means that the findings depend on the scope, consistency, and depth of information contained in those documents. The results should therefore be understood as an analytical reconstruction of documented customary spatial structure rather than as a full account of everyday spatial practice. In particular, the study does not include in-depth field verification through direct observation, interviews with customary authorities, or participatory mapping. As a result, categories such as jurungan, balukar anum, and sacred areas can be identified and interpreted from the documents, but their practical variation across actors, locations, and time cannot yet be fully assessed.

A second limitation concerns both spatial analysis and case coverage. The study does not conduct a detailed GIS overlay of customary territories with formal planning instruments such as RTRW, RDTR, protected areas, infrastructure networks, or geopark zoning. It therefore cannot provide a measured assessment of the spatial compatibility, overlap, or conflict between customary and formal planning structures. In addition, the analysis is limited to four territories that have already received formal recognition, which improves comparability but restricts broader generalization to other customary territories in Meratus, especially those that remain unrecognized or institutionally different. Finally, the translation of customary spatial categories into planning-relevant functions inevitably involves some simplification, since many local categories carry ecological, social, historical, and spiritual meanings simultaneously. For these reasons, the study should be read as providing an initial conceptual and analytical basis for spatial planning integration rather than a final operational model.

FUTURE RESEARCH

Future research should move beyond document-based interpretation toward field-based spatial and institutional validation. The most relevant next step is to combine document analysis with participatory mapping, in-depth interviews with customary authorities, and field transects in order to examine how categories such as kayuan, jurungan, balukar anum, and sacred areas are practiced, bounded, and negotiated in everyday spatial use. This would allow the analytical categories identified in the present study to be tested against lived territorial practice rather than official documentation alone.

Further work is also needed to integrate GIS-based analysis by overlaying customary territories with RTRW, RDTR, protected areas, infrastructure

networks, and Meratus Geopark zoning. Such an approach would enable more precise assessment of alignment, overlap, and potential spatial conflict, moving the discussion from conceptual integration to operational planning recommendations. Future studies should also expand the empirical scope to include customary territories that have not yet received formal recognition or that represent different socio-ecological settings across Meratus. At the same time, there is room to develop a more explicit framework linking territoriality, tenure, governance, and planning translation. This would help clarify how spatial integration depends not only on functional classification but also on authority, access, and negotiated decision-making, thereby contributing to more grounded models of co-governance for geopark management and community-based spatial planning.

CONCLUSION

This study shows that the four formally recognized customary territories in Loksado can be read as spatial units with relatively clear spatial structure, access arrangements, and governance institutions. Through comparative document analysis, it finds that categories such as kayuan, katuan, pahumaan, jurungan, kabun, kampung, sacred areas, and rivers do not merely represent local terms, but constitute a spatial logic that can be translated analytically into planning-relevant functions, namely protective, productive, transitional, settlement, sacred, and water-related spaces. In relation to the research question, these findings indicate that customary spatial structure in the four recognized customary law communities can be mapped systematically and provide an initial basis for spatial planning integration in the Meratus Geopark.

The main contribution of the study lies in bridging formal recognition of customary territories with a more operational spatial reading. It shows that

official recognition documents are not only legally important but also contain spatial, tenure, and institutional information that is valuable for planning analysis. In this way, the article contributes to the literature in two related respects: first, by demonstrating that customary territories can be understood as functional territorial systems; and second, by offering an initial framework for translating customary spatial categories into the analytical language of spatial planning without removing their original terms and underlying local logics.

At the same time, the conclusion must be read within the limits of the research design. The findings support the use of customary territories as an initial conceptual and analytical basis for spatial integration, but they do not yet provide an operational spatial evaluation or a final implementation model. The value of the study, therefore, lies not in claiming that customary spatial structure can replace formal planning, but in showing that spatial planning in geopark areas can be strengthened when it begins from a more systematic understanding of local spatial structure, access arrangements, and living governance systems.

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