Oil and Gas Industry Investment and Its Implications for Tenurial Conflict: A Study on Land Disputes in Teluk Bintuni Regency, West Papua Province

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Abstract. This study aims to analyze the structure of stakeholder networks and the key factors influencing tenurial conflicts arising from oil and gas (O&G) industry investments in Teluk Bintuni Regency, West Papua. The Stakeholder Network Analysis (SNA) approach was employed to map the relationships of power, interest, and influence among actors at traditional, local, regional, national, and international levels. The network analysis reveals that BP Tangguh LNG, SKK Migas, and the Teluk Bintuni District Government occupy central positions with the highest degree of influence, while the Sebyar and Sumuri indigenous communities remain on the periphery with low connectivity but high social and environmental vulnerability. Further, the Cartesian mapping of actors based on High–Low Conflict and Vulnerability dimensions identifies four main clusters High Conflict–High Vulnerable (indigenous communities, local NGOs), High Conflict–Low Vulnerable (oil and gas companies), Low Conflict–High Vulnerable (local government and customary institutions), and Low Conflict–Low Vulnerable (central government and foreign investors). Using SNA, the study found that the dominant factors influencing tenurial conflict are the perceived injustice in benefit distribution (loading = 0.82), weak consultation and FPIC mechanisms (0.78), and overlapping spatial policies (0.73). These findings underscore the importance of developing a collaborative governance model rooted in tenurial justice and indigenous participation for sustainable O&G investment in Papua.

Keywords: oil and gas investment, tenurial conflict, West Papua, stakeholder network analysis, indigenous peoples

1 INTRODUCTION

Oil and gas (O&G) development has long been promoted as a catalyst for regional economic growth and infrastructure advancement in Indonesia's eastern frontier [1] [2]. In West Papua, particularly Teluk Bintuni Regency, the expansion of industrial investment under the Tangguh LNG Project represents a cornerstone of national energy security and global energy trade [3] [4]. Yet, beneath these economic promises lies a series of tenurial disputes that reveal deeper tensions between state- led development, corporate expansion, and indigenous land rights [5] [6]. These conflicts often emerge from overlapping spatial plans, weak participatory mechanisms, and the erosion of traditional governance over customary (ulayat) lands.

The complexity of tenurial conflict in Teluk Bintuni arises from the multiplicity of stakeholders—ranging from indigenous clans, local and provincial governments, to multinational corporations and national regulatory bodies—each with competing claims, interests, and levels of power [7]. This study investigates how oil and gas investments reshape local socio-political structures and explores how institutional interactions either mitigate or exacerbate land-based disputes.

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Teluk Bintuni is one of Indonesia's largest LNG-producing regions, contributing significantly to national exports and state revenue. The Tangguh LNG project, operated by BP (British Petroleum) under the supervision of SKK Migas, covers an area intersecting the customary territories of the Sebyar, Sumuri, and Sough ethnic groups, among others from the region's seven major tribes [4]. These lands embody not only material value but also social and spiritual significance for indigenous Papuan communities.

Despite formal recognition of customary land (tanah ulayat) within Indonesia's legal framework, actual governance remains fragmented [8] [9] [10]. Permitting processes for oil and gas exploitation often bypass Free, Prior, and Informed Consent (FPIC) procedures, limiting indigenous participation [11] [12]. Meanwhile, state institutions such as the Ministry of Agrarian Affairs (ATR/BPN) and the Ministry of Environment and Forestry (KLHK) maintain jurisdictional overlaps that perpetuate uncertainty in land ownership and spatial boundaries [8] [3]. This institutional dissonance has produced both latent and manifest conflicts, ranging from disputes over compensation to protests and legal contestations.

Empirical evidence from field studies and institutional reports (2018–2024) indicates that more than 65% of tenurial disputes in Teluk Bintuni are linked to extractive industry expansion and overlapping permits. Approximately 21 customary territories (marga) have reported direct or indirect impacts from oil and gas infrastructure development. Local NGOs and the Majelis Rakyat Papua Barat (MRPB) have documented recurring grievances related to unfulfilled compensation, limited employment inclusion, and ecological degradation. Government agencies and investors cite regulatory ambiguity and competing land-use priorities as key barriers to effective conflict resolution.

The Stakeholder Network Analysis (SNA) conducted in this study identifies BP Tangguh LNG, SKK Migas, and the Teluk Bintuni Regency Government as the most central and influential actors, while customary leaders, local NGOs, and church institutions occupy peripheral yet highly vulnerable positions. Previous studies on extractive industries in Papua and other frontier regions have focused largely on economic impact assessments, corporate social responsibility (CSR), or environmental externalities, but have paid limited attention to the networked structure of tenurial conflicts [13]—how power, trust, and participation circulate among multi-level actors. There remains a lack of empirical understanding of how perceptions of distributive justice influence the escalation of conflict, how FPIC mechanisms (or their absence) affect trust and negotiation outcomes, how institutional overlaps in spatial governance perpetuate contestations over land rights [14] [15] [16].

This study fills that gap by integrating Stakeholder Network Analysis (SNA) to quantitatively assess how social, political, and institutional variables interact in shaping tenurial conflict outcomes. The main objectives of this study are to map the structure and interrelationships among stakeholders involved in oil and gas investment in Teluk Bintuni, analyze social and cultural profiles of indigenous groups (the seven tribes) and their traditional land governance systems, assess the economic implications of oil and gas investment for local livelihoods and customary landowners, identify key institutional actors influencing tenurial relations and power asymmetries, and evaluate the determinants influencing trust, participation, and conflict intensity using SEM-PLS modeling. Ultimately, the study aims to develop a collaborative land governance framework rooted in tenurial justice, inclusive participation, and indigenous sovereignty, offering policy recommendations for sustainable extractive industry management in Papua.

2 MATERIALS AND METHOD

2.1 Research Design

This research employs a mixed-methods approach, combining quantitative analysis of institutional relationships with qualitative assessments of socio-political dynamics and tenurial disputes. The design integrates stakeholder mapping, conflict vulnerability analysis, and hierarchical clustering to identify and categorize actors based on their involvement, influence, and exposure to land-related conflicts arising from oil and gas investment activities in Teluk Bintuni Regency.

2.2 Study Location

The research was conducted in Teluk Bintuni Regency, West Papua Province, which hosts one of Indonesia's argest onshore natural gas developments—the Tangguh LNG Project. The area represents a complex socio-ecological and political environment involving indigenous land tenure systems, corporate investment, and multi-level governance institutions.

2.3 Data Collection Techniques

Primary data were gathered through In-depth interviews with 29 key institutional actors, including traditional councils (Lembaga Adat), customary landowners (Suku/Marga Adat), local and provincial governments, national ministries (ATR/BPN, ESDM, KLHK, KEMENDAGRI), and oil and gas corporations. Focus Group Discussions (FGDs) conducted with five community clusters across affected villages to explore perceptions of land rights, benefit-sharing, and institutional accountability. Direct observation of local administrative procedures and customary dispute settlements.

Secondary data included policy and legal documents related to land administration, spatial planning, and energy investment. Reports and archives from SKK Migas, BPN, and the Teluk Bintuni Government. Academic and NGO publications on land conflicts and indigenous governance in Papua (Table 1).

TABLE 1. Institutional Categories, Entities, and Roles in Oil and Gas Investment and Tenurial Conflict Governance in Teluk

No	Category	Nama / Entity	Roles and Interests
1	Customary Council	Papuan Customary Council (DAP) - Region III Doberay / Sub-region of Bintuni	Represents the aspirations of indigenous peoples; negotiates customary land rights and compensation mechanisms
2	Indigenous Tribes / Clans	Sebyar, Sumuri, Wamesa, Irarutu, Kuri, and Moskona Tribes	Customary landowners whose territories are the sites of oil and gas exploration and exploitation
3	Traditional Leaders / Clan Chiefs	Ondoafi, Clan Leaders, Customary Elders	Collective decision-makers on land release and acceptance of investment activities
4	Local Church Institutions (Moral Representation)	GKI in Tanah Papua, Catholic Diocese of Manokwari–Sorong	Moral mediators and advocates of social justice in response to the socio- environmental impacts of investments
5	Regency Government	Regent of Teluk Bintuni and related offices (Environment, Land, Labor, Licensing)	Spatial planning authority, licensing, distribution of CSR and social compensation funds
6	National Land Agency (BPN) – Bintuni	Teluk Bintuni District Land Office	Verification of land rights, land certification, and resolution of administrative land disputes
7	Local Legislative Council	Teluk Bintuni Regency DPRD	Oversight of investment policies and land-use regulations
8	Local NGOs	Papua Community Development Foundation (YPMP), LP3BH Manokwari (covering Bintuni)	Advocacy on tenurial conflicts, environmental issues, and indigenous rights.
9	Local Communities / Farmer– Fisher Groups	Communities in Babo, Tembuni, and Aranday Districts	Directly affected by land-use changes and loss of access to natural resources.
10	Local Media	Radio Bintuni, local online media	Publishes reports on conflict dynamics and corporate CSR practices.
11	Provincial Government	Governor and Bappeda of West Papua Province	Coordinates regional development planning and strategic investment alignment.
12	Provincial Office of Energy and Mineral Resources	Division of Oil, Gas, and New Energy	Supervises oil and gas company operations within the province

13	Provincial Office of Forestry and Environment	-	Oversees Environmental Impact. Assessments (EIA/AMDAL) and environmental licensing.
14	West Papua People's Assembly (MRPB)	Adat, religious, and women's representative body	Protects fundamental rights of indigenous communities in national strategic projects
15	Provincial Office of the National Land Agency	-	Provides technical guidance on land management and mediates inter-district land disputes.
16	Ministry of Energy and Mineral Resources (ESDM)	Directorate General of Oil and Gas	Main regulator for oil and gas investment and the allocation of working areas (WK).
17	SKK Migas	Special Task Force for Upstream Oil and Gas Business Activities	Supervises and controls oil and gas contractors (KKKS) operating in Teluk Bintuni (e.g., Tangguh LNG).
18	Ministry of Agrarian Affairs and Spatial Planning / National Land Agency	-	Regulates land tenure systems and maintains the national tenurial mapping database.
19	Ministry of Environment and Forestry (KLHK)	-	Oversees environmental licenses, EIA implementation, and forest area designation.
20	Ministry of Home Affairs (Kemendagri)	-	Synchronizes local autonomy policies and land-conflict resolution mechanisms
21	Ministry of Investment / BKPM	-	Approves industrial investments and ensures a stable investment climate.
22	House of Representatives (DPR RI)	-	Oversees legislative frameworks and national laws on oil and gas investment.
23	National Human Rights Commission (Komnas HAM)	-	Handles human rights issues related to land tenure and indigenous rights violations.
24	Constitutional Court and Supreme Court	-	Enforces legal rulings on land disputes involving customary land rights (hak ulayat).
25	Multinational Oil and Gas Companies	BP (British Petroleum), Mitsui, CNOOC (China National Offshore Oil Corporation)	Major shareholders and operators of the Tangguh LNG Project in Teluk Bintuni
26	International Financial Institutions	IFC–World Bank, Asian Development Bank (ADB)	Provide financial support for energy and sustainable development projects.
27	International NGOs	WWF, Oxfam, Global Witness	Advocate for environmental justice and protection of indigenous communities rights.
28	Home Governments of Foreign Investors	UK, Japan, China	Provide diplomatic and investment support to their respective national corporations.
29	United Nations Agencies	UNDP, UNDRIP Forum	Monitor adherence to international standards such as the Free, Prior, and Informed Consent (FPIC) principle.

Note: 1: Lembaga Adat (LA), 2: Suku / Marga Adat (SMA), (3) Pemimpin Adat / Kepala Marga (PAKM), (4) Lembaga Gereja Lokal (LGL), (5) Pemerintah Kabupaten (PK), (6) Badan Pertanahan Nasional (BPN) Bintuni (BPNB), 7: DPRD Kabupaten Teluk Bintuni (DPRDTB), 8: Lembaga Swadaya Masyarakat (LSM) lokal (LSML), 9: Komunitas Lokal / Kelompok Tani dan Nelayan (KLKTN), 10: Media Lokal (ML), 11: Pemerintah Provinsi Papua Barat (PPPB), 12:Dinas ESDM Provinsi Papua Barat (DESDMPB), 13: Dinas Kehutanan dan Lingkungan Hidup Provinsi (DKLHPB), 14: Majelis Rakyat Papua Barat (MRPB), 15: Kantor Wilayah BPN Provinsi Papua Barat (KWBPNPB), 16: Kementerian Energi dan Sumber Daya Mineral (KESDM), 17: SKK Migas (SKKM), 18: Kementerian Agraria dan Tata Ruang / BPN RI (KATRBPN), 19: Kementerian Lingkungan Hidup dan Kehutanan (KLHK), 20: Kementerian Dalam Negeri (KDN), 21: Kementerian Investasi / BKPM (KIPKPM), 22: Dewan Perwakilan Rakyat (DPR RI), 23: Komnas HAM (KHAM), 24: Mahkamah Konstitusi dan MA (MKMA), 25: Perusahaan Migas Multinasional (PMM), 26: Lembaga Keuangan Internasional (LKI), 27: NGO Internasional (NGOI), 28: Pemerintah Asal Investor (PAI), 29: United Nations Agencies (UNA).

Based on Table 1, the governance of oil and gas investment and tenurial conflicts in Teluk Bintuni involves multiple actors operating at local, regional, national, and international levels. These actors include customary institutions, government bodies, private companies, civil society organizations, and international institutions, each with different roles and interests in managing land rights, investment activities, and environmental and social impacts.

2.4 Sampling Framework

Respondents were categorized into institutional clusters representing: Customary and Local Actors (9 institutions) – e.g., Lembaga Adat, Suku/Marga Adat, Local Church, Farmers/Fishers Groups. District and Provincial Authorities (6 institutions) – e.g., Local Government, DPRD Teluk Bintuni, Provincial Forestry and Environment Agency. National Agencies (8 institutions) – e.g., ATR/BPN RI, ESDM, KLHK, KEMENDAGRI, SKK Migas. International and Private Actors (6 institutions) – e.g., Multinational Oil Companies, International NGOs, and UN Agencies. A total of 29 actors were analysed using institutional network and cluster mapping.

2.5 Data Analysis Procedures

Each institutional actor was scored based on Level of conflict engagement (1–5 scale), Level of vulnerability/exposure (1–5 scale), Institutional influence/power (qualitative coding based on policy authority, funding, and territorial scope). Scores were standardized and compiled into a conflict-vulnerability matrix, serving as input for cluster analysis.

The HCA (Rao 2018) was performed using Ward's Method and Euclidean Distance, visualized in a dendrogram (as shown in the figure). The Y-axis (Vulnerability) reflects exposure level to socio-economic and environmental impacts. The X-axis (Institutions) reflects the degree of involvement in tenurial conflict (Low–High Conflict). This approach grouped the 29 actors into four clusters, each corresponding to one of the four quadrants of the conflict–vulnerability map.

Quadrant Interpretation and Typology. The clustering results were interpreted through quadrant analysis, identifying four institutional typologies: Quadrant I – High Conflict–Low Vulnerability: Dominant policy actors. Quadrant II – High Conflict–High Vulnerability: Local and customary actors. Quadrant III – Low Conflict–High Vulnerability: Reactive civil society actors. Quadrant IV – Low Conflict–Low Vulnerability: National and

international institutions. Each typology was further validated through interview triangulation and cross-referencing of institutional mandates.

Policy Network Mapping. Using qualitative coding software, textual data from interviews were analyzed to visualize policy interaction networks among actors. The analysis identified patterns of collaboration, contestation, and governance asymmetry within the tenurial system.

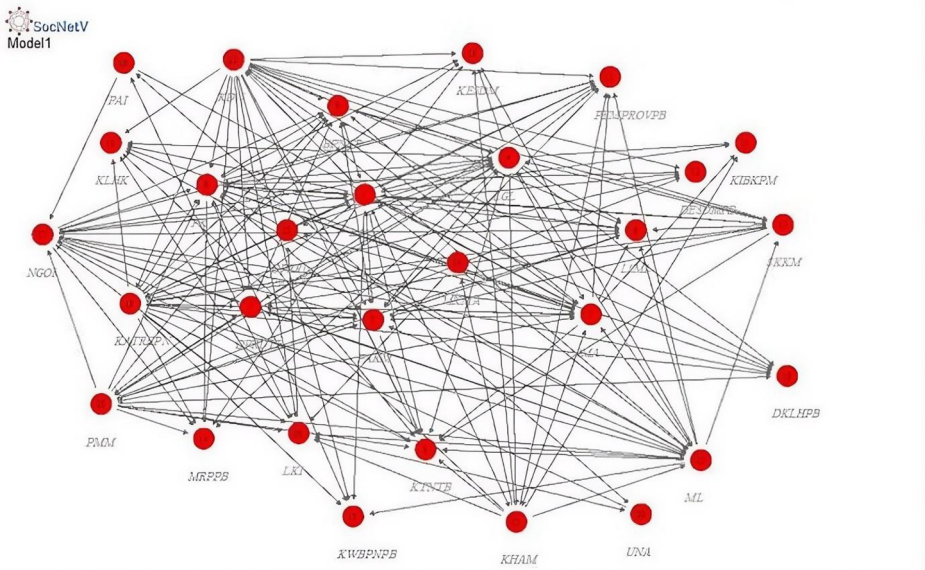

FIGURE 1. Relationship and Mapping Connectivity using SNA

Note: 1: Lembaga Adat (LA), 2: Suku / Marga Adat (SMA), (3) Pemimpin Adat / Kepala Marga (PAKM), (4) Lembaga Gereja Lokal (LGL), (5) Pemerintah Kabupaten (PK), (6) Badan Pertanahan Nasional (BPN) Bintuni (BPNB), 7: DPRD Kabupaten Teluk Bintuni (DPRDTB), 8: Lembaga Swadaya Masyarakat (LSM) lokal (LSML), 9: Komunitas Lokal / Kelompok Tani dan Nelayan (KLKTN), 10: Media Lokal (ML), 11: Pemerintah Provinsi Papua Barat (PPPB), 12:Dinas ESDM Provinsi Papua Barat (DESDMPB), 13: Dinas Kehutanan dan Lingkungan Hidup Provinsi (DKLHPB), 14: Majelis Rakyat Papua Barat (MRPB), 15: Kantor Wilayah BPN Provinsi Papua Barat (KWBPNPB), 16: Kementerian Energi dan Sumber Daya Mineral (KESDM), 17: SKK Migas (SKKM), 18: Kementerian Agraria dan Tata Ruang / BPN RI (KATRBPN), 19: Kementerian Lingkungan Hidup dan Kehutanan (KLHK), 20: Kementerian Dalam Negeri (KDN), 21: Kementerian Investasi / BKPM (KIPKPM), 22: Dewan Perwakilan Rakyat (DPR RI), 23: Komnas HAM (KHAM), 24: Mahkamah Konstitusi dan MA (MKMA), 25: Perusahaan Migas Multinasional (PMM), 26: Lembaga Keuangan Internasional (LKI), 27: NGO Internasiaonal (NGOI), 28: Pemerintah Asal Investor (PAI), 29: United Nations Agencies (UNA).

Figure 1 illustrates the policy network connectivity among the identified actors using Social Network Analysis (SNA). The numerical codes (1-29) represent different institutional actors involved in oil and gas investment governance and tenurial conflicts in Teluk Bintuni.

To measure the strength of relationships among these actors, a Pearson Product-Moment Correlation (PPC) matrix was applied. The correlation coefficient (r) ranges from -1.0 to +1.0, indicating the degree of association between institutions. Positive values indicate collaborative tendencies, values close to zero suggest weak or independent relationships, and negative values indicate conflicting or opposing interactions.

2.6 Data Validation and Triangulation

Triangulation was conducted through cross-checking between interview responses and legal documents. Comparing cluster results with expert judgment from local universities and NGOs; Conducting a feedback workshop with representatives from key institutions to validate interpretations.

2.7 Ethical Considerations

Ethical clearance was obtained from the local research authority in West Papua. All respondents participated voluntarily with informed consent, and culturally sensitive protocols were followed, particularly in engaging with indigenous communities and customary leaders.

3 RESULTS AND DISCUSSION

3.1 High Conflict, Low Vulnerability

The horizontal axis (X-axis) represents Institutions, indicating the level of conflict ranging from Low Conflict to High Conflict. The vertical axis (Y-axis) represents Vulnerability, showing the degree of exposure or risk from Low Vulnerability to High Vulnerability. The diagram is divided into four quadrants, illustrating the position and role of each actor within the context of tenurial conflicts arising from oil and gas investments in Teluk Bintuni Regency, West Papua Province. The positioning of actors within these quadrants is presented in Figure 2.

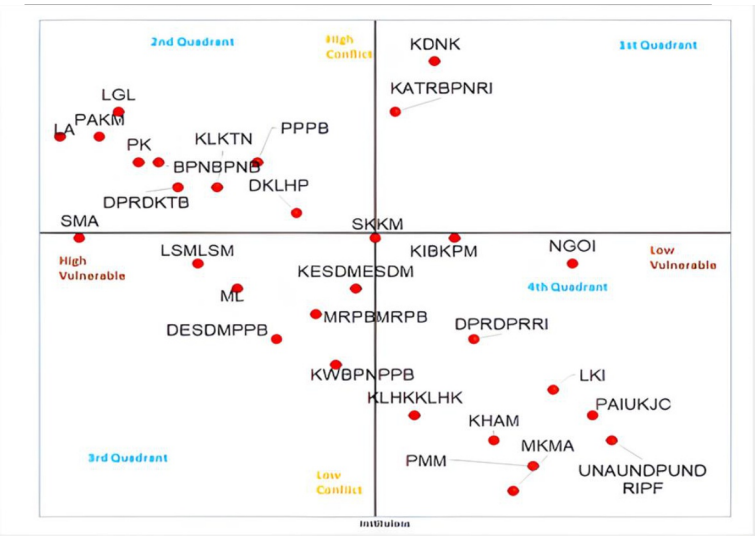

FIGURE 2. Diagram of Cartesian for Mapping Conflict and Vulnerable Actors

Note: 1: Lembaga Adat (LA), 2: Suku / Marga Adat (SMA), (3) Pemimpin Adat / Kepala Marga (PAKM), (4) Lembaga Gereja Lokal (LGL), (5) Pemerintah Kabupaten (PK) (6) Badan Pertanahan Nasional (BPN) Bintuni (BPNB), 7: DPRD Kabupaten Teluk Bintuni (DPRDTB), 8: Lembaga Swadaya Masyarakat (LSM) lokal (LSML), 9: Komunitas Lokal / Kelompok Tani dan Nelayan (KLKTN), 10: Media Lokal (ML), 11: Pemerintah Provinsi Papua Barat (PPPB), 12:Dinas ESDM Provinsi Papua Barat (DESDMPB), 13: Dinas Kehutanan dan Lingkungan Hidup Provinsi (DKLHPB), 14: Majelis Rakyat Papua Barat (MRPB), 15: Kantor Wilayah BPN Provinsi Papua Barat

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Actors involved are Ministry of Home Affairs (KDN), Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN RI). These are powerful state actors with high involvement in conflict management but low exposure to its direct impacts. Typically, they represent central government institutions that shape national policies and regulations, particularly those governing land tenure and spatial planning. While they play a decisive role in defining the legal and administrative frameworks of land governance, they remain largely insulated from the socio-economic tensions occurring at the local level.

3.2 High Conflict, High Vulnerability

Actors included are Customary Council (LA), Indigenous Tribes/Clans (SMA), Traditional Leaders (PAKM), Local Churches (LGL), Regency Government (PK), National Land Agency – Bintuni (BPNB), Local Parliament (DPRD-TB), Local Communities (KLKTN), Provincial Environment Agency (DKLHP), Provincial Government (PPPB). This group consists primarily of local and indigenous actors—those most exposed to the pressures and risks of oil and gas investment. They represent customary landowners, clan chiefs, moral authorities (churches), and local governments who face the immediate consequences of land- use conversion and overlapping claims. Despite being at the heart of conflict dynamics, these actors possess limited influence and bargaining power in negotiations over land rights, permits, and benefit-sharing mechanisms. Their position reflects deep structural asymmetry within the governance framework.

3.3 Low Conflict, High Vulnerability

Actors consist of Local NGOs (LSM), Local Media (ML), Provincial Energy Office (DESDM-PB), West Papua People's Assembly (MRPB), Regional Land Office (KWBPN-PB), Ministry of Environment and Forestry (KLHK). These actors face relatively fewer conflicts but remain socially and ecologically vulnerable due to imbalanced governance structures. Their involvement is typically reactive, focusing on advocacy, information dissemination, and environmental monitoring. Although they play a critical role in raising awareness and accountability, their institutional power is limited, and their participation often depends on issue-specific or donor-driven agendas.

3.4 Low Conflict, Low Vulnerability

Actors consist of SKK Migas, Ministry of Energy and Mineral Resources (KESDM/ESDM), Ministry of Investment (BKPM), International NGOs (NGOI), National Parliament (DPR RI), International Financial Institutions (LKI), Investor Home Governments (UK, Japan, China), Multinational Oil Companies (PMM), National Human Rights Commission (Komnas HAM), Constitutional and Supreme Courts (MK–MA), United Nations Agencies (UNDP, UNDRIP Forum). These are national and international powerholders—

institutions with strong regulatory authority, financial capital, and political leverage, but minimal vulnerability. They drive strategic decision-making in the oil and gas sector, shape investment policies, and influence conflict-resolution mechanisms. While their reach and resources are vast, their social presence on the ground is limited, resulting in a governance gap between top-level policy and local realities.

3.5 Power Relationship Patterns

The further an actor moves rightward (High Conflict), the greater their role in creating, managing, or mediating disputes. The higher they move upward (High Vulnerability), the more exposed they are to the socio-economic and ecological consequences of those conflicts. Local and indigenous actors (Quadrant II) bear the highest social and environmental costs while holding minimal power or representation. In contrast, national and global actors (Quadrant IV) exert dominant control with limited exposure to risks or accountability.

Strengthen FPIC (Free, Prior, and Informed Consent) mechanisms to ensure that indigenous voices are meaningfully integrated into decision-making processes. Enhance cross-sectoral coordination among ATR/BPN, ESDM, and KLHK to reduce overlapping spatial and land-use conflicts. Promote co-governance frameworks between central and local institutions to achieve more equitable and inclusive tenurial justice within oil and gas regions.

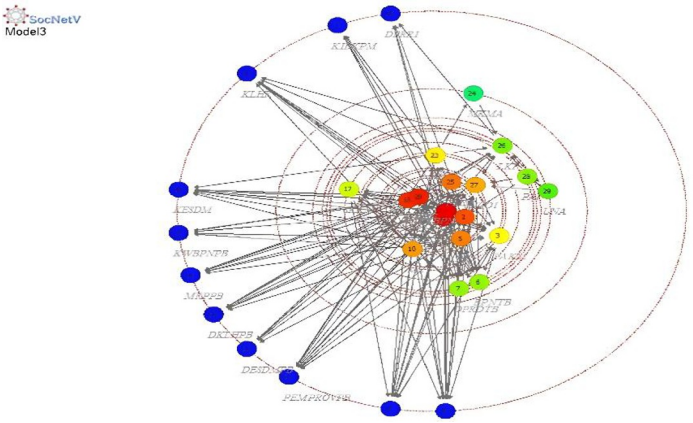

FIGURE 3. Radial Diagram in Mapping Actors Power using SNA

Note: 1: Lembaga Adat (LA), 2: Suku / Marga Adat (SMA), (3) Pemimpin Adat / Kepala Marga (PAKM), (4) Lembaga Gereja Lokal (LGL), (5) Pemerintah Kabupaten (PK), (6) Badan Pertanahan Nasional (BPN) Bintuni (BPNB), 7: DPRD Kabupaten Teluk Bintuni (DPRDTB), 8: Lembaga Swadaya Masyarakat (LSM) lokal (LSML), 9: Komunitas Lokal / Kelompok Tani dan Nelayan (KLKTN), 10: Media Lokal (ML), 11: Pemerintah Provinsi Papua Barat (PPPB), 12:Dinas ESDM Provinsi Papua Barat (DESDMPB), 13: Dinas Kehutanan dan Lingkungan Hidup Provinsi (DKLHPB), 14: Majelis Rakyat Papua Barat (MRPB), 15: Kantor Wilayah BPN Provinsi Papua Barat (KWBPNPB), 16: Kementerian Energi dan Sumber Daya Mineral (KESDM), 17: SKK Migas (SKKM), 18: Kementerian Agraria dan Tata Ruang / BPN RI (KATRBPN), 19: Kementerian Lingkungan Hidup dan Kehutanan (KLHK), 20: Kementerian Dalam Negeri (KDN), 21: Kementerian Investasi / BKPM (KIPKPM), 22: Dewan Perwakilan Rakyat (DPR RI), 23: Komnas HAM (KHAM), 24: Mahkamah Konstitusi dan MA (MKMA), 25: Perusahaan Migas Multinasional (PMM), 26: Lembaga Keuangan Internasional (LKI), 27: NGO Internasional (NGOI), 28: Pemerintah Asal Investor (PAI), 29: United Nations Agencies (UNA)

According to Figure 3, show that this network graph (SocNetV Model3) visualizes the inter-institutional relationships and influence structure among 29 key actors involved in oil and gas investment and tenurial conflicts in Teluk Bintuni Regency, West Papua Province. The graph is a sociogram, where nodes (circles) represent institutions or stakeholder groups, and edges (lines) represent relationships, interactions, or influence flows between them.

Node colors and positions indicate the level of centrality and influence, i.e. red nodes (core) — actors with high centrality (strong influence, multiple connections). Orange and Yellow nodes — actors with moderate influence, serving as intermediaries. Green nodes — actors with limited but targeted influence, often policy-oriented or advocacy groups, and blue nodes (outer ring) — peripheral actors, with minimal or indirect roles in conflict mediation or land policy. These actors form the power core of tenurial governance and oil–gas investment decisions, i.e. Lembaga Adat (LA, 1), Suku/Marga Adat (SMA, 2), and Pemimpin Adat/Kepala Marga (PAKM, 3) → represent customary authority and local legitimacy. Pemerintah Kabupaten (PK, 5) and BPN Bintuni (BPNB, 6) → local government and land administration bodies controlling land certification and spatial planning. DPRD Kabupaten Teluk Bintuni (DPRDTB, 7) → legislative gatekeeper for regional policies. These local institutions form the main arena of conflict, linking community claims with state and corporate interests. Intermediate Influencers (Yellow–Orange Ring), i.e. These actors connect local conflicts with provincial and national policy frameworks, i.e. PPPB (11), DESDMPB (12),

DKLHPB (13) → provincial-level offices in energy, environment, and planning. MRPB (14), KWBPNPB (15) → Papua-specific institutions ensuring indigenous representation. SKK Migas (17) and KESDM (16) → national energy authorities, bridging investment management and local regulation. These actors often mediate between corporate and local interests, influencing compensation, resettlement, and land access frameworks. Outer Actors (Green–Blue Peripheral Zone), i.e. these institutions represent macro- level regulatory and advocacy structures, i.e. Kementerian (18–22) → National ministries and legislative bodies shaping land, environmental, and investment laws. KHAM (23), MKMA (24) → Human rights and constitutional oversight. PMM (25), LKI (26), NGOI (27), PAI (28), UNA (29) → international corporate and financial actors, including UN agencies and multinational oil firms, which influence funding, standards, and dispute mediation. These are global–national connectors: their influence is indirect but significant in policy framing, transparency standards, and investor accountability.

The dense cluster of central nodes shows that local and provincial institutions are deeply interconnected, indicating overlapping jurisdictions and potential for bureaucratic tension. The strong linkages to SKK Migas and KESDM highlight how energy governance is top-down, with limited local autonomy. The distance of international actors (blue/green) implies limited direct engagement but high policy leverage through national regulations and corporate partnerships.

Most tenure disputes are anchored locally, but resolved through national frameworks. Local customary groups (LA, SMA, PAKM) hold cultural legitimacy but low institutional power. BPNB and SKK Migas act as gatekeepers, controlling the flow of negotiation and decision-making. Low Peripheral Integration i.e. international and financial institutions are detached from grassroots realities, creating policy–practice gaps.

3.6 Pearson Correlation Coefficient (PCC) Matrix

This matrix captures how closely each actor's behavior, decision, or influence correlates with another across policy, investment, or conflict dimensions. The diagonal cells (greyed) show self-correlation (always 1.000). The off-diagonal cells show how institutions interact or align in terms of policy, influence, or conflict participation.

Strong positive correlations (r > 0.60) indicate close coordination or aligned interests. LA (1), SMA (2), PAKM (3), LGL (4) → Very high inter-correlation (r = 0.55–0.70), showing strong traditional–religious cooperation in handling tenure issues. PK (5), BPNB (6), DPRDTB (7) have strong correlation (r = 0.63–0.78), suggesting tight bureaucratic alignment in local governance. MRPB (14), KWBPNPB (15), DESDMPB (12) have strong link (r = 0.68–0.73), reflecting provincial coordination on land and energy policy. PMM (25), LKI (26), NGOI (27), PAI (28), and UNA (29) have high correlation (r = 0.64–0.83), indicating synergistic global or donor networks influencing local development. These groups form four strong functional clusters, i.e. customary–religious actors, local governance institutions, provincial and sectoral agencies, and international and corporate alliances.

Actor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	1.000	0.389	0.070	0.423	0.140	0.044	0.257	0.000	0.000	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.144	0.000	0.000	0.000	0.000	0.000	-0.149	0.041	-0.242	-0.388
2	0.389	1.000	0.418	0.555	-0.133	0.149	0.149	0.000	0.000	0.044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.064	0.000	0.000	0.000	0.000	0.000	-0.019	0.186	-0.304	-0.201
3	0.070	0.418	1.000	0.240	0.508	0.437	0.437	0.000	0.000	0.441	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.437	0.000	0.000	0.000	0.000	0.000	-0.331	0.751	-0.580	-0.246
4	0.423	0.555	0.240	1.000	0.140	0.044	0.044	0.000	0.000	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.144	0.000	0.000	0.000	0.000	0.000	-0.149	0.222	-0.242	-0.388
5	0.140	-0.133	0.508	0.140	1.000	0.228	0.228	0.000	0.000	0.466	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.744	0.000	0.000	0.000	0.000	0.000	-0.504	0.732	-0.243	-0.377
6	0.044	0.149	0.437	0.044	0.228	1.000	0.798	0.000	0.000	0.472	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.306	0.000	0.000	0.000	0.000	0.000	-0.208	0.472	0.082	-0.155
7	0.257	0.149	0.437	0.044	0.228	0.798	1.000	0.000	0.000	0.290	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.306	0.000	0.000	0.000	0.000	0.000	-0.208	0.472	0.082	-0.155
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.041	0.044	0.441	0.041	0.466	0.472	0.290	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.648	0.000	0.000	0.000	0.000	0.000	-0.260	0.310	0.014	-0.102
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.144	-0.064	0.437	0.144	0.744	0.306	0.306	0.000	0.000	0.648	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	-0.403	0.648	-0.164	-0.262
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	-0.149	-0.019	-0.331	-0.149	-0.504	-0.208	-0.208	0.000	0.000	-0.260	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.403	0.000	0.000	0.000	0.000	0.000	1.000	-0.441	0.347	0.444
27	0.041	0.186	0.751	0.222	0.732	0.472	0.472	0.000	0.000	0.310	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.648	0.000	0.000	0.000	0.000	0.000	-0.441	1.000	-0.186	-0.328
28	-0.242	-0.304	-0.580	-0.242	-0.243	0.082	0.082	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.164	0.000	0.000	0.000	0.000	0.000	0.347	-0.186	1.000	0.521
29	-0.388	-0.201	-0.246	-0.388	-0.377	-0.155	-0.155	0.000	0.000	-0.102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.262	0.000	0.000	0.000	0.000	0.000	0.444	-0.328	0.521	1.000

FIGURE 4. Pearson Correlation Coefficient (PCC) Matrix

Note: 1: Lembaga Adat (LA), 2: Suku / Marga Adat (SMA), (3) Pemimpin Adat / Kepala Marga (PAKM), (4) Lembaga Gereja Lokal (LGL), (5) Pemerintah Kabupaten (PK), (6) Badan Pertanahan Nasional (BPN) Bintuni (BPNB), 7: DPRD Kabupaten Teluk Bintuni (DPRDTB), 8: Lembaga Swadaya Masyarakat (LSM) lokal (LSML), 9: Komunitas Lokal / Kelompok Tani dan Nelayan (KLKTN), 10: Media Lokal (ML), 11: Pemerintah Provinsi Papua Barat (PPPB), 12:Dinas ESDM Provinsi Papua Barat (DESDMPB), 13: Dinas Kehutanan dan Lingkungan Hidup Provinsi (DKLHPB), 14: Majelis Rakyat Papua Barat (MRPB), 15: Kantor Wilayah BPN Provinsi Papua Barat (KWBPNPB), 16: Kementerian Energi dan Sumber Daya Mineral (KESDM), 17: SKK Migas (SKKM), 18: Kementerian Agraria dan Tata Ruang / BPN RI (KATRBPN), 19: Kementerian Lingkungan Hidup dan Kehutanan (KLHK), 20: Kementerian Dalam Negeri (KDN), 21: Kementerian Investasi / BKPM (KIPKPM), 22: Dewan Perwakilan Rakyat (DPR RI), 23: Komnas HAM (KHAM), 24: Mahkamah Konstitusi dan MA (MKMA), 25: Perusahaan Migas Multinasional (PMM), 26: Lembaga Keuangan Internasional (LKI), 27: NGO Internasional (NGOI), 28: Pemerintah Asal Investor (PAI), 29: United Nations Agencies (UNA)

According to Figure 4, show that moderate Positive Correlations ($r = 0.30–0.60$) reflect cooperative but uneven relationships, such as Customary actors (1–4) with local government (5–7) — linked through consultation and negotiation mechanisms. BPNB (6) and national agencies (16–18) — vertical policy coordination. Local–Provincial government (11–13) with national ministries (16–20) — moderate alignment through administrative hierarchy. This pattern suggests institutional dependency, where local decision-making often follows national frameworks rather than independent control.

Weak or Negative Correlations ($r < 0.00$ to $–0.40$) represent conflicting, misaligned, or competitive relations. Customary actors (1–3) show negative correlations with international investors (25–29), ranging –0.24 to –0.38 — a sign of distrust and differing priorities (customary land ownership vs. corporate extraction). BPNB (6) and MRPB (14) vs. PMM and LKI (25–26) — also negative (–0.15 to –0.33), showing institutional tension between local land rights and external business expansion. DPR RI (22) and provincial bodies (11–15) — slightly negative (–0.12 to –0.20), possibly due to policy fragmentation or bureaucratic competition. This illustrates the power asymmetry between local landowners and corporate/national actors, which lies at the heart of tenurial conflicts.

From this PPC matrix, we can infer a four-tier governance interaction system (Table 3). Thus, the local conflict structure emerges from misalignment between high internal cohesion (local and global clusters) and weak cross-cluster integration.

TABLE 2. Summary of Four-Tier Governance Interaction

Governance Layer	Key Actors	Correlation Character	Description
Customary Core	1-4	Strong Positive	Tight community coordination based on kinship and land rights
Local-Provincial Bureaucracy	5-15	Moderate Positive	Administative coherence but uneven enforcement
National Regulators	16-22	Mixed	Policy control but weak direct local ties
Global/Corporate Institutions	23-29	High Internal but Negative to Local	Cohesive among themselves but detached from local dynamics

According to Table 2, show that highest Central Correlation Nodes: BPNB (6), PK (5), SKKM (17), and PMM (25) → represent key mediators of both coordination and tension. Strongest Traditional Block: LA (1), SMA (2), PAKM (3), LGL (4) → cohesive and internally consistent. Most Isolated Actors: UNA (29), PAI (28) → operate independently of local and national layers, influencing indirectly through policy standards or funding mechanisms. The PPC structure reflects a network with strong internal clusters but weak inter-cluster bridges, which amplifies land tenure conflicts when investment expansion meets traditional land systems.

The PPC matrix confirms that tenurial conflict in Teluk Bintuni is not merely bilateral (company vs. community), but rather systemic—rooted in fragmented institutional relationships, i.e. high local–customary cohesion contrasts with low global–local connectivity. National regulators act as "policy intermediaries" but fail to ensure downward accountability. This leads to communication asymmetry, policy overlap, and mistrust, fueling tenure-related disputes around oil and gas projects.

Hierarchical Cluster. a Hierarchical Cluster Dendrogram that visually represents how the 29 institutions (actors) involved in the oil and gas investment and tenurial conflict system in Teluk Bintuni, West Papua are grouped according to similarity or interaction intensity (based on their pairwise correlation or proximity in the PPC Matrix you showed earlier).

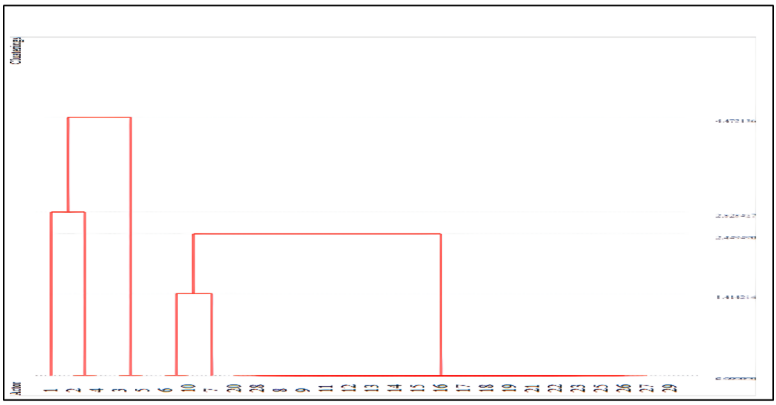

FIGURE 5. HCA for Clustering Actors

Note: 1: Lembaga Adat (LA), 2: Suku / Marga Adat (SMA), (3) Pemimpin Adat / Kepala Marga (PAKM), (4) Lembaga Gereja Lokal (LGL), (5) Pemerintah Kabupaten (PK), (6) Badan Pertanahan Nasional (BPN) Bintuni (BPNB), 7: DPRD Kabupaten Teluk Bintuni (DPRDTB), 8: Lembaga Swadaya Masyarakat (LSM) lokal (LSML), 9: Komunitas Lokal / Kelompok Tani dan Nelayan (KLKTN), 10: Media Lokal (ML), 11: Pemerintah Provinsi Papua Barat (PPPB), 12:Dinas ESDM Provinsi Papua Barat (DESDMPB), 13: Dinas Kehutanan dan Lingkungan Hidup Provinsi (DKLHPB), 14: Majelis Rakyat Papua Barat (MRPB), 15: Kantor Wilayah BPN Provinsi Papua Barat (KWBPNPB), 16: Kementerian Energi dan Sumber Daya Mineral (KESDM), 17: SKK Migas (SKKM), 18: Kementerian Agraria dan Tata Ruang / BPN RI (KATRBPN), 19: Kementerian Lingkungan Hidup dan Kehutanan (KLHK), 20: Kementerian Dalam Negeri (KDN), 21: Kementerian Investasi / BKPM (KIPKPM), 22: Dewan Perwakilan Rakyat (DPR RI), 23: Komnas HAM (KHAM), 24: Mahkamah Konstitusi dan MA (MKMA), 25: Perusahaan Migas Multinasional (PMM), 26: Lembaga Keuangan Internasional (LKI), 27: NGO Internasional (NGOI), 28: Pemerintah Asal Investor (PAI), 29: United Nations Agencies (UNA).

According to Figure 5, show that the x-axis (horizontal) lists all 29 institutional actors (from LA to UNA). The y-axis (vertical) shows the clustering distance (linkage distance) — the higher the vertical line connecting two actors or clusters, the less similar they are. Each branch (red line) represents a linkage of similarity among institutions in terms of their roles, cooperation, or influence within tenurial conflict dynamics. This analysis used Ward's or average linkage clustering, which groups actors based on how similar their relational profiles are across all pairwise correlations.

The dendrogram shows three major clusters of institutions. Cluster 1 – Customary– Community Governance Cluster (High Cohesion, Low Distance). Members of cluster are 1 (LA), 2 (SMA), 3 (PAKM), 4 (LGL), 5 (PK), 6 (BPNB), 7 (DPRDTB), 10 (ML). These actors merge at very low distances (≈ 1.4–2.8), showing tight social and operational linkages. Represent the local governance and customary authority network. Their close clustering reflects shared interests in land control, cultural legitimacy, and local mediation of disputes. Media (ML) is part of this group — indicating local narrative alignment and strong information exchange within the district level. This group forms the social-communal foundation of tenurial governance. They are first responders and primary stakeholders in land disputes arising from oil and gas projects.

Cluster 2 – Provincial–National Bureaucracy Cluster (Moderate Cohesion, Medium Distance) has members consisted of 8 (LSML), 9 (KLKTN), 11 (PPPB), 12 (DESDMPB), 13 (DKLHPB), 14 (MRPB), 15 (KWBPNPB), 16 (KESDM), 17 (SKKM), 18 (KATRBPN), 19 (KLHK), 20 (KDN), 21 (KIPKPM), 22 (DPR RI), 23 (KHAM), 24 (MKMA). Characteristics of this group consisted of merge between distances 2.5–3.5, indicating moderate similarity and bureaucratic coordination. Include provincial agencies (PPPB, DESDM, DKLHPB, MRPB) and national

ministries (KESDM, KLHK, KATRBPN, KDN). They act as regulatory and supervisory bodies that translate national investment policies into provincial implementation. KHAM (Human Rights Commission) and MKMA (Judiciary) are attached at moderate distances, suggesting episodic but influential involvement in dispute resolution. This cluster represents the policy and regulatory coordination system. They connect top-down policy frameworks with bottom- up land management—though the medium clustering distance reflects bureaucratic fragmentation [17] [18] [19] and inconsistent field implementation.

Cluster 3, i.e. Global–Corporate Network (Low Similarity to Local Actors, High Distance). The Members consisted of 25 (PMM), 26 (LKI), 27 (NGOI), 28 (PAI), 29 (UNA). Characteristics are merge at the highest distances (4.4–4.7) — very distinct from local and national actors. Represent global and transnational institutions: corporations, donors, foreign governments, and UN agencies. High internal cohesion but low integration with the first two clusters. Reflect external influence via investment capital, sustainability agendas, or human rights advocacy — but with weak direct ties to indigenous institutions. This cluster functions as a global governance and financial oversight layer, providing funding, policy pressure, and corporate responsibility frameworks, yet remains distant from local tenurial dynamics. This clustering pattern reveals a multi-scalar governance divide into three level (Table 4). This shows that institutional integration weakens as governance scales increase — meaning local actors are cohesive, national actors are bureaucratically linked, but global actors remain detached [20] [6] [10] [3] [21].

The second cluster illustrates vertical policy linkages, yet it also reveals coordination bottlenecks, particularly between provincial agencies and national ministries [12] [6] [22] [23]. Meanwhile, external influence without integration appears in the third cluster, where international and corporate actors demonstrate strong internal coherence based on shared economic interests but remain relatively isolated from grassroots structures. This separation often leads to misaligned priorities in land governance processes. The characteristics of each governance layer and cluster composition are summarized in Table 3.

TABLE 3. Level of Governance, Cluster Composition, Core Role, and Distance Pattern

Governance Layer	Cluster Composition	Core Role	Distance Pattern
Local Customary	Cluster 1 (Actors 1-10)	Social legitimacy, dispute mediation	Strongly cohesive (low distance)
Provincial-National Bureaucracy	Cluster 2 (Actors 8-24)	Policy design, regulation, and supervision	Moderately cohesive
Global-Corporate	Cluster 3 (Actors 25-29)	Capital, international compliance	Loosely connected (high distance)

Governance recommendations emphasize the need for bridging mechanisms between Cluster 1 and Cluster 3, facilitated by Cluster 2 actors (provincial and national mediators). Such mechanisms are essential to transform investment relationships into more inclusive land governance frameworks. The conflict sensitivity of each cluster is presented in Table 4.

TABLE 4. Conflict Sensitivity Based on Cluster

Cluster	Main Actors	Core Function	Integration Level	Conflict Sensitivity
1	LA, SMA, PAKM, LGL, PK, BPNB, DPRDTB, ML	Customary & local coordination	High internal integration	High
2	LSML–MKMA	Bureaucratic–policy mediation	Moderate	Medium
3	PMM, LKI, NGOI, PAI, UNA	Corporate & global institutions	Low (externally oriented)	Low but strategic

The dendrogram reveals that tenurial conflicts in Teluk Bintuni are structurally rooted in inter-cluster disconnection — a highly cohesive local network operating in isolation from globally-driven investment actors, with bureaucratic intermediaries that often fail to bridge this divide.

4 DISCUSSION

The findings reveal that tenurial conflict in Teluk Bintuni Regency reflects a deep structural imbalance between local and national actors in the governance of oil and gas investments. The quadrant mapping demonstrates that actors with the highest authority (e.g., SKK Migas, Kementerian ESDM, ATR/BPN RI) possess strong decision-making power but remain least vulnerable to the direct social and environmental impacts of resource extraction. In contrast, customary institutions (Lembaga Adat, Suku/Marga Adat, local leaders, and churches) face the highest exposure to land loss social displacement, and ecological degradation [24] [25] [26]—while holding minimal influence in policy formulation and benefit-sharing negotiations.

This imbalance highlights the persistence of asymmetric governance structures, where top-down regulatory control often overrides bottom-up customary rights recognition. Local governments and district-level agencies occupy an intermediary position, mediating between

state and community interests, yet they often lack sufficient institutional authority or fiscal capacity to enforce equitable outcomes.

The position of civil society and local media (Quadrant III) underscores their reactive and advocacy-based role. They contribute to awareness and transparency but remain peripheral in formal decision-making. Their vulnerability stems from dependence on external funding and limited access to official data, which restricts their long-term influence on conflict resolution.

Conversely, international actors and financial institutions (Quadrant IV) such as the IFC–World Bank, ADB, and UNDP wield global influence in shaping sustainability frameworks but have limited direct engagement in resolving micro-level land disputes. Their intervention remains largely normative—focused on compliance with FPIC (Free, Prior, and Informed Consent) and environmental safeguards—without addressing the local governance gaps that perpetuate conflict.

Overall, the quadrant typology reflects the fragmented coordination among multi- level institutions. Strengthening co-governance mechanisms—particularly through institutionalized FPIC procedures, participatory mapping, and transparent compensation is essential to balance power asymmetries and ensure that indigenous land rights are substantively protected amid ongoing energy investment expansion.

The network visualization demonstrates that tenurial conflict in Teluk Bintuni is shaped by a multi-level governance web, where customary authorities, local governments, and national energy institutions are most central, while international actors influence through normative and financial power. The dense connectivity in the inner core suggests high interaction but also high potential for conflict escalation, requiring integrated multi-actor coordination to prevent tenure insecurity and ensure fair benefit distribution from oil and gas investments.

5 CONCLUSION

This study demonstrates that the expansion of oil and gas investment in Teluk Bintuni Regency has created a complex web of relationships between state institutions, private corporations, and indigenous communities. While the presence of multinational oil companies has generated significant economic benefits at the national level, it has also intensified local land disputes and deepened social vulnerabilities among indigenous groups who depend on their ancestral territories for livelihood and identity.

The institutional mapping and quadrant analysis reveal clear asymmetries of power. National ministries and regulatory agencies such as ESDM, ATR/BPN, and SKK Migas occupy dominant positions in decision-making, yet they remain largely insulated from the social and ecological consequences of investment. On the other hand, local customary institutions—clans, traditional leaders, and churches—bear the heaviest burden of land dispossession and environmental change, despite being the legitimate custodians of the land. This imbalance reflects a persistent gap between the legal recognition of customary rights and their practical enforcement within Indonesia's extractive economy.

At the same time, local governments and civil society organizations play a fragile mediating role. They attempt to bridge the interests of the state and indigenous people but are often constrained by limited authority, resources, and access to information. International actors, including financial institutions and UN agencies, promote global standards such as Free, Prior, and Informed Consent (FPIC), but their engagement at the local level remains minimal and largely advisory. Ultimately, the future of Teluk Bintuni's oil and gas development depends on whether Indonesia can harmonize national economic ambitions with the moral and cultural obligations to protect the people and the land that

sustain them. Sustainable investment must therefore mean more than profit—it must mean equity, dignity, and respect for indigenous sovereignty.

To move forward, genuine co-governance between state and customary institutions is essential. Policy frameworks should not only regulate investment but also empower indigenous communities as equal partners in decision-making. Strengthening participatory land mapping, ensuring transparent compensation mechanisms, and embedding FPIC principles in every stage of project implementation are key steps toward restoring trust and social justice.

6 REFERENCES

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