

Political Economy, Power and Policy in Sustainable Agriculture in South Papua Province

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Abstract: This study examines the relationship between political power and government policy in shaping the trajectory of sustainable agriculture in South Papua, Indonesia, while evaluating the extent to which current policies support or hinder the implementation of sustainability principles. Employing a qualitative case study with a descriptive-analytical approach, the research draws on semi-structured interviews with farmers, indigenous leaders, government officials, legislators, and civil society representatives, complemented by field observations and analysis of policy documents. Data were systematically processed using thematic coding and content analysis, aided by NVivo software. Findings reveal four interrelated themes: (1) the dominance of national political-economic agendas in local agricultural governance through large-scale food estate and bioethanol projects; (2) a policy-practice gap, as national sustainability discourses often contrast with input-intensive implementation; (3) the resilience of indigenous agroecological practices such as crop diversification, shifting cultivation, and organic fertilization, which offer ecologically adaptive alternatives; and (4) structural barriers including weak infrastructure, limited technical capacity, bureaucratic fragmentation, and unresolved indigenous land tenure rights. The study concludes that sustainable agricultural development in South Papua requires policy reorientation toward bottom-up participation, recognition of customary land rights, capacity-building for smallholders, and integration of indigenous agroecological systems into national strategies.

Keywords: Political Power; Sustainable Agriculture; Indigenous Agroecology; Public Policy; Food Estate Policy; South Papua; Hinder Sustainability Principles; Political-Economic; Structural Barriers.

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1. Introduction

Sustainable agriculture currently occupies a strategic position on the global agenda of food security, rural development, and climate change adaptation. In Indonesia, this issue is increasingly relevant in the context of political decentralisation and regional autonomy, which places local governments as key actors in natural resource governance [1]. In Merauke Regency, South Papua Province, the National Strategic Project (PSN) focuses on rice and sugar cane production to support self-

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sufficiency in sugar and bioethanol [2]. Large-scale projects require the construction of supporting infrastructure, such as specialised terminals and transportation facilities, but have drawn both pros and cons, especially concerns about the seizure of customary land, deforestation, and potential social conflicts related to their social and economic impacts on indigenous communities and environmental sustainability [3]. South Papua, as a region with significant agricultural potential but plagued by limited infrastructure, socio-political dynamics, and ecological vulnerability, presents both challenges and opportunities for sustainable agricultural development. Therefore, agricultural issues are not only technical aspects of production but also closely linked to power relations, policy direction, and community access to agrarian resources [4].

While a growing body of literature addresses agrarian dynamics and sustainability in Indonesia, most studies focus on Java, Sumatra, or regions with large-scale agricultural bases. Meanwhile, research on South Papua remains relatively limited, particularly that which examines the interplay among local power, public policy, and agricultural practices. Yet, agrarian complexity presents a unique socio-political configuration: the role of local political elites, dependence on natural resources, and the continuation of traditional practices are often marginalised by formal policies [5]. This academic gap underscores the need for more in-depth research to understand the political-economic dynamics shaping the direction of sustainable agriculture in the region. The analytical framework used in this study integrates the approaches of Critical Political Economy, Political Ecology, and the Sustainable Development Framework. Political Ecology contributes to understanding inequality of access, agrarian conflict, and power relations in land management. At the same time, sustainability theory provides a normative basis for long-term ecological, social, and economic aspects [6]. By combining these approaches, the analysis can be more holistic in examining how policies and power distributions influence agricultural practices in South Papua. This approach also broadens the scope of agrarian political economy studies, which have traditionally been oriented toward national or regional contexts with distinct agrarian bases.

Based on this framework, this study aims to analyse the relationship between political power and government policies in shaping the direction of sustainable agriculture in South Papua, and to identify the extent to which existing policies support or hinder the implementation of sustainability principles. The research question is: What role do political power and government policy play in shaping the direction of sustainable agriculture in South Papua Province? To answer this question, the study employs a qualitative, descriptive-analytical approach, utilising case studies, which enables in-depth exploration of the dynamics among local agricultural actors, policies, and practices. This research's scientific contribution lies in broadening the understanding of the political economy of agriculture in South Papua, which has been underrepresented in both global and national literature. By emphasising the interplay between power, policy, and sustainability, this study offers an innovative conceptual framework for connecting political ecology with local agrarian practices. Practically, this research is expected to generate more inclusive and adaptive policy recommendations for the South Papuan context, while also providing an analytical model that can be applied to other regions with similar socio-ecological and political characteristics.

2. Literature Review

2.1. Critical Political Economy, Political Ecology, and Sustainable Development Framework

The Political Economy of Crisis approach provides a framework for analysing how the distribution of power and political interests influences agricultural policy and access to agrarian resources [7]. The concept of Political Ecology enables an evaluation of the relational order among humans, politics, and the environment in agrarian dynamics [7]. Meanwhile, the Sustainable Development Framework presents normative benchmarks that consider ecological, social, and economic aspects in sustainable agricultural development. International quantitative studies also highlight the impact of the financialization of agricultural commodities on food security, although the context is more global [9]. Various studies in Indonesia highlight the challenges and practices of sustainable agriculture related to agrifood systems and conservation in local contexts [10]. Although studies on agrifood systems and conservation exist in Indonesia, the context of South Papua, particularly regarding the dynamics of political power and sustainable agricultural policies, remains empirically understudied. Research on political ecology is available, but most studies are not specifically focused on the agricultural context. Likewise, empirical studies on the role of local politics and power structures in sustainable agricultural policies in South Papua are lacking.

This article strategically combines theories of Critical Political Economy, Political Ecology, and the Sustainable Development Framework to analyse the context of South Papua—a region with very little academic empirical research. By focusing on power relations, policy, and sustainable agriculture, this research addresses this gap. It contributes new theoretical insights to the literature on agrarian political economy and political ecology, as well as to the practice of sustainable agricultural development in marginalised areas. Research trends in political ecology and agrarian studies often combine normative narratives with analyses of structural power and environmental impacts [11]. Meanwhile, research based on qualitative methodologies, such as diverse-economy or participatory studies, is becoming increasingly popular for exploring local practices and conservation. An integrative approach that combines critical frameworks and qualitative methodologies, such as this, provides an important reference for this research.

2.2. Conceptual Synthesis as a Basis Toward Sustainable Development Framework

The conceptual architecture of this study rests on the integration of Critical Political Economy (CPE), Political Ecology (PE), and the Sustainable Development Framework (SDF). This synthesis is not merely additive but relational, situating sustainability as an arena where political, ecological, and socioeconomic forces intersect. By doing so, the study establishes a methodological foundation for a critical yet constructive evaluation of agricultural development in Southern Papua (Figure 1).

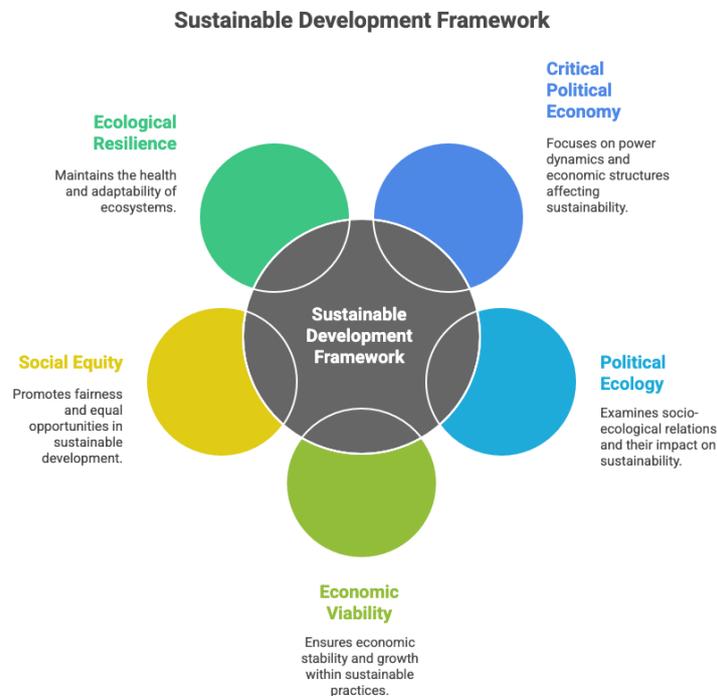


Figure 1: Conceptual synthesis

From the standpoint of Critical Political Economy, agricultural practices are understood as embedded within broader political structures and economic strategies. State policies, market mechanisms, and global capital flows decisively influence how land, labour, and resources are allocated and controlled. In contexts such as Southern Papua, where large-scale agricultural projects are closely tied to strategic state agendas, CPE underscores how policy choices reflect competing interests, institutional power asymmetries, and the historical trajectories of resource governance. This perspective foregrounds the structural determinants of inequality and the tensions between developmental ambitions and local livelihoods. Complementing this structural lens, Political Ecology brings into focus the complex interactions between ecological processes, cultural practices, and political authority. PE emphasises that agricultural development is not merely technical or economic but also ecological and cultural, shaped by competing claims over land use, differing value systems, and the socio-environmental consequences of resource exploitation. In Southern Papua, the ecological vulnerability of wetlands and forests, coupled with indigenous knowledge systems and community stewardship traditions, reveals the contradictions between large-scale agribusiness models and locally embedded sustainable practices. Political Ecology thus situates sustainability challenges within contested terrains of meaning, identity, and ecological justice.

The Sustainable Development Framework provides the normative core of this synthesis. As an integrative paradigm, it aligns economic viability, ecological resilience, and social equity as coequal pillars of agricultural transformation [12]. The SDF enables evaluative judgment, asking whether agricultural policies and practices achieve productivity while safeguarding ecosystems and empowering marginalised communities. It transforms the insights from CPE and PE into actionable criteria, providing a structured basis for assessing trade-offs, synergies, and long-term trajectories of agricultural sustainability. Importantly, it bridges global agendas—such as the Sustainable Development Goals—with local realities, ensuring that development pathways are both contextually grounded and globally relevant. By weaving together CPE, PE, and SDF, the study constructs a multi-layered analytical synthesis. Critical Political Economy contributes a structural critique by exposing how power and capital configure agricultural landscapes. Political Ecology enriches this by appreciating ecological dynamics, cultural plurality, and contested land relations. The Sustainable Development Framework consolidates these insights into a normative evaluative tool, operationalising sustainability as a multidimensional goal encompassing the economic, social, and

ecological dimensions. This synthesis not only advances methodological rigour but also provides a conceptual roadmap for envisioning inclusive, resilient, and just agricultural futures in Southern Papua.

3. Research Methods

This research employs a qualitative case study strategy with a descriptive-analytical approach to examine sustainable agricultural practices in several districts in South Papua. The choice of the case study method is based on the consideration that this strategy allows for the exploration of complex phenomena in a holistic empirical context and provides an adequate analytical framework for linking the dynamics of political power, public policy, and local community agrarian practices [13]. The data used included both primary and secondary sources. Primary data were obtained through semi-structured interviews with local farmers, traditional leaders, agricultural service officials, members of the regional parliament (DPRD), and representatives of civil society organisations/NGOs. Field observations of agricultural practices in local communities supplemented this data. Secondary data included regional policy documents, agricultural statistical reports, official government documents, and academic literature relevant to the study of political economy, sustainable agriculture, and political ecology.

Data collection was conducted through three main techniques, namely: (1) semi-structured interviews designed to explore the experiences, knowledge, and perceptions of key actors; (2) field observations to gain a contextual understanding of agricultural practices in social and ecological dimensions; and (3) document studies focused on the analysis of regulations and sustainable agriculture programs. The application of these three techniques in combination was intended to establish methodological triangulation, thereby enhancing the credibility and validity of the research findings [14]. The inclusion criteria included participants directly involved in agrarian practices (indigenous farmers) or in policymaking (local government officials, members of the Regional People's Representative Council, or NGO representatives), as well as documents published within the last five years relevant to agricultural policy in South Papua. Exclusion criteria included informants who were no longer actively involved in agrarian activities and documents that were outdated and irrelevant to sustainable agriculture issues.

The unit of analysis of this research is sustainable agricultural practices. In contrast, the research subjects include indigenous farmers, agricultural service officials, DPRD members, and civil society organisation actors who are directly involved in agrarian governance. Data analysis was conducted using a thematic analysis approach, encompassing coding, identifying key themes, and critical reflection on the researcher's position within the research process. Data validity was strengthened through triangulation across data dimensions, methods, and theories by comparing information from interviews, observations, and document analysis [15]. Document analysis employed a qualitative content analysis approach to interpret policy frameworks and their conceptual relevance. To support the systematisation of data processing, NVivo qualitative analysis software was utilised; although manual analysis was still possible, it was accompanied by a structured code categorisation procedure.

4. Research Result

The results of this study are presented based on the analysis of field data through interviews, observations, and policy documents, which were analysed thematically. The coding process resulted in four main themes, namely: (1) the dynamics of political power in agricultural governance, (2) the direction of agricultural policy and development priorities, (3) local practices of sustainable agriculture among indigenous communities, and (4) structural challenges in policy implementation.

4.1. Dynamics of Political Power in Agricultural Governance

Research findings on local power dynamics in agricultural governance in South Papua cannot be separated from national political and economic interests. Through Coordinating Minister for Economic Affairs Regulation Number 8 of 2023 and Presidential Regulation 20/2023, the Merauke region has been officially included in the list of National Strategic Projects (PSN) for food and energy development. The central government, through the Minister of Investment/Head of the Investment Coordinating Board (BKPM), as Chair of the Task Force, is pushing to accelerate a massive sugarcane plantation project covering 2 million hectares, aiming to achieve sugar self-sufficiency and bioethanol production of 1.2 million kiloliters. From a Critical Political Economy (CPE) perspective, this policy illustrates how national power structures permeate the local realm, integrating political interests, large capital, and development strategies focused on import substitution and the industrialisation of renewable energy. In this context, power relations are not only monopolised by local elites. Still, they are also determined by the state's macro-structural agenda, thus reinforcing patterns of inequality in the distribution of agrarian resources.

From a Political Ecology (PE) perspective, the introduction of national-scale projects in South Papua has significant implications for local socio-ecological relations. The allocation of 2 million hectares of sugarcane land, far exceeding the initial target of 700,000 hectares, represents a massive expansion that could alter land use, the identity of indigenous communities, and ecological justice. The central government's narrative of sustainable development, which promotes sugar and bioethanol self-sufficiency, often clashes with local practices better adapted to local ecology and community needs. This indicates that

agricultural projects in South Papua are not merely technical and local issues, but also part of a contested arena between national interests and socio-ecological sustainability. Thus, the integration of CPE and PE demonstrates that the food-energy project in Merauke is a concrete example of how national agendas intertwine with local power practices, creating new layers of complexity in agricultural governance and sustainable development.

4.2. South Papua Agricultural Policy Direction in the Context of National Strategic Projects and Food Estates

Analysis of policy documents reveals that the agricultural development plan in South Papua is focused on supporting a megaproject designated as part of the National Strategic Projects (PSN). The food estate project in Merauke, covering approximately 2.29 million hectares—70 times the size of Jakarta—includes a program to create rice and sugarcane fields and to construct sugar and bioethanol factories. This scheme aligns with Presidential Regulation (Perpres) Number 109 of 2020, concerning the Third Amendment to Presidential Regulation Number 3 of 2016, which pertains to the Acceleration of the Implementation of National Strategic Projects. It is reinforced by Presidential Regulation Number 20 of 2023, concerning the Acceleration of National Sugar Self-Sufficiency and Bioethanol Provision. Furthermore, this policy is underpinned by Coordinating Minister for Economic Affairs Regulation Number 8 of 2023, which reinstates the food and energy development project in Merauke as a PSN, with the Minister of Investment/BKPM as Chair of the Implementing Task Force. This regulation provides political legitimacy and legal certainty for accelerating land allocation and project implementation in South Papua.

This research found a fundamental gap between the strategic design of national regulations and program implementation on the ground. Although planning documents emphasise the principles of sustainable agriculture, implementation is still dominated by an intensification approach based on external inputs, such as chemical fertilisers, high-yielding seeds, and the distribution of agricultural tools and machinery (alsintan). Observational data show that most agricultural machinery assistance has not been optimally utilised due to farmers' limited technical capacity, as reported [16], regarding the low effectiveness of mechanisation programs. This situation indicates that policies emphasise large-scale production logic in pursuit of national interests rather than strengthening local capacity. Furthermore, food estates have the potential to exacerbate ecological and social vulnerabilities, as the allocation of large tracts of land can marginalise indigenous communities and lead to ecosystem degradation. Thus, although the National Strategic Projects (PSN) and the national regulatory framework are designed to strengthen food and energy security, South Papua's agricultural policy faces a significant dilemma between achieving national targets, ecological sustainability, and social justice at the local level.

4.3. Local Practices of Sustainable Agriculture of Indigenous Peoples

The results of field observations in South Papua show that indigenous people still practice traditional agricultural systems based on shifting cultivation with long rotations, the use of natural organic fertilisers, and the integration of local food crops such as sago, cassava, banana, and corn. This system embodies sustainable agroecological principles, particularly in soil conservation, water quality maintenance, and biodiversity promotion. Local knowledge passed down through customary practices has proven crucial to community food security, especially in areas with limited access to modern external inputs. Interviews with traditional leaders confirmed that this practice is not only ecologically valuable but also has strong social and cultural dimensions, maintaining community cohesion while preserving spiritual connections with the land and forest. Previous studies have demonstrated that similar local agroecological systems significantly contribute to maintaining biodiversity, enhancing food security, and offering a viable alternative to modern agricultural models that often risk environmental degradation [17].

This aligns with the findings, which emphasise that integrating local knowledge into sustainable agricultural policies is a prerequisite for achieving inclusive and adaptive development in response to climate change. These field findings also demonstrate an epistemic gap between top-down policies (such as food estates within the National Strategic Project) and the local practices of indigenous communities. While national policies encourage large-scale land intensification through mechanisation and external inputs, indigenous communities demonstrate that approaches grounded in local wisdom are better suited to Papua's ecology and more resilient to long-term socio-ecological risks. This finding is consistent with studies that show food estate projects in various regions of Indonesia are more likely to fail when they overlook local socio-ecological conditions [18].

The findings of this study indicate significant opportunities for sustainably developing local commodities, including sago, cocoa, coffee, nutmeg, and seaweed. Unlike the food estate approach, which tends toward monoculture, diversification of local commodities aligns with the findings of Izzati et al. [1] that locally based agroecological systems can increase biodiversity while strengthening food security. Furthermore, empowering indigenous communities in plantation management has the potential to create fairer and more equitable economic benefits, as emphasised by Friedland et al. [18], who argued that local community involvement is a crucial factor in ensuring the sustainability of development policies. Another potential opportunity is the development of agroecological tourism, where traditional agricultural practices can be introduced to the wider community while supporting the local economy, in line with the research by Marks and Miller [5] on the socio-ecological functions of

sustainable agriculture. With community-based management, the opportunity to increase the incomes of indigenous communities becomes more evident, as demonstrated by Tjilen et al. [2], who found that integrating local economies into agricultural development can strengthen social resistance to structural injustices in large-scale projects.

4.4. Structural Challenges in Policy Implementation

In addition to development opportunities and the potential of local indigenous practices, this study also found significant structural challenges in implementing agricultural development policies in South Papua. First, limited basic infrastructure, such as roads, transportation, and storage facilities for harvests, is a major obstacle. Many farming villages remain difficult to reach, increasing distribution costs and reducing the competitiveness of local products. This limited access forces farmers to rely on local mediators, ultimately strengthening the bargaining position of smallholders in the agricultural value chain. This condition aligns with the findings of Adiyadnya et al. [12], who suggest that weak infrastructure and market connectivity exacerbate the vulnerability of small farmers in eastern Indonesia.

Second, farmers' low technical capacity to operate modern agricultural technologies, such as agricultural machinery, often results in government assistance programs being underutilised. The lack of technical assistance exacerbates this situation, resulting in government investment in agricultural mechanisation having little impact. This is consistent with Izzati et al. [1] analysis, which indicates the low effectiveness of mechanisation programs is due to gaps in human resource capacity at the local level. Third, this study also identified a lack of coordination between government agencies. Although a regulatory framework emphasises the importance of sustainable agriculture, implementation is often hampered by bureaucracy, overlapping authority, and weak monitoring mechanisms. This phenomenon highlights a gap between normative policies and reality on the ground, as noted by Tjilen et al. [2], suggesting that weak governance in the agrarian sector exacerbates rural development disparities in Indonesia.

Fourth, there are serious challenges related to customary land rights of indigenous communities. Indigenous communities' retention of their land ownership often clashes with state agendas, particularly in strategic national megaprojects, such as the food estate in Merauke. For indigenous communities, land is not only an economic asset but also has social, cultural, and spiritual dimensions that are passed down from one generation to the next. Agrarian conflicts arise when customary rights are not fully recognised in development planning, as widely reported in critical studies of agrarian projects in Papua. Field findings indicate that indigenous communities often feel marginalised in decision-making, leading to resistance to large-scale agricultural projects perceived as ignoring their rights and identity. This situation aligns with the criticism by Adiyadnya et al. [12] that the food estate project in Papua has the potential to exacerbate the ecological crisis and violate human rights.

Furthermore, structural challenges are also influenced by reliance on short-term projects closely linked to political cycles. Many agricultural programs are implemented solely to meet short-term political targets, with no guarantee of sustainability. Field respondents confirmed that aid programs often cease after changes in officials or regional heads. This finding aligns with Pakidi et al. [4] study on political patronage in Indonesia, which demonstrates that the allocation of village development resources is often driven by short-term, pragmatic orientations rather than a vision for sustainable development. Thus, these structural challenges emphasise that the success of agricultural development in South Papua is largely determined not only by infrastructure, technical capacity, and formal institutions, but also by the extent to which state policies can respect and integrate customary land rights within the framework of sustainable development.

5. Discussion

The findings of this study demonstrate that agricultural development in South Papua occurs within a complex arena of interactions among national political-economic interests, indigenous communities' local practices, and structural challenges that hinder policy implementation. This discussion outlines four main points of synthesis: (1) state and large capital intervention in agrarian governance, (2) the dilemma of national policy versus local context, (3) the role of local wisdom as the basis for sustainable agroecology, and (4) the politics of recognising customary land rights as a prerequisite for development justice.

5.1. State Intervention and Big Capital in Agrarian Governance

The research confirms that the national strategic projects (PSN) in Merauke, particularly the development of two million hectares of sugarcane, demonstrate the dominance of the state and large capital in agrarian governance. A Critical Political Economy (CPE) perspective helps explain how this policy is not merely about food and energy security, but also part of the state's strategy to integrate Papua into the national industrialisation project. This aligns with Marks and Miller's [5] analysis of accumulation by dispossession, in which indigenous peoples' lands are restructured to support capital accumulation. In South Papua, the national power structure narrows the space for local autonomy, relegating regional elites to mere policy intermediaries. Thus, agricultural governance in South Papua is not merely a technical issue, but also a form of articulation of

state power and global capital, mediated through legal instruments such as Presidential Regulation 20/2023 and Coordinating Ministerial Regulation 8/2023.

5.2. Dilemmas of National Policy versus Local Context

The food estate policy in South Papua emphasises large-scale production with a national orientation, but fails to adapt to local socio-ecological conditions. This discrepancy is reflected in farmers' minimal utilisation of agricultural machinery assistance due to limited technical capacity, as well as in indigenous communities' resistance to large-scale land allocations. As Nost and Goldstein [7] note, the misalignment between technocratic development logic and local realities often results in policy failure in the agrarian sector. This dilemma also highlights an epistemic tension: while national policies prioritise a modernisation approach to agriculture based on external inputs, indigenous communities continue to maintain more adaptive, traditional agroecological systems. This contradiction highlights the need for a hybrid approach that is not only focused on national targets but also grounded in local contexts and community capacities.

5.3. Local Wisdoms as the Basis for Sustainable Agroecology

The traditional agricultural practices of the indigenous people of South Papua have been shown to incorporate agroecological principles that support sustainability, such as crop diversification, field rotation, and soil conservation. This approach fundamentally differs from the monoculture food estate model, which tends to be homogenous and vulnerable to ecological degradation. Anugrah and Hestina [8] emphasise that local agroecological systems not only enhance food security but also strengthen ecosystem resilience to climate change. Within the framework of Political Ecology (PE), this practice should be seen as a strategy of community resistance against state and capital domination. By maintaining local ecologically based farming traditions, indigenous communities not only protect the environment but also assert their identity and sovereignty over the land. This opens up opportunities to utilise local agroecology as a basis for alternative economic development, including agroecological tourism and strengthening local commodity value chains.

5.4. Politics of Recognising Customary Land Rights

One of the most crucial findings is the challenge of indigenous peoples' retention of customary land rights. For indigenous Papuans, land is not merely an economic commodity but also the basis of social, cultural, and spiritual existence. When customary rights are sidelined in food estate projects, the result is not just an agrarian conflict but also a crisis of community identity and sustainability. Anugrah and Hestina [8] assert that the marginalisation of indigenous peoples' rights is a direct consequence of a top-down agrarian development model. Therefore, sustainable agricultural development in South Papua cannot be separated from the politics of recognition. The state must ensure the implementation of Law Number 21 of 2001 concerning Special Autonomy for Papua, which normatively recognises and respects customary rights. Without robust recognition and protection mechanisms, national strategic projects risk exacerbating structural injustices, fueling resistance, and thwarting long-term development goals [18].

5.5. Theoretical and Practical Implications

The integration of CPE and PE analyses in this study demonstrates that agricultural development in South Papua is not merely an economic arena, but also a complex political-ecological arena marked by conflict and negotiation. Theoretically, this emphasises the need to view agricultural development not merely as a policy domain, but as a contested arena where power relations, capital interests, and local practices interact. The following table displays the findings, implications and recommendations of the research as follows (Table 1).

Table 1: Research findings, implications, and recommendations

Research Findings	Implications	Recommendations
National Strategic Projects (PSN) such as food estate programs in South Papua prioritise large-scale monoculture (sugarcane, rice fields, bioethanol) with strong state–capital intervention.	Indicates political–economic power dynamics dominate over local autonomy, shaping agricultural direction toward national industrial goals rather than local sustainability	Reorient agricultural policy to integrate local agroecological practices; ensure bottom-up participation in planning to balance state interests with community needs.
The gap between strategic planning (sustainable agriculture rhetoric) and field implementation remains input-intensive and technocratic.	Reveals contradictions between policy discourse and practice, creating risks of policy failure and unsustainable outcomes	Strengthen monitoring and evaluation systems to align implementation with sustainability principles, and adopt hybrid

		approaches that combine modern technology with traditional knowledge.
Limited utilisation of agricultural machinery (alsintan) due to low farmer technical capacity	Indicates that technical assistance is insufficient and that input distribution alone does not foster local resilience.	Provide long-term farmer training, capacity building, and extension services; prioritise human capital development over short-term input distribution.
Structural challenges: poor infrastructure, limited market access, weak inter-agency coordination	Farmers remain dependent on mediators, characterised by low bargaining power and high transaction costs, which perpetuates rural inequality.	Invest in rural infrastructure (roads, storage, market facilities); enhance institutional coordination and inclusive market linkages.
Land tenure conflicts: Indigenous peoples' customary land rights are often sidelined in PSN allocation.	Marginalisation of indigenous rights risks triggering social resistance, land disputes, and undermining the legitimacy of policy implementation	Enforce recognition of indigenous land rights (UU Special Autonomy for Papua); institutionalise Free, Prior, and Informed Consent (FPIC) in agricultural development projects.
Reliance on short-term, politically driven projects influenced by electoral cycles	Long-term sustainability is compromised; development programs risk discontinuity and misallocation of resources.	Establish independent, multi-stakeholder governance bodies to safeguard long-term planning, insulated from electoral politics
Indigenous agroecological practices (crop diversification, shifting cultivation, soil conservation) remain resilient and sustainable.	Provides alternative models for climate resilience and local food security, challenging state-led monoculture paradigms	Integrate indigenous agroecological systems into regional policy, supporting community-based agroforestry, eco-tourism, and the development of value-added local commodities.

In practice, this research emphasises the urgency of reorienting national agricultural policies to be more responsive to local contexts and firmly rooted in the agroecological systems of indigenous communities. Such reorientation must be accompanied by the recognition and protection of customary land rights, which should serve as the very foundation for sustainable development in Papua. Beyond policy reform, there is also a need to strengthen the technical capacity of indigenous communities—not merely through the distribution of agricultural inputs, but via long-term mentoring programs that combine modern technology with local wisdom. At the same time, diversification of the local economy based on agroecological principles is crucial, as it not only enhances food security but also provides an alternative to overreliance on large-scale projects, which are often vulnerable to failure. The findings of this study underscore that sustainable agricultural development in South Papua can only be realised if the state, indigenous communities, and other local actors build equal, collaborative relationships, respect the sovereignty of customary land, and integrate local knowledge into the broader national policy framework (Figure 2).

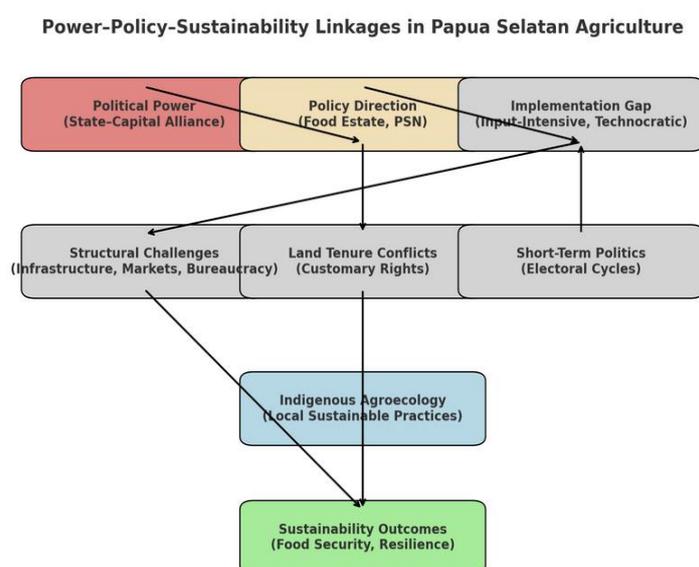


Figure 2: Infographic maps power policy sustainability linkages

6. Conclusion

This research indicates that the direction of agricultural development policies and priorities in South Papua remains heavily influenced by the configuration of political power at both the local and national levels. At the regional level, the distribution of authority between provinces and districts is often not based solely on technical evidence but rather driven by political alliances and patronage practices. This has implications for unequal access to agricultural resources, such as fertilisers, seeds, and agricultural machinery, thereby reinforcing socioeconomic inequalities among farmers. At the national level, the inclusion of national strategic projects (PSN) such as the food estate program and large-scale sugarcane plantations in Merauke demonstrates the country's priority of pursuing food and energy security. However, there is a gap between the vision of sustainable development outlined in policy documents and on-the-ground implementation practices, which are still predominantly oriented towards externally driven intensification.

Structural challenges, including limited infrastructure, weak inter-agency coordination, and low technical capacity among farmers, exacerbate this situation. Furthermore, the issue of customary land rights remains a fundamental problem, with indigenous communities feeling marginalised from access to productive land allocated for large-scale projects. On the other hand, research findings confirm that sustainable agricultural practices based on the local wisdom of indigenous communities—such as long-swimming field rotation, the use of natural organic fertilisers, and the integration of local food crops—offer an alternative model that is more adaptive to Papua's ecological conditions. These practices not only contribute to soil and water conservation but also strengthen indigenous communities' food security independently. Therefore, the direction of agricultural policy in South Papua needs to consider the synergy between national policies and local practices, so that ecological sustainability, social justice, and food sovereignty can be achieved in a balanced manner.

As a follow-up to the research findings, the government should integrate indigenous communities' local knowledge into agricultural policies, ensuring that development is not merely top-down but also rooted in agroecological practices proven to maintain ecological sustainability. Reforming customary land governance is crucial, strengthening the recognition and protection of community rights through clear legal mechanisms so that national strategic megaprojects do not compromise community access to livelihoods. Furthermore, assistance programs such as those providing agricultural machinery and inputs must be balanced with ongoing technical training, farmer capacity building, and the development of adequate distribution infrastructure. Agricultural policies also need to shift from a short-term, project-based orientation to long-term planning consistent with the principles of ecological sustainability and food security. Therefore, cross-level coordination between the central government, regional governments, and indigenous communities must be strengthened to avoid overlapping policies and ensure synchronisation between the national development vision and local needs.

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Ethics and Consent Statement: This investigation was carried out in accordance with established ethical protocols. Informed consent was obtained from all participants, and robust measures were taken to ensure the confidentiality and protection of participant information.

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