Forest and Society
Vol. 9(2): 422-448, December 2025
10.24259/fs.v9i2.40301

REGULAR RESEARCH ARTICLE

Conflict and Compromise, Discourse and Action: Political Ecology in the Complexity of Land Management in Central Kalimantan, Indonesia

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RECEIVED 2024-09-25
ACCEPTED 2025-01-23

ABSTRACT

Peatlands in Mantangai District, Central Kalimantan, have emerged as a site of contention among many stakeholders with differing interests, illustrating the intricacies of natural resource management in Indonesia. This research seeks to examine the contestation process, identify main actors, and comprehend how various forms of knowledge and power influence the results of peatland management. This research employs a case study method with a qualitative approach, incorporating direct observation, in-depth interviews, and document analysis to achieve a thorough knowledge of the dynamics of contestation. The findings indicate three primary viewpoints in peatland management: eco-conservationism exemplified by Mawas Borneo Orangutan Survival Foundation (BOSF), eco-developmentalism illustrated by the government's food estate initiative and oil palm plantation expansion, and eco-populism promoted by Wahana Lingkungan Hidup (WALHI) Central Kalimantan and local communities. This contention leads to multiple underlying conflicts, including tensions between conservation initiatives and resource extraction activities by local communities, discrepancies between governmental development programs and the ecological and social realities, as well as unresolved land disputes and compensation challenges arising from the expansion of oil palm plantations. This study suggests that a more holistic and inclusive approach to peatland management is necessary, taking into account ecological, economic, and socio-cultural factors in a balanced manner. These findings significantly enhance the comprehension of the intricacies of natural resource management and can underpin the formulation of more inclusive and sustainable policies moving forward.

KEYWORDS

Political ecology; Ecological contestation; Conservation program; Food estate; Oil palm plantations.

1. INTRODUCTION

Peatlands are intricate socio-ecological systems essential for global carbon sequestration, hydrological management, climate mitigation, and biodiversity preservation (Page et al., 2011; Rawlins & Morris, 2010). Their management holds strategic significance for multiple reasons. First, peatlands sequester significant quantities of carbon, accounting for around 30% of global soil carbon while occupying merely 3% of the Earth's terrestrial surface (Page et al., 2011; Warren et al., 2017). Second, peat ecosystems offer essential environmental services, including water control, flood and drought mitigation, and habitat for indigenous flora and fauna (Harrison et al., 2020; Reed et al., 2014). Third, the peatlands influence the customs, behaviors, and livelihoods of communities that develop over time (Carmenta et al., 2021; Reed et al., 2014).

The interest of diverse stakeholders in peatlands is intrinsically linked to their distinctive attributes as strategic resources that encompass ecological, economic, and socio-cultural aspects (Bryant & Bailey, 1997; Purnomo et al., 2017a). The substantial

economic potential of peatland conversion for agriculture and plantations draws interest from the business sector and government development initiatives (Goldstein, 2016; Marwanto & Pangestu, 2021). Conversely, its essential ecological role in climate change mitigation renders it a focal point for environmental organizations and the international community (Murdiyarso et al., 2019; Warren et al., 2017). Local communities' reliance on peatlands for their livelihoods and cultural identity renders them essential stakeholders (Carmenta et al., 2021; Reed et al., 2014).

The socio-ecological framework of Mantangai District, situated in Kapuas Regency, Central Kalimantan, illustrates the intricacies of peatland management in Indonesia. Since the initiation of the Mega Rice Project (MRP) in 1995, this area has experienced a succession of external interventions. This ambitious initiative converted 1.4 million hectares of peat forest into a national rice granary, signifying a pivotal moment in the region's developmental history.

In Mantangai District, three predominant methods of peatland management exist, each embodying distinct visions and ideals. The conservation movement seeks to restore the equilibrium of peat ecosystems and safeguard indigenous species. The food estate program aims to convert peatlands into extensive food production hubs to enhance national food security. The growth of oil palm plantations, motivated by global market dynamics, converts peat landscapes into lucrative agricultural fields.

Peatland management in Indonesia has evolved into a contentious arena with many stakeholders and expertise, which results in complex disputes (Goldstein, 2016; Homer-Dixon, 1999; Hoyt et al., 2020; Purnomo et al., 2017; Thornton et al., 2018; Uda et al., 2017). These disputes encompass multiple stakeholders, including central and municipal governments, business enterprises, local communities, and non-governmental organizations, each possessing distinct goals and interpretations regarding the management of peatlands (Bryant & Bailey, 1997; Purnomo et al., 2017). The interplay among conservation, food security, and economic growth exemplifies the intricacies of natural resource management and underscores the challenges of sustainable development in the Anthropocene epoch (Murdiyarso et al., 2019; Warren et al., 2017). Every management approach carries significant and frequently conflicting consequences for local communities, resulting in a landscape of disputed interpretations and practices in peatland use (Carmenta et al., 2021; Reed et al., 2014).

Political ecology provides an extensive conceptual framework for comprehending this conflict. Political ecology perceives peatland management as a multifaceted issue that encompasses not only technical and scientific considerations but also power dynamics, socio-cultural interactions, knowledge construction, and economic factors (Bryant, 2015; Forsyth, 2003; Gallemore et al., 2015; Neumann, 2005; Peet & Watts, 2004; Rodríguez-Labajos & Martínez-Alier, 2015). Fundamental ideas in political ecology, including access to and control over natural resources, elucidate how power dynamics and structural inequalities affect the utilization and management of peatlands. The political ecology framework facilitates a comprehensive examination of the impact of various interests and power dynamics on environmental management policies and practices (Bryant, 2015; Peet & Watts, 2004; Robbins, 2011).

Within the framework of political ecology, the access to and governance of land and natural resources emerge as essential themes that illustrate societal power dynamics (Ribot & Peluso, 2003; Sikor & Lund, 2009). Access is characterized as the capacity to utilize resources, influenced not only by formal ownership but also by diverse methods, processes, and social interactions that enable actors to acquire, control, and sustain such access (Ribot & Peluso, 2003). In Central Kalimantan, peatland disputes involve intricate discussions among traditional rights, governmental policies, and corporate interests, frequently leading to disparities in resource access and control (Larson &

Soto, 2008; McCarthy & Robinson, 2016). This disparity takes place through the marginalization of local populations via decision-making processes and the limitations imposed on their access to traditionally maintained areas. Peatland management involves the contestation of knowledge, wherein scientific insights, governmental policies, and indigenous wisdom intersect and occasionally conflict in shaping management methods (Dove, 2006; Fairhead & Leach, 2003; Li, 2007). A political ecology framework facilitates a critical examination of prevailing narratives regarding environmental degradation, uncovering the influence of power and specific interests on environmental discourse and policy (Forsyth, 2003; Peet et al., 2011; Robbins, 2011).

Peatland management encompasses three primary views that embody distinct values and methodologies. First, eco-conservationism prioritizes the safeguarding of ecosystems (Adams & Hutton, 2007; Wittmer & Birner, 2005); Second, eco-populism promotes the rights and expertise of local communities (Guha & Martinez-Alier, 2006; Martinez-Alier, 2002; Wittmer & Birner, 2005). Third, eco-development aims to reconcile economic advancement with environmental sustainability (Escobar, 1998; Robbins, 2011; Wittmer & Birner, 2005). These disparities frequently lead to peatland management regulations that contradict local behaviors and knowledge (Ece et al., 2017; Scott, 1998; Tolinggi et al., 2023).

This political ecology study gains enhancement from an environmental ethics viewpoint that offers a moral basis for comprehending and assessing power dynamics in peatland management. Environmental ethics enhances the structural analysis of political ecology and elucidates the moral aspects of conflicting interests and divergent viewpoints among stakeholders (Martin et al., 2013; Proctor, 1998). An environmental ethics framework elucidates how moral ideals and principles shape the interpretation and management of natural resources by various stakeholders, thereby impacting power dynamics in peatland management. Within political ecology, environmental ethics elucidates the ethical concerns underlying conflicts of interest and divergent management strategies among different stakeholders (Jax et al., 2013; Nygren & Rikoon, 2008).

Environmental ethics provides significant opportunities for inquiry regarding human interactions with nature, the inherent worth of ecosystems, and moral responsibilities toward the environment (Kopnina et al., 2018; Leopold, 1945; Naess, 1973; Taylor, 2011). These inquiries remain essential in political ecology analysis as they elucidate the ethical motivations and rationalizations that underpin the conduct of diverse stakeholders in peatland management disputes. This viewpoint enhances peatland management discussions by incorporating ethical considerations in decision-making and the enduring effects of different management options on ecosystem vitality and future generations (Rolston, 1989).

Prior studies demonstrate the intricacies associated with peatland management. Conservation efforts incite confrontations between local communities and external entities in the peatlands, when peatland rehabilitation strategies affect the lives of local populations (Jewitt et al., 2014; Thorburn & Kull, 2015). Expansion driven by economic growth incites conflict and alters the socio-ecological landscape (Escobar, 2008; Harvey, 2001), while governmental initiatives aimed at enhancing food security in peatlands complicate the discourse (Marwanto & Pangestu, 2021; Runtuboi et al., 2020)

Current research indicates a deficiency in our comprehension of how conflicts between external and local players directly affect peatland management practices and policies at the local level. This study aims to address this deficiency by analyzing multi-level contestation dynamics in Mantangai District. This study employs political ecology

and environmental ethics frameworks to facilitate a thorough comprehension of the interplay between different types of knowledge and power in peatland management. This project seeks to enhance the literature on political ecology and environmental sociology while offering valuable insights for policymakers and development practitioners engaged in peatland regions.

2. MATERIAL AND METHODS

This study was performed in two villages: Mantangai Hulu Village and Kalumpang Village, located in Mantangai District of Kapuas Regency, Central Kalimantan Province. These communities were chosen for their lowland landscape features, including peat swamp habitat and watershed regions. Furthermore, they encompassed diverse peatland management objectives: conservation, agricultural estates, and oil palm cultivation. The research site is depicted in Figure-1.

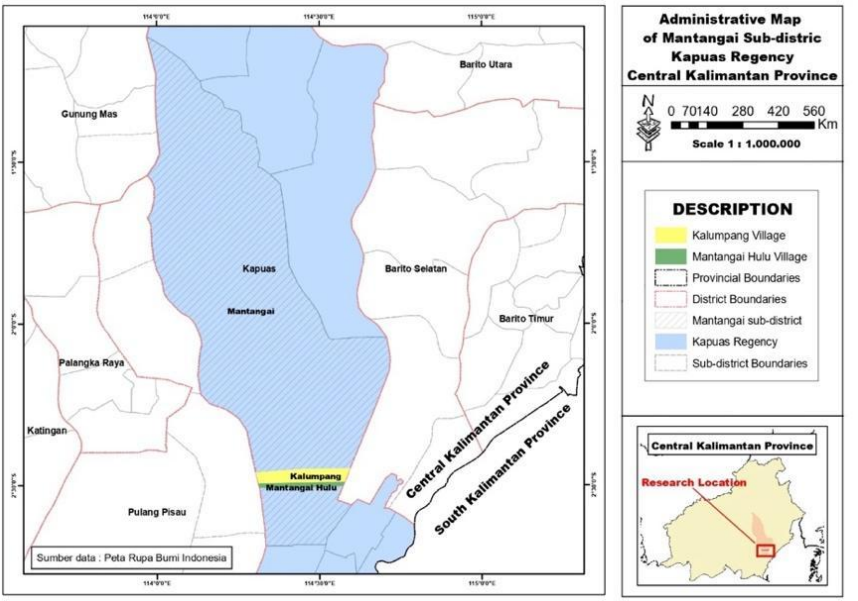

Figure 1. Administrative map of the research location

This research utilized a qualitative methodology with case study techniques to investigate intricate contexts and gain profound understanding of the dynamics of Mantangai Hulu and Kalumpang Villages. Data collection was executed using participant observation, non-participant observation, in-depth interviews, and document analysis to achieve a more thorough comprehension of the research issues (Creswell, 2013; Yin, 2011). In participant observation, the researcher actively participated in community activities, including weaving rattan and purun polybags, managing tree nurseries, and collecting rubber trees, among others. Simultaneously, non-participant observation was undertaken to assess the status of forests and peatlands controlled by the community, activities within oil palm plantations, and social interactions.

Comprehensive interviews were conducted with 26 informants, including local community people, representatives from government agencies, NGO personnel, and staff from oil palm companies (informant information in Table-1). Face-to-face interviews were conducted, spanning 40 to 90 minutes, with certain informants interviewed many times for more comprehensive insights. This study examined a range

of papers and archives, including food estate master plans, agricultural reports from Mantangai District, participation statements in the food estate initiative, investigative reports from many environmental NGOs, and governmental policy documents.

Table 1. Description of research informants

No. Informant Code	M/F	Age	Background
IM01	M	-	BOSF Mawas Staff
IM02	M	55	Farmer
IM03	M	48	Kalumpang Village Head
IM04	M	-	Agriculture Office Staff
IM05	M	-	Agriculture Office Staff
IM06	M	54	Farmer, forest wood gatherer, rubber farmer
IM07	F	24	Housewife
IM08	M	59	Farmer, shop owner
IM09	M	-	Traditional leader (*Mantir Adat*), farmer
IM10	M	54	Farmer, forest wood gatherer
IM11	M	-	WALHI Central Kalimantan member
IM12	M	-	WALHI Central Kalimantan member
IM13	M	-	Save Our Borneo (SOB) member
IM14	M	55	Rattan craftsperson
IM15	F	51	Farmer, palm oil worker
IM16	F	54	Farmer
IM17	M	55	Farmer
IM18	F	-	Food Security Office Staff
IM19	F	51	Farmer, rattan craftsperson
IM20	F	48	Farmer, rattan craftsperson
IM21	F	47	Kindergarten teacher, farmer
IM22	F	51	Farmer, rattan craftsperson
IM23	F	-	Agriculture Office Staff
IM24	F	-	BOSF Mawas Staff
IM25	M	-	Traditional Chief (*Damang*)
IM26	M	-	PT. Kalimantan Lestari Mandiri (KLM)

Data management followed the stages delineated by Creswell (2013). The initial phase involved the meticulous examination of field notes to identify pertinent patterns aligned with the research objectives. At this stage, we identified patterns of peatland degradation causes originating from the MRP program, which engaged external entities to undertake activities in existing ex-MRP sites. The second stage entailed coding and thematic organizing, pinpointing keywords, phrases, or significant concepts within the data. The themes were systematically categorized according to their pertinence to the study issues. The third stage entailed the representation of data to derive interpretations from informant assertions.

3. BACKGROUND: SOCIO-ECOLOGICAL TRANSFORMATION OF MANTANGAI DISTRICT

The Mantangai District encompasses 38 settlements across an area of 6,128 km². Mantangai Hulu Village encompasses 33,199.80 hectares and comprises five neighborhood units, while Kalumpang Village spans 14,149.85 hectares and consists of six neighborhood units. The predominant demographic is the Dayak Ngaju, who utilize their indigenous language in everyday communication. The community adheres to diverse ideologies, including Christianity, Islam, and *Kaharingan* (Hindu).

Mantangai District, situated 5 meters above sea level, is a lowland region adjacent to rivers and wetlands, distinguished by extensive peatlands. Prior to 1995, this region had a peat forest abundant in biodiversity, featuring Ramin (*Gonystylus bancanus*),

Jelutung (*Dyera costulata*), and several small-stemmed trees. The region also contained fauna such as orangutans, bears, and wild boars.

The alteration of Mantangai's terrain began with the Indonesian Government's MRP in 1995. The initiative, launched by President Soeharto's administration, aimed to transform 1.4 million hectares of peat forest into agricultural land. The development of the project's drainage and canal system adversely affected the peat swamp ecosystem and heightened its susceptibility to fires. In late 1997, a pivotal moment occurred as catastrophic fires ravaged the peat region, resulting in extensive smoke calamity and ecological destruction.

Prior to the MRP involvement, local communities had established intricate land management systems grounded in indigenous knowledge. The regions were categorized into three primary zones: *Kaleka* (settlement and intensive agriculture), *Sepang* (hunting and forest collecting), and *Tajahan*/ *Pukung Pahewan* (holy forest). In *Tajahan*, communities permitted the use of non-timber forest products and traditional hunting for subsistence purposes. Commercial operations, firearm hunting, and extensive agriculture were explicitly forbidden. In *Pukung Pahewan*, regarded as the abode of ancestral spirits, only ancient ceremonies and pilgrimages are permitted, characterized by *pasah taluh* (ritual dwellings) and sacred sawang trees (*Pangium edule*).

The community's economy formerly depended on forestry but shifted following the enforcement of unlawful logging regulations in 2005. They transitioned to agriculture and rubber cultivation. Agriculture, particularly rice cultivation, faced challenges after MRP's collapse in the late 1990s. Law Number 32/2009 regarding environmental protection and Central Kalimantan Regional Regulation Number 1/2020 concerning land fire management have further distanced populations from agriculture.

The Mantangai communities practiced shifting cultivation for generations, employing swidden techniques on three-year cycles. Prior to the 2009 burning prohibition, each household cultivated 2-3 hectares, yielding 2-3 tons of rice every season in addition to other crops. They employed conventional ditches, 1-2 meters in width, arranged in grids for fire management and fishing. The *tugal* method was employed for rice cultivation using traditional implements, while the *handep hapakat* social structure comprised 10-15 families engaged in cooperative labor groups.

The loss of shifting agricultural access has adversely affected familial food security. Current income sources include swiftlet nesting, retail operations, oil palm plantation labor, gold mining, rattan craftsmanship, gemor bark (*Alseodaphne sp*), and wages from Mawas BOSF reforestation efforts.

The Presidential Decree No. 80/1999 officially revoked MRP. Following the MRP initiative, three competing land management models emerged: conservation initiatives spearheaded by Mawas BOSF since 2002, overseeing 309,000 hectares; the expansion of oil palm plantations, notably PT. KLM 5,000-hectare concession established in 2014; and the food estate program launched in 2020.

Initially, Mantangai Hulu and Kalumpang villages were excluded from designated food estate areas. Nevertheless, following the submission of recommendations by farmer groups during the socialization process, both settlements were classified as food estate regions, despite their exclusion from the program's initial grand plan.

4. RESULTS

Our research elucidated the intricacies of peatland management in Mantangai District, encompassing multiple stakeholders with divergent interests. Three principal approaches represented distinct perspectives and ambitions.

4.1 Preservation zone

The MRP in Mantangai District experienced significant transformation following the Indonesian Government's project initiation in 1995. Originally designated for 1 million hectares, the area was increased to 1.4 million hectares to establish a national rice granary aimed at enhancing food security. The top-down strategy, which overlooked peatland ecological traits, resulted in significant ecosystem devastation.

Damage to the ecosystem mostly stemmed from inadequate irrigation canal systems. The canals, intended for peatland water management, resulted in excessive drainage, disregarding the hydrological needs of peatlands that require continuous saturation. This resulted in peat subsidence and diminished water retention capacity, rendering peatlands susceptible to dry-season fires and potentially releasing significant carbon emissions.

In response to adverse effects, the Indonesian Government published Presidential Decree No. 80/1999, formally terminating MRP and requiring hydrological restoration. Nonetheless, repair initiatives were impeded by ambiguous managerial directives. The government originally allocated 500,000 hectares for conservation, which was subsequently reduced to 309,000 hectares under Presidential Instruction No. 2/2007. This reduction involved reclassifying certain regions as Other Use Areas (OUA), thereby permitting diverse land uses, including oil palm plantations.

Since 2002, Mawas BOSF, based in Bogor, has overseen the conservation area. Chosen for their vast experience in orangutan conservation since 1991, they executed a comprehensive conservation strategy emphasizing peat ecosystem restoration and the protection of orangutan habitats.

The Mawas BOSF conservation strategy encompassed the safeguarding of peatlands and orangutans. Peatlands function as natural sponges that manage water systems and mitigate fire hazards, while orangutans serve as umbrella species that facilitate seed dissemination and vegetation restoration.

> *"What is the rationale for safeguarding orangutans? Initially, they are classified as an umbrella species. They are the most effective reforesters; the territory of one female orangutan spans 10 kilometers. Consumption of fruit results in seed dispersal via defecation, facilitating the spontaneous growth of new plants."* (Interview IM01, April 24, 2024)

In response to significant ecological degradation, Mawas BOSF implemented adaptive reforestation utilizing purun (*Eleocharis dulcis*) polybags, prioritizing environmental sustainability through biodegradable materials and improved seedling growth. Since 2021, this effort has fostered synergy between conservation and local economic empowerment.

> *"What is the purpose of utilizing purun? Our environmental emphasis requires the avoidance of plastic polybags. It is non-polluting, generates no waste, and transforms into compost. Purun endures for 6-7 months prior to planting, subsequently transforming into fertilizer. Although plastic polybags are still utilized in certain contexts, numerous environmentally sustainable alternatives are also available."* (Interview IM24, April 24, 2024)

Purun (*Eleocharis dulcis*), an indigenous wetland species suited to peat habitats, has cylindrical stems that reach a height of 1.5 meters and a diameter of 0.5-1 cm. The Dayak Ngaju traditionally utilize purun for mats, baskets, and crafts, exemplifying the blending of indigenous knowledge with conservation technology while generating economic opportunities.

Participatory reforestation began in 2024 in Mantangai Hulu Village, located 2.9 kilometers from the Mawas BOSF office. Nine working groups, with 5-7 families each, generated 1,000 polybags containing local tree seedlings such as belangiran (*Shorea balangeran*) and jelutung. Production entailed gathering purun 5-7 km from towns, followed by drying, pounding, and weaving it into polybags. Mawas BOSF allocated Rp. 2,500 for each seedling via group treasurers.

The reforestation initiative encompassed extensive economic diversification, including savings and loans for village women, amplang production, organic vegetable growing, and local aquaculture. Mawas BOSF offered consistent oversight and technical instruction.

Mawas BOSF established strategic multi-level partnerships to enhance conservation: international funding from the Dutch Gibbon Foundation; formal collaboration with five governmental agencies, namely Protection Forest Management Unit (PFMU), Production Forest Management Unit (PFMU), Environmental Agency (DA), Forest Management Unit (FMU), and State Electricity Company (SEC); sophisticated forest monitoring through partnerships with NASA and Macron; and fire monitoring collaboration with Australian research institutions. In 2021, Mawas BOSF collaborated with prominent palm oil firms PT. Sawit Sumbermas Sarana and PT. BCL to create a 104-hectare orangutan rehabilitation center in Pulau Salat and to formulate Best Management Practices for sustainable land management.

Mawas BOSF collaborated with Kalimantan Forests and Climate Partnership (KFCP) in Mantangai to generate grid maps for conservation areas. Kalumpang locals criticized three aspects: the restoration procedures that involved cutting down large trees for new seedlings, the lack of transparency in carbon monitoring, and the inadequate financial incentives compared to rubber tapping income.

> *"We have possessed these grids since KFCP. During KFCP, we utilized LIDAR data to analyze the contours of the Mawas work area."* (Interview IM01, April 24, 2024)

> *"We were pleased when KFCP initially arrived, as we lacked understanding, and they provided us with financial assistance..." Activities included sitting allowances. Consequently, it was recently deliberated in the community that, in the absence of sitting allowances, we would choose to engage in rubber tapping."* (Interview IM21, May 1, 2024)

> *"KFCP initiative involved forest replanting; however, they felled substantial trees to cultivate diminutive seedlings akin to straws. Why not preserve existing elements and cultivate where necessary? Conversely, they felled the larger specimens."* (Interview IM16, May 1, 2024)

The presence of BOSF in Mantangai District limited traditional wood gatherers via field posts and patrols. Certain community members transitioned to clandestine harvesting of gemor bark and minor logging operations. Although criminal behaviors were frequently recorded, the enforcement of laws was not regularly executed. Nonetheless, previous encounters with forest police apprehensions and timber devastation continued to shape community conduct.

> *"We are not particularly fearful of them. However, they may capture our images; it is uncertain whether we will be reported subsequently. They do not prohibit cutting if it occurs outside their jurisdiction... We previously transported timber downstream, and they captured images of it... When we executed it clandestinely, we were apprehended. However, it appears that no reports were made. Previously, a team emerged unexpectedly, which was our concern. The crew was comprised of police officers entering the forest. An individual was apprehended while adrift on*

timber. They processed the wood by sawing, chopping, and cutting it." (Interview IM19, April 22, 2024)

Mawas BOSF asserted that they did not possess the jurisdiction to penalize local communities engaged in logging activities. They recognized that their regular forestry activity reports were frequently followed by the Directorate of Special Criminal Investigation (DSCI) as infraction reports. Per their Memorandum of Understanding with the Provincial Government, law enforcement responsibility was vested in the Directorate General of Environmental and Forestry Law Enforcement (DG EFL). Mawas BOSF strategic field posts assessed forest conditions and documented timber levels, providing quarterly reports to the provincial government. They favored a persuasive strategy that involved debate and education regarding deforestation effects.

The administration of the 309,000-hectare protected area employed a three-tier zoning system developed through collaborative processes, categorizing regions into usage, buffer, and core zones. The designation of core zones involved traditional leaders and community delegates. These zones encompassed peat regions above 8 meters in depth, exhibiting dome subsidence and elevating fire risk.

The predominant indigenous community in Mantangai District is the Dayak Ngaju, possessing particular traditional knowledge and land allocation methods. In the Dayak Ngaju language, peat ecosystems are referred to as *petak sahep*, indicating a profound comprehension of land attributes. They understand the variations in thickness and their applications, with dense peat regions retaining water, offering fish habitats during dry seasons, and facilitating natural purun and rattan growth.

The traditional zoning system of the Dayak Ngaju exemplifies a conflict of knowledge with contemporary methodologies. BOSF zoning categorizes regions based on protection levels, while local communities employ a more intricate system that incorporates socio-cultural values, delineating territories into *Kaleka*, *Sepang*, and *Tajahan/ Pukung Pahewan* zones.

Fundamental differences exist in management philosophies. In *Tajahan* regions, communities enforce restricted use rules that permit the extraction of non-timber forest products and traditional subsistence hunting, while explicitly banning commercial activity, modern weaponry, and extensive cultivation. Access to *Pukung Pahewan*, thought to be the abode of ancestral spirits, remains limited to traditional rites and pilgrimages, characterized by ritual huts and sacred sawang trees. This stands in opposition to contemporary scientific and technological zoning methodologies that frequently neglect spiritual aspects and indigenous knowledge in conservation efforts.

4.2 Food estate zone

The food estate program underscored the conflict between indigenous knowledge and contemporary methods in the management of peatlands in Mantangai. Conventional agriculture produced 2-3 tons of rice per hectare from 2-3 hectares per family, facilitated by local practices such as multifunctional ditches and the *handep hapakat* social institution for collective labor organization. Law No. 32/2009 and the 2020 food estate initiative mandated a shift to permanent agriculture utilizing contemporary equipment that was ill-suited for peatland conditions. As a result, Mantangai's rice production decreased from 22,945 tons in 2016 to 2,373.8 tons in 2023.

In 2020, the Indonesian Government initiated the food estate program to improve food security and optimize land management. The initiative sought to establish cohesive, contemporary, and sustainable food production facilities. This aimed to address food and nutrition consumption requirements, enhance national food reserves, promote farmer welfare, and facilitate the construction of the new capital city. Actions to attain these objectives encompassed: (1) Enhancing productivity, production

efficiency, and value addition through the fortification of technological innovation and the optimization of production chains and marketing of precision agriculture-derived food items and agricultural cooperatives. (2) Enhancing the wellbeing of agricultural business stakeholders by establishing integrated upstream-downstream food production centers. (3) Rehabilitating and conserving forest and peat habitats to provide sustainable food production hubs, coupled with spatial planning and regional infrastructure systems.

The food estate initiative entailed collaboration across multiple institutions, overseen by the Ministry of Agriculture. The Kapuas District Agriculture Office was essential in facilitating survey, investigation, and design (SID) efforts, as well as in aiding farmer groups within their designated regions. Palangka Raya University was engaged in the design of food estate mapping, with cooperation from the Public Works and Spatial Planning Office (PW SPO). The Indonesian government partnered with contractors and the military to ensure effective land management implementation.

In Mantangai Hulu Village, the agricultural estate initiative effectively cleared 216 hectares in 2021. Participating farmers were mandated to sign documents affirming dispute-free land status, forbidding land alteration or sales, and relinquishing compensation for existing vegetation. Despite the government's provision of agricultural lime, rice seeds, insecticides, and subsidized fertilizers, the distribution of aid encountered delays relative to the scheduled planting timelines.

> *"The content of the food estate declaration indicated our agreement to forgo compensation for any existing vegetation, as I recall."* (Interview IM08, April 25, 2024)

> *"It specified no permanent crops or plantations for five years following the implementation of the food estate, no land conversion, and no sales."* (Interview IM23, June 5, 2024)

> *"Production inputs needed to be delivered prior to land clearing, ensuring that once the ground was cleared, the inputs would be available for instant planting by farmers. When land was cleared but inputs were unavailable, farmers became demotivated due to the absence of seeds. There were also recent delays."* (Interview IM23, June 5, 2024)

Resistance arose from IM15's family in Mantangai Hulu, whose land was within the program zone yet was never included in socialization meetings. Dissatisfaction escalated as their land continued to be cleared, despite the owner's refusal to endorse the proclamation.

The food estate program in Kalumpang Village encountered many problems. The program progressed only to the socialization and mapping phases, as the community divided into two factions: proponents anticipating economic enhancement and opponents opposing it owing to pre-existing stipulations. The rejection primarily addressed three significant issues: the ban on land conversion without compensation for crop failure, the absence of compensation for productive rubber trees that were to be felled, and the ambiguity regarding program status within the Agriculture Office framework. Nevertheless, the community continued to seek additional clarification and decisions concerning the future of the food estate program, as there had been no substantial progress since the area mapping.

The food estate program encountered both community opposition and significant execution obstacles. A primary problem lay in the disparity between local community knowledge on traditional rice farming techniques and the approaches implemented in the food estate initiative. Communities were typically familiar with shifting agriculture,

which involved planting mountain rice varieties that necessitated traditional techniques such as land burning, dibbling, and harvesting with minimal care. Furthermore, communities were deficient in understanding contemporary agricultural technology and the meticulous cultivation of premium rice types. They possessed greater familiarity with conventional agricultural practices and exhibited limited knowledge with systems necessitating significant technical involvement.

Communities had to address new agricultural practices advocated by the Indonesian Government. Food estates implemented established agricultural systems featuring paddy fields that necessitated rigorous management, including seed preparation, soil upkeep, and pest control. This necessitated modifications in community competencies, including the acquisition of new procedures such as seedling transplantation, fertilizer and pesticide application, and methods for drying and storing harvested produce. The process of adaptation of knowledge engendered reluctance among certain farmers to embrace new methodologies, particularly if they encountered failures or challenges. A setback in one season led to diminished motivation and hesitance to attempt again.

The food estate encountered structural issues that impeded its efficacy and success. Initially, there was a discrepancy in spatial planning, as irrigation channels and farm roads did not conform to the original blueprints. Secondly, constructed drainage systems were inadequate for managing changes in water levels, particularly in regions influenced by river tides. A minimum distance of 500 meters from riverbanks should have been observed to mitigate flooding; however, inadequate site selection exacerbated this issue. Third, the execution of programs without comprehensive field surveys, frequently depending on imprecise satellite data or maps, resulted in inaccuracies in land allocation and processing. The choice to clear dense peatland without regard for site features demonstrated planning inadequacies. Fifth, delays in the distribution of agricultural production inputs, such as seeds and fertilizers, hindered planting and diminished farmer morale and output.

This complexity was exacerbated by inadequate inter-institutional coordination. Agricultural extension professionals knowledgeable about regional conditions and their associated farmer groups were not fully engaged. Program administrators depended exclusively on data and maps from farmer groups, without collaborating with agricultural extension professionals. Ultimately, the farmer group data utilized by the food estate team failed to synchronize with the extension worker databases, leading to inaccuracies in land processing and misallocation of aid to unintended recipients. This scenario incited horizontal conflicts, encompassing disputes over help.

The food estate initiative also elicited community apprehensions over resource and finance constraints. Communities perceived themselves as incapable of competing with huge corporations potentially engaged in food estates and were concerned that unsuccessful food estate land would be neglected or sold off. This might advantage firms with substantial equipment and capital access, which were seen to excel in land management and facilitate the removal of communal land rights.

The local community's skepticism over the program intensified upon examining the food estate development patterns in relation to MRP history. The graphic illustrated the locations of food estates in former MRP zones that were unsuccessful in 1999, some of which were now designated as palm oil concessions.

Notwithstanding numerous hurdles and apprehensions, the local residents in Mantangai Hulu Village sustained optimism for the continuance of the food estate initiative. They sought policies that were not mere promises but were effectively executed. Their experience indicated that following the acquisition of land, they lacked sufficient instruction on land management, particularly regarding appropriate

fertilization methods. Communities wanted government support to encompass not only legislation and assistance but also tangible training and direction evident in the field.

Local communities anticipated enhancements in the food estate program they deemed imprudent. Their ambitions encompassed the establishment of adequate irrigation infrastructure and the liberty for crop diversification to enhance profitability. They aspired to restore food self-sufficiency and transmit sustainable agricultural practices to future generations.

> *"Would you oppose the continuation of food estate operations? I would be more content and amenable if it could be revisited. Avoid exhibiting such recklessness that lacks community advantage. It must be effectively administered. Proper management of irrigation water necessitates the repair of secondary canals and the construction of block canals. Thus, individuals can compete, continue their employment, and refrain from relocating. I would have a greater sense of pride... As parents, our sole aspiration is the future of our children and grandchildren."* (Interview IM08, April 25, 2024)

4.3 Palm oil plantation area

The old MRP region in Mantangai District underwent a transformation from its original use as agricultural land for food production. Despite the Indonesian Government's construction of fundamental infrastructure such as canals and garden blocks from 1995 to 1998, actual conditions in the field revealed significant discrepancies. WALHI Central Kalimantan disclosed that the former MRP area had been transformed into oil palm plantations, undermining governmental initiatives to rehabilitate degraded agricultural land.

Numerous oil palm plantation enterprises possessed concessions in Mantangai District. PT. KLM, a subsidiary of the Chinese Julong Group, obtained a 5,000-hectare concession in 2014. As of 2024, PT. KLM had cleared approximately 1,900 hectares, comprising 1,400 hectares planted with oil palm and 500 hectares cleared but unplanted. The remaining 3,100 hectares were still being planned.

PT. KLM's expansion encountered opposition from three groups comprising 10-17 households in Mantangai Hulu Village. This rejection originated from the past trauma of land acquisition by PT. Usaha Handalan Perkasa (UHP) in 2012, resulting in the loss of customary agriculture without sufficient compensation. Local populations likewise rejected becoming laborers on their own land, resulting in land occupation and the removal of oil palm plantings.

PT. KLM's land acquisition in Kalumpang Village encountered difficulty when the company sought a 50x16 meter truck access route through profitable rubber plantations. Although the initial land compensation was set at Rp. 2 million per hectare, the proposed Rp. 5,000 per square meter for transportation corridors, excluding compensation for agricultural value, was declined.

> *"Rp. 5000 per meter adjacent to the roadway. However, our land with rubber trees was not reimbursed for vegetation... around 200-300 rubber and durian trees without remuneration."* (Interview IM17, May 1, 2024)

> *"The compensation of Rp. 1,300,000 for a 50x16 meter plot was inadequate. Selling land with rubber trees resulted in the loss of our garden and property; hence, we were committed to defending our land."* (Interview IM16, May 1, 2024)

Complicated circumstances emerged in Mantangai Hulu Village as a result of land mafia activities in conjunction with officials. Land mafias asserted claims derived from ancestral legitimacy endorsed by authorities such as regional governments, village

councils, or traditional institutions. This involved the alteration of maps from the paklaring era, indicating ownership rights of 500-1000 hectares and counterfeit land certificates utilizing the names of deceased individuals, leading to overlapping claims and disputes.

PT. KLM had compensation challenges in Mantangai Hulu owing to overlapping claims. A group of 12 households received Rp 1.5 million per hectare in land compensation and requested an additional Rp 35,000 for each productive rubber tree and Rp 27,000 for each juvenile rubber tree; however, two groups comprising around 27 households had not received any compensation despite land clearance activities.

Local communities encounter obstacles to judicial justice. The mediation supported by the Kapuas District Government encountered delays due to: (1) PT. KLM's assertion of compensation payments to third parties asserting land title, and (2) changes in the directorship of PT. KLM complicating the tracking of transaction documentation. In April 2024, PT. KLM proposed a goodwill payment initiative in response to the standoff, facilitated by local authorities. The initial proposal was set at Rp 35 million per group, which was subsequently raised to Rp 45 million following direct negotiations; nonetheless, it was declined as individual allocations would amount to just Rp 1.8-2 million, significantly less than their incurred losses.

The local residents' resistance to PT. KLM's compensation proposals signified a profound aspiration to preserve their land rights and agricultural practices. They required the restoration of land to its former state, particularly their rubber plantations. The community acknowledged that companies could not entirely substitute current plantations due to the extended maturation period of rubber trees.

> *"I am not rejecting; I simply will not accept 3 million or any offered amount. Even at 35 million per individual, I still decline. What is the reason? I should request that they restore the plants that were previously present. I request the return of the plants. Since they cannot revert those plants to rubber trees, they are unable to restore the plants I cultivated to their full size. Is it possible for the corporation to cultivate rubber trees that yield instant production? How many additional years must I wait if I begin on a small scale?"* (Interview IN06, June 2, 2024)

The presence of oil palm enterprises incited conflicts and adversely affected the environment and the daily lives of communities. The development of oil palm necessitated significant alterations to ecosystems, particularly in the peatland areas. It commenced with forest conversion, resulting in the loss of natural habitats and the disruption of ecosystems. Organizations frequently constructed permanent canal systems to regulate water flow in peatlands. This management was essential since oil palm necessitated somewhat arid soil conditions. The canal system sought to diminish water levels in peatlands for oil palm cultivation, although it further harmed peat ecosystems and degraded soil quality.

Oil palm plantations provided dual effects. Ecologically, the construction of embankments, the utilization of pumps, and the application of chemicals polluted local water sources. Socio-economically, inequitable land acquisition via below-market transactions or land mafia activities had constrained the living space of local populations, which encountered limits in economic resources, knowledge, and legal access.

Significant income disparities between large corporations and communities exacerbated perceptions of injustice. Communities experienced pressure while striving for revenue, in stark contrast to the significant profits amassed by huge corporations on their property.

Moreover, recurrent peatland fires generated discussions over accountability. Communities challenged assumptions that attributed blame to shifting cultivators, emphasizing that they had ceased such practices for years. Displaced farmers frequently served as scapegoats, overlooking persistent fires, like those on PT. KLM land that ignited nearly every year. This imbalance has resulted in community discontent and a near erosion of trust in national regulations and legislation.

4.4 Community advocacy

Save Our Borneo (SOB) elucidated that the MRP region, initially a peat forest with indigenous vegetation, possessed nutrient-deficient yet hydrological attributes. This natural condition rendered intact peatland inappropriate for traditional cultivation.

> *"Peat is inherently low-quality terrain, lacking nutrients even in optimal conditions, and renders cultivation unfeasible when left undisturbed. When peat remains intact, it is moist, saturated, and inundated."* (Interview IM13, April 18, 2024)

Prior to the prohibition of land burning, local communities had established sustainable peat management techniques. They categorized their environment into two types: (1) dense peat for fishing and galam wood harvesting, (2) shallow peat under one meter in depth for agriculture. Communities controlled peat habitats for rice agriculture as well as for diverse alternative food sources.

WALHI Central Kalimantan condemned the food estate initiative as a reiteration of previous errors. The program had difficulties stemming from seed incompatibility with local conditions and site selection on dense peatland.

> *"There exists a geographical division. Some individuals believe they are cultivating dense peat, however this is inaccurate. Certain sites possess peat that is less than one meter in depth. That area is cultivated derived from their expertise. Thick peat serves just for fishing and the collection of galam wood. They assert the existence of their own geographical division, indicating that agriculture is prohibited on dense peat, as rice cannot thrive in such conditions. The dense peat currently utilized for agricultural estates was solely employed by the population for fishing and harvesting galam wood. IM02 indicates that the peatland designated for the food estate is comprised of very dense protected peat, as proven by the discovery of an excavator becoming submerged in the peat during land clearance operations. This signifies dense peat, which explains why communities refrained from utilizing that region for cultivation. Post-implementation, expectations significantly diminished due to inappropriate seed varieties and imported seeds intended to benefit suppliers, which ultimately proved incompatible and failed."* (Interview IM12, April 19, 2024)

This scenario exemplified the disparity between indigenous expertise in peat ecosystem management and the governmental programmatic approach. Local populations had historically comprehended the attributes of their land and established suitable management systems, whereas the food estate program encountered difficulties in adapting agricultural practices to dense peatland.

In addition to agricultural development initiatives, palm oil plantations had compromised the environment and adjacent people. WALHI Central Kalimantan asserted that forests must stay preserved and not be converted into palm oil plantations. Palm oil corporations had transformed thousands of hectares of land, and their land acquisition methods were dubious, with allegations of tactics such as purchasing land at undervalued rates or engaging with land mafias. Local populations, constrained by limited economic resources, expertise, and legal access, had no alternative but to acquiesce when confronted by enterprises possessing substantial

resources and political affiliations.

SOB asserted that rehabilitation was unnecessary for Mawas BOSF protection as long as natural habitats remained intact. They perceived deforestation as the fundamental issue prompting orangutans to encroach upon residential zones or community plantations. SOB prioritized forest preservation over the conservation of specific species. SOB and WALHI Central Kalimantan attributed environmental degradation chiefly to government policies and licensing practices.

> *"The predominant damage resulted from the government's implementation of food security initiatives during President Suharto's administration. A peat development project named MRP encompassed one million hectares. In these unsuccessful MRP regions, the peat is compromised."* (Interview IM13, April 18, 2024)

> *"If inquired about the primary culprit for environmental degradation, the government is to blame. They create policies, issue permits, and provide further documentation. What is the purpose of a food estate? What is the purpose of companies? Government-backed programs, such as food estates and corporate land expansion, are seen as key contributors to environmental degradation. The government possesses numerous transgressions."* (Interview IM12, April 19, 2024)

In reaction to this circumstance, WALHI Central Kalimantan advocated for environmental preservation using a pragmatic methodology. While recognizing that existing environmental problems might be irreparable, they stressed the importance of averting more harm to the surviving regions. They emphasized preservation and harm mitigation, acknowledging that total restoration might be challenging.

WALHI Central Kalimantan supported the Agrarian Reform Object Land (AROL) initiative, governed by Presidential Regulation No. 86/2018. This program allocated land via four sources: expired cultivation rights, abandoned land, state land, and forest release. A major difficulty was the restricted public access to AROL information, especially with cultivation rights and their expiration dates. The cultivation rights data in Central Kalimantan was obsolete and insufficient.

> *"AROL's difficulty is restricted public accessibility. Information openness is a challenge, as AROL typically originates from expired or abandoned cultivation rights, however this information remains undisclosed by the pertinent ministries. In Central Kalimantan, there is only obsolete data regarding 1.3 plantations. We are unaware of which ones have two or three years remaining. In the AROL scheme, awareness of cultivation rights and their expiration dates is essential, as extensions necessitate consent from adjacent communities prior to the issuance of licenses."* (Interview IM11, April 19, 2024)

WALHI Central Kalimantan advocated Social Forestry (SF) as a fundamental technique to provide community access to area management. Their notion of community-managed territories encompassed rights related to authority, production, and consumption. SF was regarded as a gateway to actualize these rights, in conjunction with other agrarian reform measures. They systematically consolidated communities to utilize social forestry, with the objective of safeguarding communal habitats recognized by current government regulations.

The SF policy, as reported by WALHI Central Kalimantan, originated from civil society's advocacy in reaction to environmental degradation resulting from disparities in the governance and management of natural resources. Consequently, they perceived SF as a tactical measure for altering environmental allocation and management. Nonetheless, they acknowledged the limitations of SF, especially with licenses that were valid for just 35 years and might be assessed or rescinded at any moment,

potentially restricting community access to area governance.

Not all villages in Mantangai District possessed forests suitable for management as SF. Consequently, they advocated for the inhabitants of Kalumpang and Mantangai Hulu villages to revert to traditional agricultural methods based on their indigenous knowledge. WALHI Central Kalimantan asserted that traditional agricultural methods and indigenous knowledge had demonstrated efficacy in environmental conservation. This stood in stark contrast to government food security initiatives, which were deemed unsuccessful. Indigenous knowledge, encompassing pamali (a system of traditional environmental prohibitions) principles and traditional law, was seen as a crucial element in environmental preservation.

WALHI Central Kalimantan partnered with the Legal Aid Institute (LAI) in these advocacy initiatives. A significant difficulty was the legal classification of land removal by burning as a criminal offense. They endeavored to educate communities and government entities that Dayak agricultural methods did not precipitate extensive forest and land conflagrations.

WALHI Central Kalimantan engaged with Solidaritas Perempuan Mamut Menteng and Pantau Gambut to empower rattan artisans in Kalumpang Village. This initiative sought to link rattan artisans with prospective investors. This primary objective was to identify investors prepared to finance sustainable and eco-friendly business endeavors. They organize meetings between rattan artisans and investors to explore collaboration opportunities and identify markets for rattan items. This choice of rattan crafting activity was predicated on its beneficial effects on forest and environmental conservation in the region.

WALHI Central Kalimantan asserted that the persistence of rattan weaving endeavors would enable people to sustain their community rattan gardens. A significant factor in selecting rattan as a commodity was its inherent trait of being unable to thrive independently, necessitating symbiosis with other flora, such as huge trees. This attribute aided in preserving land cover and conditions, particularly in peat regions, without inflicting harm. They perceived this as an economic activity that did not adversely affect the environment, which was the objective they aimed to advance through this empowerment program.

5. DISCUSSION

The management of peatlands in Mantangai District, Central Kalimantan, served as a compelling case study illustrating how political ecology frameworks elucidated the intricate relationships among conservation, development, and local lives. Utilizing Robbins (2011) theory on degradation and marginalization, this instance illustrated how environmental management practices frequently established cycles that perpetuated socio-ecological disparities.

5.1 Contestation from a political ecology perspective

Three primary approaches—eco-conservationism, eco-developmentalism, and eco-populism—were apparent in this contestation, mirroring Wittmer & Birner (2005) conclusions regarding varied views in natural resource management. The dispute in Mantangai District illustrated conflicts among prevailing environmental management discourses.

Mawas BOSF's conservation strategy exemplified what Igoe et al. (2008) refers to as fortress conservation, a protective concept frequently leading to social exclusion, notwithstanding attempts at community involvement. Mawas BOSF embodied the eco-conservationism approach, emphasizing the preservation of peat ecosystems and orangutan habitats (Adams & Hutton, 2007). Their strategy focused on prioritizing ecosystems and critical species preservation indicated a transition from species-centric

to ecosystem-centric conservation, in accordance with global conservation practice trends (Soulé, 1985).

The food estate program exemplified what Scott (1998) described as a high modernist concept in environmental management. Furthermore, according to Ferguson's (1990) view, the failure of this program exemplified the operation of the anti-politics machine, which simplified intricate political-economic problems and translated them into technological remedies. It embodied an eco-developmentalism paradigm, striving to reconcile economic advancement with environmental sustainability (Escobar, 1998). Nonetheless, its execution frequently overlooked ecological considerations, bolstering critiques of top-down development strategies that typically disregarded local contexts (Scott, 1998). This methodology, as critiqued by Li (2007), frequently neglected indigenous perspectives and knowledge systems built over generations.

WALHI's campaign exemplified Martinez-Alier (2002) environmentalism of the poor, integrating environmental issues with social justice. Their methodology, based on Peet and Watts (2004) research, embodied liberation ecology that contradicted prevailing development and conservation discourses. Their focus on conventional agricultural methods embodied an eco-populist perspective that valued local knowledge and rights (Guha & Martinez-Alier, 2006). This method corresponded with international initiatives advocating for the acknowledgment of indigenous rights and traditional ecological knowledge in environmental governance (Berkes, 2012).

The spread of palm oil plantations, exemplified by PT. KLM, illustrated Peluso & Vandergeest (2001) concept of primitive accumulation within Southeast Asian political ecology. This resulted in what Harvey (2003) describes as accumulation by dispossession, which involved reallocating resource access from local communities to substantial capital entities. The Peet & Watts (2004) term neoliberal ecology, wherein market principles and economic efficacy governing natural resource management. This growth corresponded with global trends in the corporatization of agricultural land (McMichael, 2012), however frequently contradicted conservation objectives and the rights of local communities.

The dispute was further exacerbated by entities such as land mafias, illustrating how diverse parties employed multiple forms of power to validate resource claims. Land mafias utilized the gray zones in resource governance identified by Sikor & Lund (2009), where legality and legitimacy intersect. Bryant (2015) refers to this as the politics of access in the management of natural resources. This scenario illustrated that political ecology encompassed not just the tensions between conservation and development but also intricate networks of stakeholders with diverse interests and strategies (Robbins, 2011). The comparison across these three discourses is illustrated in Table-2.

Table 2. Overview of three discourses

	Eco-Conservationism	Eco-Developmentalism	Eco-Populism
Supporting actor or participant	**Main Actor:** Mawas Borneo Orangutan Survival Foundation. **Supporting Actor:** Gibbon Foundation, Forest Protection Management Units, Production Forest Management Units, Environmental Agency, Forest	**Food Estate Porgram:** Departemen of Agriculture, Ministry of Public Works and Public Housing Indonesia National Armed Forces, and University of Palangka Raya. **Palm Oil Plantation Main Actor:** PT. Kalimantan Lestari Mandiri	Local Community (Dayak Ngaju), Wahana Lingkungan Hidup Indonesia (WALHI) Central Kalimantan, Save Our Borneo (SOB), Palangka Raya Legal Aid Institute, Solidaritas Perempuan Mamut Menteng.

	Eco-Conservationism	Eco-Developmentalism	Eco-Populism
	Management Units, NASA & Macron, Australia for flock tower use, Palm Oil Companies (PT. Sawit Sumbermas Sarana & PT. BCL), and KFCP.	**Supporting Actor:** Julong Group Indonesia from Tianjian Julong Group, China.	
Argument	The significance of peat ecosystems, Orangutan conservation, reforestation, and habitat preservation.	**Food Estate:** Food estates enhance national food security and modernize agriculture on peatlands. **Palm Oil Plantations:** Economic development through palm oil plantations, and balancing business interests with social responsibility.	1) Defending land rights and traditional practices 2) Refusing to become labores on their own land 3) Injustice in land compensation
Mission	Restoration and protection of peat ecosystems, conservation of Orangutans, and empowerment of local communities.	**Food Estate:** Creating integrated food production centers, improving farmers' welfare, and supporting the development of the new capital cit. **Palm Oil Plantations:** Economic development through palm oil plantations, and balancing business interests with social responsibility.	1) Maintaining autonomy and identity 2) Preserving traditional agricultural practices 3) Obtaining fair compensation
Self-representation	Protector of the ecosystem, and agents of conservation and empowerment.	**Food Estate:** Facilitator of development and guarantor of food security. **Palm Oil Plantations:** Agent of economic development and provider of employment opportunites.	1) Guardians' tradition and local wisdom 2) Victims of injustice in development
Views on other actors	**Local Communities:** Seen as the frontline in conservation activities, and need to be educated about conservation. **Goverment:** Needs to focus more on conservation programs. Food estate: A policy that benefits the	**Food Estate:** **Local Communities:** Engaging in activies that neglect environmental health, need to be directed towards modern agriculture. **Companies:** Partners in development. **Conservation:** Need to balance conservation	1) Companies: Exploitative and unfair 2) Government: Lacks understanding of local needs. 3) Conservationsts: Restricting access to resources.

	Eco-Conservationism	Eco-Developmentalism	Eco-Populism
	agricultural sector more than conservationn, viewed as a way to boost the local economy, but in implementation has neglected ecological needs **Palm Oil Plantations:** Perceived as neglecting ecological needs. However, it's important to engage palm oil plantation businesses to participate in environmental protection.	with development. **Palm Oil Plantations:** **Local Communities:** Need to be educated about modern development. **Conservation:** Too restrictive on development. **Government:** Partner in development.	

The intricacy of disputes in Mantangai's peatlands was seen in the convergence of diverse interests within the same area. In the same region where Mawas BOSF designated conservation zones for orangutan habitats and peatland protection, local communities had historically utilized the area for fishing, collecting non-timber forest products, and practicing traditional agriculture. The scenario grew increasingly intricate as the government designated portions of this territory for the food estate program, concurrently with palm oil corporations aiming to expand plantations in the same region. This overlap generated what Peluso & Lund (2011) refers to as competing claims, wherein each actor possessed genuine claims grounded in their individual viewpoints.

The complexity of this interaction increased when analyzing how each player employed different forms of legitimacy to substantiate their assertions. Mawas BOSF employed scientific legitimacy and global conservation mandates; the food estate program depended on state authority and food security objectives; palm oil companies utilized formal-legal legitimacy via official permits, whereas local communities grounded their claims in customary rights and historical management practices. According to Hall et al. (2011), this dispute extended beyond mere physical access to land; it encompassed the authority to dictate resource management and the entitlement to oversee such management.

5.2 Covert conflicts and power relations

This political ecology study demonstrated that underlying conflicts in Mantangai District arose from what Watts (2017) refers to as violent environments—circumstances in which resource access and control engendered intricate power struggles. According to this concept established by Peluso & Watts (2001), these disputes pertained not only to tangible resources but also to interpretations, representations, and the legitimacy of environmental assertions.

This intricacy was apparent in former MRP regions, where three primary interests intersected. Mawas BOSF designated protection zones for Orangutans and peat ecosystems, but local residents had historically utilized these regions for fishing, non-timber forest products, and traditional agriculture. The food estate initiative exacerbated this issue by designating the land for extensive agricultural use.

This convergence of interests engendered multiple latent conflicts. Initially, a conflict arose between Mawas BOSF's conservation initiatives and local resource exploitation activities. Notwithstanding Mawas BOSF's efforts in community participation, skepticism and opposition endured among certain community members, akin to the results of Thorburn & Kull (2015) regarding peatland disputes.

The food estate program's transformation of peatland for agricultural use generated a clash between governmental development objectives and ecological-social realities. This scheme jeopardized both Mawas BOSF's safeguarded peat functions and traditional agricultural methods that had been adapted to stifle various characteristics that had taken place over centuries. This failure illustrated the disparity between top-down policy and local circumstances, as posited by Scott (1998).

The expansion of palm oil plantations, which restricted traditional community access and jeopardized protected areas, incited unresolved land disputes. In Kalumpang Village, transportation lines for plantations intersecting productive community rubber gardens generated conflict between corporate interests and local livelihoods. This corresponded with the findings of Purnomo et al. (2017) about power dynamics in Indonesian land disputes. These disputes exemplified what Homer-Dixon (1999) refers to as structurally-induced environmental scarcity.

5.3 Environmental ethics underpinning actors' actions

The political ecology analysis of environmental ethics in Mantangai elucidated what Robbins (2011) refers to as moral ecologies—value systems that influence human-environment interactions. These intricacies were evident in the varying interpretations and treatments of the same peatlands by different stakeholders.

Three distinct environmental ethics systems intersected in the Mawas conservation area. Mawas BOSF's methodology embodied biocentrism, emphasizing the conservation of orangutans and peat ecosystems through a scientific perspective (Castree & Braun, 2001). They regarded peat degradation and the reduction of orangutan populations as ecological catastrophes necessitating stringent conservation measures. This methodology frequently contradicted local community practices that exhibited an alternative ecocentrism through *pamali* beliefs and reverence for *pukung pahewan*. This conventional ethical framework facilitated resource utilization while preserving ecological equilibrium through cultural constraints (Callicott, 1997).

The food estate initiative and palm oil growth exemplified what Escobar (2006) refers to as techno-nature, perceiving nature as a commodity that could be optimized through technological intervention. This contrasted with the environmental ethics of local communities, which, according to Tsing's (2015) investigation, revealed multispecies entanglements and a profound comprehension of human-nonhuman relationships in peatland ecosystems. Concurrently, food estates and palm oil plantations adopted an anthropocentric perspective, perceiving peatland chiefly as a commercial resource that could be enhanced through technological means (Escobar, 2006).

The interplay of these three ethical systems generated intricate field dynamics. In regions identified by Mawas BOSF as rigorous conservation zones, local populations upheld traditional practices of non-timber forest product collection that they regarded as compatible with nature protection. This behavior, despite contravening statutory conservation regulations, demonstrated a profound comprehension of human-nature interrelations, as examined by Tsing (2015) in the context of multispecies entanglements. Simultaneously, palm oil plantations and food estate initiatives jeopardized both Mawas BOSF's conservation strategy and the traditional environmental ethics of local communities.

This contention illustrated that the discourse on environmental ethics in Mantangai transcended the dichotomy of conservation and development, focusing instead on legitimizing diverse interpretations and valuations of nature. According to Goldman et al. (2011), the frequently overlooked environmental knowledge and ethics of local communities (subaltern environmentalism) provided a more nuanced comprehension of sustainability than prevailing environmental orthodoxy (Forsyth, 2003).

5.4 Overlapping interests and complex power dynamics

The intricacy of conflicting interests in Mantangai's peatlands exemplified what Nightingale (2015) refers to as various scales of power dynamics. Dayak Ngaju communities locally negotiated economic necessities, Mawas BOSF conservation mandates, and pressures from palm oil expansion, resulting in what Bebbington et al. (2018) term spaces of contradiction. The complexity of this overlap increased with McCarthy (2006) concept of nested scales of governance.

The food estate program embodied the national development goal, influencing local power dynamics and resource accessibility, consistent with Lund (2016) observations on the creation of layered sovereignties through large-scale development initiatives. According to Tsing (2005) friction analysis, these converging interests generated unforeseen power dynamics. Mawas BOSF's conservation initiatives occasionally clashed with local livelihood methods, exemplifying Li (2014) contradictions of improvement. Simultaneously, the expansion of palm oil engendered what Dove (2011) refers to as banana grove politics, altering landscapes in both physical and socio-political dimensions.

This complexity illustrated the necessity for Agrawal & Gibson (1999) nested governance frameworks, which recognize multiple layers of interests and authority, hence endorsing Ribot & Peluso's (2003) assertion that access should be seen as bundles of power. These findings corroborated Syam et al. (2019) assertion regarding the significance of adaptive resource management. In Mantangai, local people established adaptive management techniques that demonstrated a profound comprehension of peatland ecosystems. This corresponded with the findings of Arsyad et al. (2020) regarding the necessity of local consideration and community engagement in development plans.

In contrast to more straightforward livestock waste management scenarios (Syam et al., 2019), peatland management encountered various obstacles stemming from conflicting interests. According to Arsyad et al. (2020), development projects in border regions necessitated strategic approaches that concurrently addressed social, economic, and environmental factors.

5.5 Consequences and prospective directions

The complexity illustrated in this research highlights the necessity for more integrative and participatory strategies in peatland management. Engagement with stakeholders is essential for achieving solutions that reconcile ecological, economic, and socio-cultural dimensions (Reed et al., 2014). Local knowledge and traditional practices need to be integrated with contemporary scientific methodologies for the sustainable management of peatlands (Ece et al., 2017).

The Mantangai District instance exemplified the necessity of policy reform that took into account the socio-ecological intricacies of peatlands. There was a necessity for more flexible and adaptable policies to address local conditions and dynamics of peat ecosystems (Gallemore et al., 2015). Moreover, enhancing local community capacity and empowering various stakeholders is essential for mitigating power disparities in natural resource management (Purnomo et al., 2017).

WALHI's initiatives advocating for the AROL and SF programs demonstrated possibilities for mitigating resource access disparities. Nonetheless, implementation issues, such as insufficient transparency and restricted permission terms, underscore the necessity for additional reform in land and forest governance in Indonesia.

The contestations around peatland management in Mantangai District underscore significant issues in reconciling conservation, economic development, and the welfare of local communities. A comprehensive and equitable shift of the development paradigm was necessary to tackle this complexity (Escobar, 1998; Robbins, 2011). Methods that combine traditional ecological knowledge with contemporary research, while incorporating environmental ethics in decision-making, might provide a more sustainable and equitable future.

6. CONCLUSION

This study elucidates the intricate disputes in peatland management in Mantangai District, Central Kalimantan, including multiple stakeholders with differing interests. This dispute illustrated many viewpoints common in political ecology, including: eco-conservationism (Mawas BOSF), eco-developmentalism (government food estate and PT. KLM), and eco-populism (WALHI and local communities).

Critical findings revealed underlying contradictions among conservation initiatives, governmental development schemes, oil palm plantation proliferation, and indigenous local customs. The food estate initiative encountered implementation difficulties stemming from ecological and social discord, whereas palm oil expansion generated ongoing land conflicts. In contrast, conventional local agricultural methods exhibited a harmony between resource usage and environmental conservation.

This research greatly enhanced the understanding of power dynamics and conflicts in peatland management, thereby supplementing the political ecology literature with a geographically situated empirical case study. Integrating views from environmental ethics provided fresh insights into the disputes surrounding natural resource management. Practical implications underscored the necessity for more integrative and participatory strategies in peatland management and policy reform, taking into account socio-ecological complexities. It theoretically bolstered arguments for incorporating local knowledge and environmental ethics into political ecology study.

Despite being confined to Mantangai District and lacking quantitative analysis, the findings established a robust platform for future research. Recommendations encompassed comparative studies of peatlands in Indonesia, the development of management models that integrate political ecology and environmental ethics, longitudinal studies of contestation dynamics, and gender-based analyses of the impacts of peatland management on men and women. The research underscored the intricacies of sustainable peatland management, guiding the formulation of more inclusive and sustainable policies that reconcile ecological, economic, and socio-cultural dimensions.

Author Contributions: Each team member possesses distinct responsibilities in the research. Salsa Rizkia Meilinda: Conseptualization, methodology, data acquisition and analysis, and manuscript production. Darmawan Salman: Conseptualization, methodology, manuscript preparation, and editing. Sawedi Muhammad: Conseptualization, methodology, and evaluation.

Conflicts of Interest: No potential conflict of interest.

Acknowledgments: Recognize this article constitutes a segment of the author's master's thesis at Hasanuddin University, Makassar, Indonesia. The author expresses gratitude to the Indonesian Ministry of Education, Culture, Research, and Technology for financing this research under

Contract Number: 02035/UN4.22/PT.01.03/2024. The author extends gratitude to all informants at the research site and to those who have supported me throughout this process.

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