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List of Acronyms

ARC	Agrarian Resource Center
ARR	Afforestation, Reforestation and Revegetation
BPS	Indonesian Statistics Bureau
BRG	Peatland Restoration Agency
CCB	Climate, Community and Biodiversity Standards
CCBA	Climate, Community and Biodiversity Alliance
FFB	Fresh Fruit Bunch
Gakkum KLHK	Directorate of Law Enforcement of the Ministry of Environment and Forestry of the Republic of Indonesia
GHG	Greenhouse Gas
IUCN	International Union for Conservation of Nature
IUPHHK-RE	Business License for the Utilization of Timber Forest Products - Ecosystem Restoration
JKPP	Indonesian Community Mapping Network
PCP	Petty Commodity Producer
PS	Social Forestry
PSR	Smallholder Oil Palm Rejuvenation
REDD+	Reducing Emissions from Deforestation and Forest Degradation plus
RMU	PT Rimba Makmur Utama
VCS	Verified Carbon Standards
VCU	Verified Carbon Units
WRC	Wetland Rewetting and Conservation

Abstract

This study aims to unpack the dynamics of human-nature relationships in rural peatlands. This research specifically addresses the ecological dynamics and labour process, especially on how both the process of agrarian differentiation co-constituted with the ecological change, thus both affecting and being affected by each other. The research uses frameworks of labour geography and agrarian political economy with an emphasis on the configurations of the conditions of production in an agrarian setting. The research is carried out in the peatland area, specifically Bapinang Hilir, Pulau Hanaut, and Central Kalimantan. While the area was 'recently' inhabited in the 1800s, the changes from canal dredging project, logging, peatland fire, and REDD+ have been existing along the agrarian dynamics of the peatland with its specific land tenure. In the process, agrarian dynamics intersected with the ecological change from fire, drought, and acidification, which unfolded chances for farmers to accumulate more land, either in the period of canal dredging project or REDD+. The petty commodity producers counteract the changing configurations from degradations and REDD+ restrictions by embedding themselves in the timber economy and later in palm oil. Both actions of farmers and petty commodity producers, as spatial agents, also contribute towards the changing configurations along with climate change in the forms of the intensification of El Nino events and external changes (REDD+ and timber and palm oil economy). Much of the literature often relegates the ecological change as the excess of capitalist commodity production or homogenizing the impact of degradations. This study contributes to the possibility of understanding that both processes of ecological change and agrarian differentiation are inseparable. The study uses primary empirical material from ethnographic-oriented fieldwork on two occasions separated temporally and integrates it with the satellite imagery data, documents, and literature.

Relevance to Development Studies

Arsel (2022) emphasized the urgency of questioning the role of class in the face of the climate crisis, which required situating the capital-labour relation into nature with all its contradictions and tendencies. Moreover, the attempt has also been invited by Bernstein (2010b), Borrás Jr. et al. (2022), and Akram-Lodhi & Kay (2010), who gave a fruitful path to introduce ecology as part of agrarian questions. The research paper seeks to address the needs by presenting the understanding through the combination of ecological and agrarian political economy in approaching rural settings, climate change and ecological degradations.

Keywords

Conditions of production; agrarian differentiation; labour geography; ecological change; peatland; El Nino.

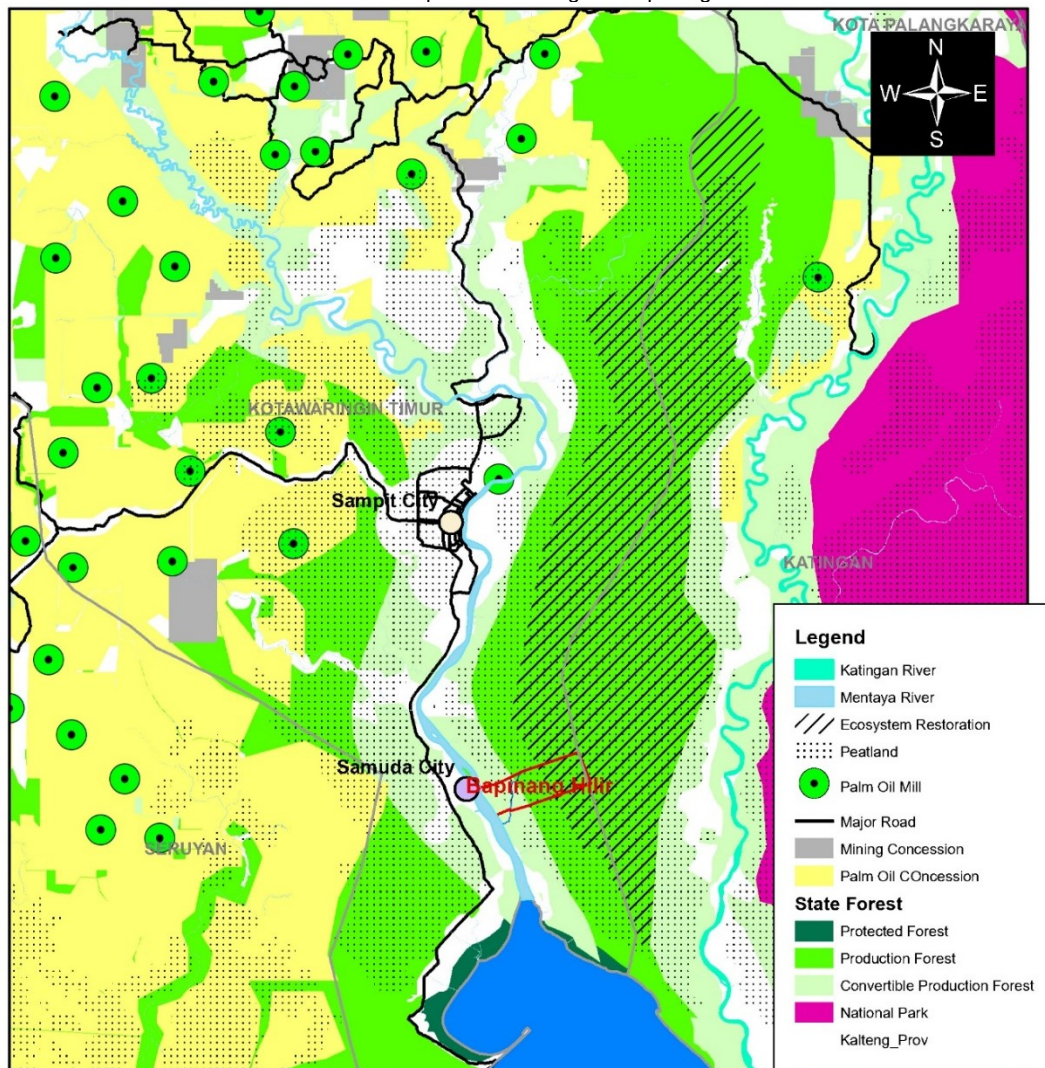
Chapter 1

Introduction

1.1 The Space Where People Belong

If one travels from Samuda, Kotawaringin Timur Regency, Central Kalimantan Province, Indonesia—and moor on the bank of Mentaya River and walk towards Babirah River, one can see coconut trees uniformly standing perpendicular to the canals. The majority of people living there is farmers, logger and agricultural workers. “I do not know. It was there when I was a child”, a 40s woman told me when I asked the age of coconut trees near the Mentaya River. “It is owned by HE before, it was his father’s.” The rows of coconut got smaller the nearer to Babirah River until it eventually changed to palm oil. “Ah, that palm oil tree is owned by HD; he is now rich and seeking to buy land in the *darat*” (Interview, 19 December 2020).

Map 1.1
Structure map of surrounding the Bapinang Hilir.



Source: Jaringan Kerja Pemetaan Partisipatif (personal communication, 15 June 2020), Global Forest Watch (2019) and OpenStreetMap.org.

Once crossing the Babirah River, a settlement can be seen with their small garden of rubber, coconut, and palm oil standing. When one leaves the settlement towards the forest by following the canal, devastation from the peatland fire can be seen. Rubber trees burned, palm oil trees collapsed, and burned soil everywhere, yet still, people tried to plant paddy on top of it (See Map 1.1). It was around December 2019, and still, the devastation from the peatland fire can be seen and felt. It was tense at the time, a tension derived from the peatland fire, the presence of a concession followed by the banning of shrub burning, the announcement of a 15-year jail sentence for encroaching and burning forest, and forest patrol¹.

Figure 1.1

Farm condition post-2019 fire, many trees were collapsed and now land is being planted by rice.



Source: Fieldwork 2019.

AS, a farmer and logger, told me what happened around October 2019; he saw ashes and smoke rising into the sky, originating from south of his home as it became nearer to his farm. Eventually, the fire crept up north until it reached Babirah River, where it ended. He and many other of his neighbours could just see the fire ravaging their farms as they did not have the means to extinguish the peatland fire and were afraid of being suspected as criminals who burnt the forest area, they could just wait and hope that the damage is not severe. Their reluctance to guard their farms is due to the newly gained knowledge of a fine of 15 years imprisonment for those setting up fire propagated by forest enforcers from the Ministry of Environment and Forest (Gakkum KLHK) in the preceding months (Interview, 7 January 2020). AS live in Bapinang Hilir village, Kotawaringin Timur Regency, Central Kalimantan Province. The area where he lives is in the tributary of the downstream part of the Mentaya River and was newly designated as the REDD+ project² zone of the Katingan-Mentaya

¹ See Gakkum KLHK (2020).

² REDD+ is an abbreviation for Reducing emissions from deforestation and forest degradation. The plus means that there are additional activities such as sustainable management of forests, conservation and enhancement of carbon stock (See UNFCCC, no date).

Project owned by PT Rimba Makmur Utama (RMU) in 2016, which aims is to reduce the carbon emission within the said concession.

As the dust settled, he checked his garden and saw that his rubber trees were burned, and his paddy field charred with burned peatland. He cried as he understood that rubber latex could not be produced anymore and that it would be harder to plant rice in scorched land due to the increasing brittleness of the land and exposed pyrite layer. Both increase the necessary labour time to plant rice without a guarantee of a good harvest due to an increase in acidity. At least it needs five years when the dust really settled, the land healed, and the harvest returned to normal. He was angry when enforcers came accusing him of burning land and pointing out that his farm was burned too as no reason to incinerate the fruit of his own labour. In his mind, the only left for him to feed his household was to go to the forest and do logging, but the realization struck him that going to the forest to cut trees is now difficult. It is not only due to the presence of the carbon concession, but also the distance to the forest is getting further as it was burned. Still, he tried to plant it with rice, “This is my way of living, but it is getting harder, my hand now in blister to create a hole for seeds.” He contemplated whether to sell some of his burnt land to HD (palm oil farmers) and HE (coconut elites) as some of his neighbours did or start planting palm oil.

The AS story exemplifies those who owned small land on the landscape east of Babirah River and needed another job to fulfil their lives. It was a time when the fire was ravaging their land, restrictions from the concession heightened and at the conjuncture of the source of their living. While for those like HD and HE, the peatland fire and restrictions offer an opportunity to capitalize and expand their own business whilst, at the same time, HD and HE is still a local rich farmer.

Perhaps it was due to peatland, a type of wetland created by submerging organic material in water and retaining its water even during dry sessions; as Furukawa (1994) stated, peatland is a place of transit, a place where people are not fully settled. However, Furukawa noted that until the war, diaspora Banjarese learnt about canal agriculture and started reclaiming the land in the end of 19th century. In the early 20th century, the Dutch liberal agrarian reform of 1870 (enacted in 1888 in Kalimantan) enabled privately held concessions. More people settled as labour needed to be brought from Madura and Java Island and Banjarmasin. The area across Bapinang Hilir was called “Samoedacomplex” which entails a concentration of coconut plantings and shipping industries sending copra and coconut to ports of Southeast Asia. Still, colonial policy on agrarian matters focused on Java and Sumatra Island, which left commodity crops to the local community. The policy enabled developing the productive forces of canals and relation of production, which, according to a local story, started to move towards Bapinang Hilir and plant coconut trees on the banks of Mentaya River and build a canal, then control it. Now, the first family who moved to Bapinang Hilir and dug canals became the ones who controlled it, and his descendants, HE, now became one and own a large amount of land west of Babirah River (Hunger, 1916; Koerts, 1937; Watson, 1984; Lindblad, 1986; Darmadi, 2016).

Furthermore, the New Order designated a swath of Indonesian land as a “production forest” and logging concession, which both they applied to the southern part of Mentaya and as for concession, it was granted to PT. Mentaya Kalang (a logging corporation)³. The way they operate involves many of the residents cutting the trees, where local people cut the trees, sell them to the intermediaries and then to PT. Mentaya Kalang before they export them. As with the findings from Tsing (2003), it was a phase where the money came fast and ran fast, and much of Bapinang Hilir village changed their focus of living towards the logging economy.

³ See Winters (2011) and Tsing (2003) for further elaboration on Indonesia’s New Order.

Alongside the changing labour regime from a heavy emphasis on agriculture towards logging, the state-sponsored peatland reclamation was happening simultaneously. The reclamation of peatland has intensified since the 1990s, stemming from the ideas of increasing the rice cultivation areas in peatland implemented by the government. The program culminated nationally in the Million Hectare Peat Development Project in the neighbouring regency in Central Kalimantan (See McCarthy, 2013). Village and district-level government, controlled mainly by the descendants of the first pioneer in Bapinang Hilir, followed suit. Then, adjoining the Central Kalimantan Province Regional Planning 1992, the regency in which Pulau Hanaut reside started to offer Bapinang Hilir as a designated location to implement the irrigation project. The irrigation project deepens and extend the existing handle to open more land for agricultural purpose (Pemda Kalteng, 1995). Because it is a state infrastructure project, the land was distributed among people, including AS and DT, but due to most people engaged with the logging economy, most of the land was sold to the first family who controlled the land.

The very same peatland fire that followed after canal dredging project and devastate smallholder farming led towards the presence of REDD+ project in the area. According to McCarthy et al. (2012), Fairhead et al. (2012), and Carmenta et al. (2021) it is a new types of commodity which is avoided carbon emissions. Therefore, the business required land to be controlled in keeping carbon to stay in the wood and the soil from the emission threat from smallholders and companies. In doing so, it requires the direct control of the land which was achieved by holding a land certificate (ownership or concession), and smallholder economic activities surrounding the concession. The latter control it then intensified as the business is not only selling the avoided emissions but also the betterment of local livelihoods following the prescribed interventions. What is happening in Bapinang Hilir is the latter one, measures on limiting access to land and forest are being imposed while imposition of the way of living are undertaken.

1.2 About the space: a rationale

This thesis taken inspiration derived from Akram-Lodhi and Kay (2010, p. 269) statement on ecological dynamics in the agrarian studies which is “[...] agrarian question must critically investigate the character of ecological relationships and the ways in which they impinge upon and alter the resolution or otherwise of the agrarian question, and in so doing address contradictions of class and ecology if it is going to explain social change in contemporary rural settings.” The statement is central to the premises that biophysical conditions “[...] must directly impact upon the process of production and hence processes of class formation [...]” Which in the empirical condition of the southern Mentaya River, the agrarian differentiation—concerning people’s agency for either satisfaction of social reproduction or accumulation and its relation to the ecological change are being co-configured. Therefore, to follow Borras Jr et al. (2022), there is need to “[...] employ a more expansive, historically informed analysis that situates ‘climate’ within a wider set of environmental struggles in agrarian settings.” Which means that there is a need to historically inquire the biophysical conditions of which it affect/affected by the social differentiation process within the agrarian setting thus implying that the impact of climate changes (Including the increasing occurrence of El Nino, see Trenberth and Hoar, 1997; Yeh *et al.*, 2009) is not distanced to the preexisting conditions in the specific and local configuration of agrarian setting.

The existing approach on the agrarian change—from the agrarian political economy scholars, mostly situate that the ecological changes as the excess of the capital penetration into the rural society—which is also part of the critique from political ecologists. The lack of explanations was explained by Bernstein’s conclusion that the underlying assumption of

forever developing the productive forces⁴ will circumvent the ecological change and hamper the agrarian political economy scholars' inquiry in comprehending ecological change in the development of capitalism (2010b). To put that in perspective, Borras Jr. et al. (2022, p. 4, original emphasis) puts that "[...] many scholars of political ecology and agrarian studies have analysed localised relations with the understanding that these take shape in the context of broader, global capitalist relations. With climate change, though, we are forced to examine such relations in the context of broader *environmental* relations as well. Just as capitalism is everywhere, so too is climate change."

However, it is to acknowledge that the specific question on the area surrounding the issues of land degradation and its impact on rural people has been analyzed by the political ecologist. Historically, the drive to analyze land degradation and the impacts started with the rejection of neo-Malthusians on their simplistic explanans of the over-population, poverty, environmental mismanagement as sources of environmental problems and Marxist overemphasis on capitalist development and its impact on land as stated in the previous paragraph. The neo-Malthusian logic can be traced to Malthus's emphasis on the human needs of nutrient intake and overpopulation will overpour the carrying capacity of nature itself. In the neo-Malthusian's view of ecological change, Gausset and Whyte (2005, p. 8) explained it as "[...] scarcity created by an imbalance between people and resources, the people are seen as over-exploiting the resources in an unsustainable way. This leads to a degradation of the resource base (soil degradation, fishing beyond the natural rate of reproduction, etc.), which leads to greater scarcity, greater over-exploitation and greater degradation". Following the neo-Malthusian logic, it is common to view the problem of environmental degradation in the slogan "poor people make poor land." These views, as pointed out by Benjaminsen (2015), are seen as "blaming the victims", neglecting the structural conditions necessary for the phenomenon to unfold. Instead, it encompasses the changes in the environment, ideational underpinnings of an agent in their engagement of the environment and external influences (Forsyth, 2004; Benjaminsen, 2015).

However, the rejection of Marxist analysis entails a lack of deeper analysis of how the ecological changes are situated alongside the labour process and its dynamics following the changes in the natural and social landscape. While doing so, it did not emphasize the dynamics of commodification that unfolded in the process. Unfortunately, it implies that differing social strata (class, gender, race, income, etc.) with their different situation facing ecological change are left unanalyzed. Its rejection⁵ of the commoditization process and social difference in the rural setting make it fall into a more ideological—in this sense populism, with the exemplary notion of 'indigenous vs modernity', 'local vs external', or 'community vs state' (Bernstein and Woodhouse, 2001). Moreover, when the social difference is acknowledged, it is situated as static categories of differing experiences and outcomes without delving deeper into the analysis of how it unfolded and its relation towards the changing ecology. Therefore, the lack of analysis on the changing relation of production with its implication on the agrarian setting would blur the very aim of the analysis, the human-nature relationship with its ever-changing ecology and social relation.

Moreover, the forefront Marxism debate, Moore and Foster debates, primarily dealt with the ontological underpinnings of situating capitalism with ecological change. The debates imply their need to resituate and critique the preexisting explanation of the development of capitalism. Hence, the focus is subjected towards explanation on the global scale in terms of "World-Ecology" on the capitalist "project" of rearranging the ecology which includes society, humans, and modes of production (Moore, 2010a, 2010b, 2015). While Foster (2000)

⁴ This is a central assumption in orthodox Historical Materialism. See Cohen (2020).

⁵ See Forsyth (2004).

and Clark & Foster (2009) “biospheric rift” in viewing the increase of greenhouse gases (GHG) as the excess of capitalist development in alienating human-nature relationship. Thus, emphasizing that ecological changes is the excess of Capitalist development. Therefore, it is not enough to confront the landscape of the southern Mentaya River, where the complexity of agrarian classes exists and operates in relation to the changing natural and social landscape.

The empirical condition in the southern Mentaya River of agrarian differentiation—concerning people’s agency for either satisfaction of social reproduction or accumulation, and its relation to the peatland degradations and landscape that is being configured by the class dynamics and concession entails the need to situate the human-nature debates in rural settings, especially on its labour process. This thesis aims to unpack these within the temporal limits of the 2010s, where Southern of Mentaya was at the crossroads of multiple attempts of configurations, an unfolded landscape from the past of the differentiated farmers with its further underlying commodification process and carbon business, of which are situated within the changing natural landscape of peatland. Following the introduction chapter, the thesis will explain the theoretical framework being used, agrarian political economy and labour geography, including its keywords of “spatial agent”, “commodification”, “configuration” and “agrarian differentiation”. It is followed by a chapter that explains the context within the landscape of the southern Mentaya River, its labour regime and another chapter on the history from the first settlement up to the canal excavation project. Then, a chapter entails an explanation of the dynamics following the arrival of REDD+ and changing the labour regime in relation to land degradation, with its emphasis on the current configuration of class and the contestation arising from the changing social and natural landscape.

1.3 Of the space

The part of the story of what happened raises questions about **How was the history of the capitalist labour process as it unfolded the configuration of differentiated impact and the ecological change in itself? And how does the spatial configuration by carbon concession relate to the existing configuration of class and off-peatland landscape? And why do people change their commodities?** Following the questions, the case is telling the intertwining relationship between labour in capitalist relation of production with its agrarian differentiation along the ecological change and what it entails. Its landscape located upon peatland enables rapid changes and thus accumulated along the history of land usage since cash crops agriculture in peatland is enabled and constrained—and historically so, by the creation of canals. While canals unlock the wealth from agriculture, they also entailed disturbance upon peatland. A canal as a waterway for water discharge poses a problem if not managed adequately; it will result in the drying of the peatland, which could expose it to acidic pyrite land and potential danger during a very dry period. Therefore, agriculture in peatland is a delicate balance between social reproduction and accumulation. Furthermore, Bapinang Hilir entails a case where the cash crops concession is inexistent; thus, commodification and changing of cash crops are pretty much conditioned both by the surrounding areas and the dynamics that exist in the place. Unlike widely documented cases of a cash crops concession and, in the process, change its local social relation.

The conditions in Bapinang Hilir are a spiral of agrarian differentiation and ecological change feeding each other. It was class dynamics operated during canal extension, which was situated within social and natural landscapes at the time, with a high cost to plant cash crops and the presence of a logging economy. The project unfolded further agrarian differentiation, peatland fire and drought in the later years, in which the cycle of accumulation repeated. However, it also can be said that involvement in the logging economy is part of the

smallholder's agency in satisfying their social reproduction, at least until the timber industry collapses in 2000, as well as the case of palm oil in the present period. The similarities are that both smallholder choices are considered unsustainable in the mainstream narrative, logging will reduce biodiversity and palm oil is a main driver of deforestation in Indonesia. The difference between those periods is the presence of carbon concession, which legally controls the landscape of carbon sink and the people activity who operate in it, and there is no available land as the west was controlled by rich farmers and the east was controlled by carbon concession.

This research paper aims to unpack the issue of a complex human-nature relationship of which these questions are historically unfolded, especially the story concerns the commodification that entailed in the rural peasantry and ecological change, which presented itself as degradation and control of the landscape by the carbon concession. Therefore, the underlying assumption of this research is not sharply dividing the human and nature nor collapsing them analytically, and rather it was distinct as human consciousness made it so—thus their agency and differentiated as capitalist labour relations imposed said differentiation.

Chapter 2

Methodology

2.1 On Rural Configuration

The epistemological position of this research is situated under the Marx notion of labour itself, which is a social process of transforming material of nature through human action towards what was considered able for humans' consumption. Human itself is perceived as nature who confront nature as Marx stated that labour is an "[...] activity over the external entity and changes it, and in the process, simultaneously transforms himself as nature" (Marx, 1990, p. 283). The labour process—a process in which human aims to satisfy their social reproduction and then simultaneously act as an intermediary in the human-nature relationship.

To emphasize the locally specific configuration of human-nature relationship in capitalism, it is useful to situate the capitalism relationship to nature. According to O'Connor (1988), Capitalism, with its logic of market dependence or production for exchange, implies the subordination of use value to the exchange value⁶. As the only thing its use value is producing value, the labour-power, with its constitution as the natural necessity of human-nature mediation, is externalized and alienated from the capitalist system in forms of ecological degradation and marginalization. To sustain material necessity for the existence of capitalism, labour power and land (Marx, 1990, p. 638)⁷, it is imperative to constantly produce nature to sustain social reproduction and for accumulation—as the economy cannot be possible on a destroyed planet. Therefore, it becomes a contradiction of capitalism, as at one point it constantly degrades nature and marginalize human, and another, it needs both to sustain the accumulation and labour's social reproduction. O'Connor states that the externalization of social and environmental conditions implies the under-reproduction of the material necessity for its continuation of accumulation, which he called conditions of production⁸. The human-nature relationship through the centring labour process can be seen through his explanation of the notion of 'conditions of production' as it is a locally specific configuration of biophysical conditions, social reproduction and structures necessary for production. O'Connor situates the condition of production as a space of "[...] which structures and is structured by the relationship between people and 'environment'" (1988a, p. 16 & 17).

Situating the southern Mentaya River, it is important also to emphasize the classes of labour in the locally specific configuration of the landscape of capitalism. Herod (1997) states that the present analysis of landscapes of capitalism mostly emphasizes how capitalist configuration and undermining the agency of labour, which is vital in this case. However, focusing on labour does not imply that labour is separate from the capitalist configuration and a historic. Instead, they also "intentionally and unintentionally produce economic geographies through their actions [...] while recognizing that they are constrained (as is capital) in these actions" (1997, p. 3). Therefore, he coined that framework as "labour geography", which the

⁶ See Sweezy and Dobb (1950) for debates about the central notion of capitalism as a 'relation of production'.

⁷ Marx (1990, p. 638) stated that "Capitalist production, therefore, only develops the techniques and the degree of combination of the social process of production by simultaneously undermining the original sources of all wealth- the soil and the worker."

⁸ Another contradiction of capital is over-accumulation (See Harvey, 1984), which is not a focus of this thesis.

main assumption is that in the contradiction of capital, “[...] workers are not just historical agents but are also geographical ones, that workers’ lives are spatially embedded in the landscapes in which they live, that this spatial embeddedness may be enabling and constraining of their social praxis, and that workers will thus try to shape in particular ways the geographical structures and relationships within which they live their lives” (Herod, 2003, p. 113). Emphasizing the labour on the landscape configuration is important in the present case of climate change, especially on the response and its impact. Labour geography can focus on how ecological changes are being reshaped through labour. While doing so, it incorporates the notion of marginalization and livelihood impacts while rejecting the ‘inert’ and victimizing those impacted by the climate (Parsons and Natarajan, 2021, p. 409).

Recently, the concepts of labour geography have been used as a framework in the analysis of rural settings. Pye (2017), through the conception of labour geography, elaborates on the daily resistance of oil palm plantation labour. Pye situates labour that is subjected to precariat conditions react within the specificity oil palm plantation and how informal networks among labour are created and used either as forms of labour recruitment or information about better working conditions. If Pye situated it in the plantation labour, Natarajan et al. (2019) are on the persistence of classes of labour. They explore the configuration which emphasizes the persistence of farmers’ relationship (as classes of labour) to land, albeit unrooted due to debt bondage and being forced to work in kiln factories. They found that the cause of separation from land and debt bondage was a disease, ecological change, and failed investment, which uprooted them from agriculture and focused on how labour’s agency responded towards it. Natarajan’s method is further deployed in analyzing the petty tobacco producers in relation towards ecological change in the forms of water depletion (Natarajan, 2021), thus further broadening the analytical reach of labour geography towards agrarian classes.⁹

2.2 Agrarian Differentiation, ecological change and labour agency

In the agrarian political economy, commodification is central to analyzing the changes in the agrarian landscape. The commodification is “[...] central to how ‘people’ – and which people – interact with their environments, including intensified uses of soil and water resources independently [...]” (Bernstein and Woodhouse, 2001, p. 319). The commodification informs how the landscape of production and reproduction is transitioned into capitalist commodity production. Due to the nature of the agrarian landscape itself, the changes by which peasantry is being subsumed is a tension of needs to socially reproduce or accumulate—thereby multiple classes. Whilst the initial impetus of changes itself is driven from the outside, the internal dynamics of classes in the agrarian landscape is mostly a focus on agrarian political economy studies. Moreover, on the issue of environmental change, traditions of the agrarian political economy start the questions from “whose environments/resources, and whose livelihoods are generated from access to, use and management of them, in what ways, and with what effects (both social and environmental)” (Bernstein and Woodhouse, 2001, p. 319 original emphasis).

The focus on reproduction became a central topic in the inquiry of the extent and process of commodification towards the peasantry with its resulting process of agrarian differentiation. Bernstein’s (1977, 1979) analysis of African peasantry revealed the mechanism underpinning agrarian differentiation by incorporating cross-sector analysis between industrial

⁹ This Paragraph is an expanded version of a final essay for ISS-4240 Course “Agrarian and Food Politics” (Prawiranegara, 2023a)

capital and peasantry. The incorporation into the capitalist commodity relation was through the squeeze from decreasing returns to labour from land exhaustion and using means of cultivating that can only be bought from the capitalist market. Moreover, the peasant household also undergoes the squeeze from the deteriorating price of agricultural products in the capitalist market due to suppression of the cost of food for the urban proletariat and raw materials to ensure high profits for the capitalist. Two squeezes imply surplus extraction by the capitalist market and peasantry as a source of continuous primitive accumulation (Alavi and Shanin, 1988). The assumption for the squeeze is that peasant social reproduction has been engaged in the capitalist market to a certain extent.

Furthermore, this is the underlying mechanism that leads towards agrarian differentiation, which is a “[...] dynamic process involving the emergence or sharpening of ‘differences’ within the rural population” (White, 1989, p. 19). White further explain that “differentiation thus involves a cumulative and permanent [...] process of change in the ways in which different groups in rural society—and some outside it—gain access to the products of their own or others’ labor, based on their differential control over production resource” (1989, p. 20). The differentiation process then unfolds petty commodity producers, which are both capitalist—as they control land as a means of production, and workers—because they use their labour inside or outside their land simultaneously.

To elaborate on how simple reproduction is being destroyed and subsumed into capitalism, Bernstein (1979, p. 426) investigated “[...] the ways in which capital attempts to regulate the condition of peasant production (as well as exchange) without undertaking its direct organization.” The analysis was done by investigating the social reproduction of rural households on how and to what extent they become dependent on the capitalist market and how it interplays with state projects. The investigation also implies inquiry into the divisions of labour, the mechanism of surplus labour appropriation, and the realization of the surplus product while situating the state’s role in these processes. The investigation summarized by Bernstein (2010a) agrarian political economy questions: Who owns/controls what? Who does what? Who gets what? What do they do with what they got? Bernstein (1979) also emphasizes that the environment also contributes to the transformation, albeit it similar to the thesis of Metabolic Rift (See Foster, 2000) whereas land exhaustion is the main phenomenon of capitalist agriculture and, as assumed within Marxist, it can be counteracted as productive forces are forever developing (Bernstein, 2010b). However, Blaikie (1985) highlighted the impact of class dynamics and rural surplus appropriation for industrialization on environmental degradation. It also gives a path to the insight of technological progress introduced to agriculture to encounter the natural limitation of extraction.¹⁰

Globalization, imposition of productive farming through state-led development, and green revolution swept Indonesia in the New Order regime, implying the presence of the capitalist market within rural agriculture. It means that those processes subject the peasant reproduction to the capitalist market, and now they are reliant on and operate under the capitalist market discipline (See Habibi, 2014). Therefore, as Bernstein (2006) argued, rural agricultural producers and the dynamics that occurred are not a question regarding the incorporation of the peasantry (which is characterized by subsistence farming) into capitalism but rather a question of labour, especially labour process. He termed classes of labour to produce surplus indirectly through agricultural farming or wage labour. Then we face the problem of “how classes of labour in global capitalism [...] pursue their reproduction, that is, through insecure and oppressive [...] wage employment, often combined with a range of likewise precarious small-scale farming and insecure ‘informal sector’ [...] subject to its forms of differentiation

¹⁰ This paragraph expanded version for ISS-4240 “Agrarian and Food Politics” First essay (Prawiranegara, 2023b)

and oppression along intersecting lines of class, gender, generation, caste, and ethnicity” (Bernstein, 2012, pp. 250–251). And to return to O’Connor (1988, p. 17), in the struggle to reproduce the conditions of production (changing biophysical conditions, introduction of commodities, policy changes etc.) “[...] constitute the immediate object of social transformation [...]” which is “[...] the material process of reproduction of production conditions [...] and the production process itself [...].” Or to use wording within the agrarian political economy, “[...] rural production process, agrarian accumulation and rural politics have ecological dynamics [...]” (Akram-Lodhi and Kay, 2010, p. 269)¹¹

Natarajan et al. (2019) and Natarajan (2021), through labour geography’s main tenets of labour as a spatial agency in the landscape, explore how petty commodity producers (PCP) in their responses towards the changing landscape due to ecological change and deterioration of social reproduction from land. Emphasis on the logic of labour and capital of PCP, Natarajan (2021), inquiry on the response of tobacco farmers in the event of drought and access to irrigation. Natarajan et al. (2019) focus on the displaced PCP due to commodification, pests, and debt trap to wage labour for the kiln. The focus for Natarajan et al. (2019) is the drive to return to land for these displaced workers and how wage labour acts as a temporal fix to sustain their social reproduction from land. However, both article focuses on the temporal domain of their response to the changes without further questioning the history of the specific configuration of biophysical conditions, social reproduction and structures necessary for productions (social and physical infrastructure) through which unfold the present configuration of the landscape.

2.3 Methods of Collecting Data

This paper deploys the qualitative method as White (1989, p. 20) stated that “[...] differentiation processes are thus essentially qualitative rather than quantitative [...].” Moreover, qualitative research “[...] stresses on the way of people interpret, and make sense of their experiences to understand the social reality of individuals [...]” could help the understanding the “[...] social world in which we live, and why things the way they are” (Mohajan, 2018, p. 2). To that end, data collection was done through three series of fieldwork, which was conducted in 2019-2020 and 2023 with the additional usage of satellite imagery data retrieved from Landsat and Sentinel to inform the physical geography of the area with the additional documents to understand the colonial history of the place.

The fieldwork in 2019-2020 was conducted in ethnographic-oriented fieldwork, which involved participant observation and semi-structured interviews. During the fieldwork, I mostly stayed in the neighbourhood in the east Babirah River, where I live in a household owned by a person who engages in logging activity as a paddy and palm oil farmer. Because the place is also a meeting point in the neighbourhood, I usually attend a range of discussions, from casual to serious ones. During the stay, which ranged from mid-December 2019 to early February 2020, I participated in their daily lives, such as planting paddy, checking the palm oil trees, and buying necessary goods from Samuda using boats. My other time was used to move around the village to interview people, which ranged from oil palm farmers, oil palm intermediaries, rice farmers, coconut farmers, communities utilizing forest products, farmers guided by REDD+ projects, village government, and local indigenous leader. The fieldwork was conducted during my tenure at the Agrarian Resource Center (ARC) as a researcher in the project to provide a policy brief to strengthen the smallholder palm oil in Indonesia. At the time, we were encouraged to have questions on our own before doing

¹¹ This paragraph is expanded version for ISS-4240 “Agrarian and Food Politics” Final Essay (Prawiranegara, 2023a)

fieldwork. Therefore, I conducted both activities of collecting data for policy brief and research. I wrote a personal, non-published, article about the context of Bapinang Hilir, and part of it will be used in this thesis. The reason for my inability to publish it is due to the lack of connection and money to hire a translator or submit it to academic journals. As I had a plan to do a master's degree, I intended to keep the article as a source for my master's thesis. During my stay in the village, I always mentioned that I am a researcher from ARC doing research to understand peatland agriculture, its social history, palm oil, and ecological change. The data collected during the fieldwork includes photographs, daily notes, and recorded interviews.

The 2023 fieldwork was conducted by a hired research assistant, Muhammad Fikri Fauzi (Pace), who is an ARC researcher who went to Bapinang Hilir for one month. Pace is an Agrarian Resource Center researcher who had a similar education as me before doing the internship. Before fieldwork, we undertook a series of discussions on my thesis's theoretical framework, fieldwork terms, expectations, and guide for interviews. During the stay of fieldwork, they informed the local leader of their purpose of research, including thesis purpose and Pace's purpose of self-research. The method is similar to what I was doing in 2019; those are participant observation and informal and semi-structured interviews. Most of the time, Pace stays with a similar household as I did during past fieldwork. The data collected was recorded interviews, photographs, and daily notes. As with the traditions of ARC, I clearly stated that I was not monopolizing the data collected so the organization and Pace himself could use the data collected for further research or campaign purposes.

The other type of data is GIS data which, if it was related to the satellite imagery, I retrieved from earthexplorer.usgs.gov for Landsat, dataspace.copernicus.eu for Sentinel 2 data, and firms.modaps.eosdis.nasa.gov for MODIS from NASA for fire hotspots. The data that I used comes from Landsat 5, 7, and 8 and Sentinel 2 L1C data. Other than that, for example, data about the administrative border, concession, state forest boundaries, and types are retrieved from Jaringan Kerja Pemetaan Partisipatif (JKPP, in English: Indonesian Community Mapping Network), Global Forest Watch and OpenStreetMap retrieved in 2020. Because the satellite data was shown only to give the context of land use change qualitatively, only Radiometric Calibration was used (See Howari and Ghrefat, 2021). The satellite imagery processing for this thesis is only splitting data to limit the area of focus and using open-source QGIS (QGIS Development Team, no date).

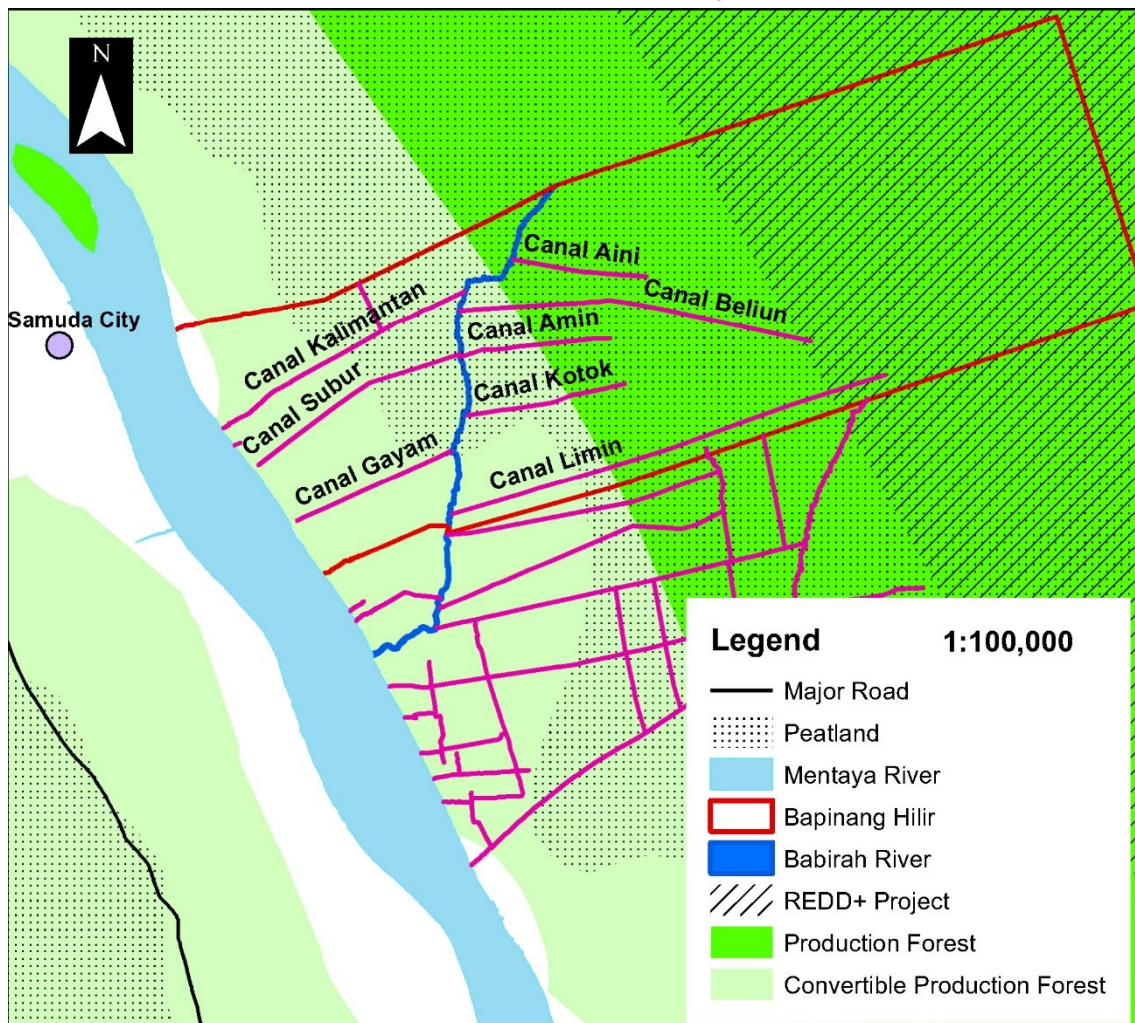
Chapter 3

The people and peatland

Bapinang Hilir Village, Pulau Hanaut District, Kotawaringin Timur regency, Central Kalimantan Province, located downstream of the Mentaya River, which imply that the village is affected by tidal waves. Its location on the eastern bank of Mentaya River made it flanked the Katingan River, thus making it the place where peatland formation is ripe due to being flanked by two rivers, each affected by the tide. The site does not have road access from its provincial capital city, Sampit, as it is only available to the western bank of the Mentaya River and there is no bridge to connect Sampit to Bapinang Hilir. Thus, to access the site, one must stop the vehicle in Samuda and cross the river using a boat. The only type of vehicle that can be carried across the river is motorcycles. Therefore, transport for people and logistics (including agricultural goods) towards the city uses boats. Due to the extensive canal system, agricultural plots can be reached by boats when the tide is high, which occurs once a day. From the agricultural plots, the goods are collected and then transferred by boats to Samuda for 30-90 minutes or Sampit for 90-180 minutes.

Map 3.1

Map of the Structure in Bapinang Hilir



Source: Jaringan Kerja Pemetaan Partisipatif (personal communication, 15 June 2020) and OpenStreetMap.org

The landscape of Bapinang Hilir is predominantly a state-designated production forest, which implies that the land does not have a conservation function indifference to “conservation forest” or “protected forest” (See Map 1.1). Instead, its function is an economic exploitation of forest products, which requires a permit from the provincial and central government to retrieve a concession. Other than the designated functions are banned, residential and agricultural uses are considered encroachment of the forest and access that requires legal standing for land ownership (procuring subsidy and government-certified seeds for agricultural plants) is nullified. In the history of Bapinang Hilir, there are only two forest-related concessions: logging concessions (1974-1999)¹² and ecosystem restoration (carbon trading) concessions (2015-2075).

The presence of people within state forests can be traced to the colonial legacy of the Indonesian forestry regime. The regime can be traced to the colonial period when the Dutch administration implemented the Forest Exploitation Law of 1865 (*staatsbad* No. 96), which declared all unclaimed forest lands as the domain of the state. During the colonial period, it focused on the islands of Java and Madura. Further, post-Indonesian independence, the practice was replicated through the Basic Forestry Law of 1967, which applied to Indonesia-wide territory. The law stipulates that land in areas without clear land has the right to be appointed as forest. Thus, the administration at the time arbitrarily appointed 70% of the Indonesian landscape as a state forest, further divided into five categories based on its function: production forest, protected forest and conservation forest. The law was done to further accelerate the exploitation of, at the time, readily available and easy-to-extract timber. However, it is common that within the state-designated forest—as it is in Bapinang Hilir, people already settled long before the law was enacted in 1967 (See Peluso, 1988; Bachriadi, 2010).

As Bapinang Hilir composed of Peatland formed between Mentaya and Katingan River, itself (peatland) is a type of soil composed of undecomposed organic matter due to waterlogged conditions and they have been accumulated for hundreds of thousands of years for a meter thick peat. According to the International Union for Conservation of Nature (IUCN), tropical peatlands are the largest natural terrestrial carbon store. Due to its carbon stock, emission from degraded peatlands is one of the major sources in Agriculture, Forestry and Other Land Use categories. The peatland also contributes to the human activity living in it or nearby by providing safe drinking water, transportation, irrigation and a source of proteins. In Bapinang Hilir, majority of the land is peatland as it encompasses 80% of the village with most of them being used as paddy field, followed by palm oil, coconut and rubber smallholder farm (see table 3.1).

Table 3.1
Percentage of Mineral and Peatland in Bapinang Hilir.

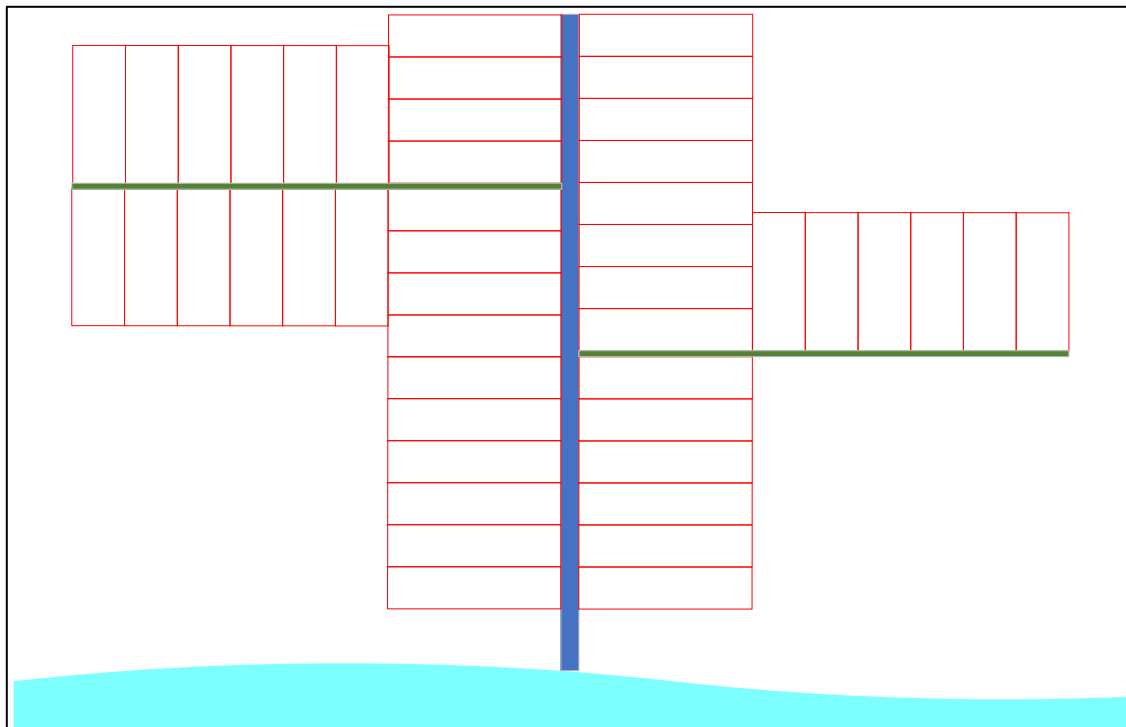
Land use	Percentage of land in Bapinang Hilir	
	Mineral land	Peatland
Housing	0.9	
Paddy field	-	41.6
Rubber trees	0.6	2.6
Coconut trees	15	3.3
Palm oil trees	0.1	8
Forest	-	28

Source: BRG (2019, p. 22).

¹² See Casson (2001)

3.2 Land Tenure

Figure 3.1
Land tenure by canal in Bapinang Hilir.



Source: Fieldwork 2020.

Description: Light blue is a river; dark blue shows canal, while green is secondary. Red coloured boxes are 1 sheet of land.

Land tenure in the Bapinang Hilir area is based on peat canals, or in the local language called *handil*, made to dry peatlands that allow agricultural land cultivation activities. Most canals were opened after independence by families who settled on the Mentaya River coast. Community members who opened canal and their descendants become canal rulers who can determine who can work on and manage transactions on land. Newcomers and community members entering the productive age must ask permission from the leading figure to be able to manage a sheet¹³ of land. If they have obtained permission, the canal will be extended based on the openings¹⁴ specified by the canal ruler (canal illustration can be seen in Figure 3.1). Canal length can be seen as the extent of individual land tenure in Bapinang Hilir.

Growing rice, fishing and utilizing forest products are the main occupations of people in Bapinang Hilir. Farmers start to plant rice at the end of the dry season. When the rain started to fall, farmers put a block on the canal so that water could flood the rice plants. In rice production activities, almost all farmers work in their respective fields. If there is a lack of labour, they can mobilize wage labourers even though the wages are quite high. No share-cropping schemes or land leasing are found in rice cultivation there. Accumulation of production with land expansion for rice cultivation is relatively difficult due to labour shortages and high wages. The monopoly of technology mastery that can increase production efficiency - such as using tractors, threshing machines and water pumps - develops along with the difficulties of land expansion for rice cultivation. Land expansion through purchasing or

¹³ The term sheet describes one lot of land owned, and almost all the land on Hanaut Island is rectangular.

¹⁴ The intended opening refers to the width of the land opened.

opening new land to plant cash crops such as coconut, rubber and (now) oil palm, which relatively does not require intensive care and labour, is a very rational choice for local farmers who have enough capital to accumulate.

Planting coconuts at an early stage - clearing and preparing land - requires a significant amount of money, especially for the supply of herbicides and labour mobilization (see Table 3.2). The time lag until the coconut plants produces fruits that can be harvested is also long, about eight years. Moreover, harvesting can be done every four months. The long vegetative period makes farmers need another source of income for consumption before their coconut plantations can produce. Conversely, harvest time intervals imply that the labour needed to be mobilized is low. Therefore, coconuts are the most favourable commodity for rich farmers.

Compared to other places in the downstream area of the Mentaya River, oil palm is relatively newly planted in Bapinang Hilir (only since the mid-2000s). The initial capital needed for oil palm plants is smaller than coconut because it does not require raised beds in land preparation (see Table 3.2). The waiting period before harvest, which is also shorter (5 years) and a faster harvest interval (3 weeks), makes the oil palm head a popular crop. Now, the largest oil intermediaries in Bapinang Hilir can receive 50 tons of Fresh Fruit Bunches (FFB) at one oil harvest interval. However, oil palm farmers in Bapinang Hilir since 2016 have been faced with conservation issues, one of which is to reduce the expansion of oil palm plantations (Suryana and Habibie, 2020).

The long experience of residents in Bapinang Hilir and surrounding areas in managing land preparation makes them have an 'arrangement' and procedures for how shrubs are burned so that the fire does not spread.¹⁵ The land preparation process forms a specialization of work that led to the work of guarding the fire at the boundary of the land to be burned as well as the work of protecting the land from the blaze. In addition, the people who control the land planted with hard plants also mobilize labour to guard against fire, especially during the southeast monsoon. Land fires, the fire which spreads out of control, generally occur because the land is left over or not tilled by the owner of the land.

Residents and especially farmers in Bapinang Hilir and surrounding areas really understand that there is a risk of land fires that are very easy to spread on peatlands, especially if they are working on coconut and oil palm plantations which require very large capital. Widespread land fires can also potentially eliminate the plants that become their source of income. Drying the land by burning land and the remnants of trees that have been cut down become part of the process of preparing land for agricultural activities. To plant rice, even the drying and burning of land are regularly conducted following the planting season, which is every beginning and end of the planting period. This fire is well controlled to prevent the fire from reaching perennial crops such as coconut and oil palm. Meanwhile, ash from the fire results into fertilizer for plants that will be grown later (Watson, 1984; Carmenta *et al.*, 2021).

Table 3.2
Initial capital and labour costs for planting oil palm, coconut and rice per hectare

Plant	Activity	Component	Cost
Rice*	Shrub clearing	Systemic Herbicide @5 Liter	Rp375.000
		Contact Herbicide @10 Liter	Rp750.000
		Wage for Herbicide spraying	Rp675.000
		Wage for grass cutting	Rp1.400.000
	Plantings	Wage for planting	Rp1.200.000

¹⁵ For comparison, see also Dove (1983) which presented a very detailed description of land burning techniques used by Dayaks in West Kalimantan in preparing agricultural lands.

	Total		Rp4.400.000
Coconut	Shrub clearing	Systemic Herbicide @5 Liter	Rp375.000
		Contact Herbicide @10 Liter	Rp750.000
		Wage for Herbicide spraying	Rp675.000
		Wage for grass cutting	Rp1.400.000
	Land preparation	Wage for creating beds @7 line	Rp14.000.000
	Planting	Wage for planting	Rp1.625.000
	Total		Rp18.825.000
Palm Oil	Shrub clearing	Systemic Herbicide @5 Liter	Rp375.000
		Contact Herbicide @10 Liter	Rp750.000
		Wage for Herbicide spraying	Rp675.000
		Wage for grass cutting	Rp1.400.000
	Land preparation	Wage for ditch creation @3 lines	Rp2.400.000
		Wage for aligning the plant line	Rp500.000
	Plantings	Wage for Plantings	Rp1.625.000
	Total		Rp7.725.000
Notes:			
The table provides the cost expended at initial plantings (initial capital), not a periodic cost.			
*Case of planting rice without burning the shrub and must be repeated each planting season.			

Source: Field notes 2020.

Chapter 4

Traces of the Colonial Past and transformation

This section will delve into the history of Bapinang Hilir from the onset of the first migration until the completion of the second canal dredging in the 2000s. It will briefly explain the configuration of Banjarese migration to Bapinang Hilir and the presence and development of smallholder agriculture in the early-20th century. It is assumed that due to the migration, trade and dominance of cash crops, commodification is in gear at the start. Following the era of the New Order (1965-1998), the differentiation of classes intensified due to the combination of canal dredging preceding the ecological change and the presence of a logging company, which PCP leveraged as alternative social reproduction. This chapter hitherto laid the landscape configuration which will come after the fire of 2015.

Moreover, there are cases in which PCP seek to configure their landscape to make sure of their social reproduction. It was at the beginning of the migration period when most of the inhabitants were displaced population from the Banjarmasin War and labourers being brought to work on the plantation. These people settled down in the area downstream of Mentaya River, which is now called Samuda and Pulau Hanaut, to dig a canal or open the agricultural land in the existing canal. Furthermore, later, in the onset of impact post-canal dredging where an acidic layer of peat was exposed, thus disturbing the cultivation (Also see Pantau Gambut, 2023), PCP went to the forest and sold the timber to the concession holder.

4.1 The Colonial Past

The Banjar War, which began in 1859 and ended in 1904, represents an important moment that transformed the Sampit area and South Kalimantan. It dissolved the Sultanate of Banjarmasin and expropriation of the land from the resisted indigenous to the Dutch East Indies. The war itself was initiated due to a succession crisis internally and a desire to control coal reserves in the sultanate areas. It resulted in instability in the area, which led to many Banjarese people migrating, with Singapore and Sampit as common destinations (Ven, 1860; Meyners, 1886; Kielstra, 1892). In the mid-19th century, coconut-derived products became global commodities, with the resulting oil being used for margarine, soap, and cooking oil (Heersink, 1994; Asba *et al.*, 2020). Banjarese learned that coconut, rubber, and rice could be grown on peatland through canals from agricultural practices in Singapore (Lindblad, 1986; Furukawa, 1994). In the late 19th and early 20th, the southern Mentaya River emerged as a destination for migration and a small port for exporting commodities, primarily to Singapore. On these newly acquired lands, Banjarese excavated small canals known as “handil” to facilitate the cultivation of coconuts, rice, and rubber (Westhoff and Wijk, 1884; Lindblad, 1986; Darmadi, Yusriadi and Maulana, 2017).

Following the implementation of liberal agrarian law in 1888 in Kalimantan (Gouverneur-Generaal 1889), large plantations for rattan, coconuts and rubber controlled by a concessionary holder were established in the area (Departement van Binnenlandsch Bestuur, 1915). It then followed up by the opening of shipping routes by the Koninklijke Paketvaart Maatschappij alongside routine ships from the Malay Peninsula, Java and Madura routinely docked at the port of Sampit (Koninklijke Paketvaart-Maatschappij, 1910; Yogaswara, 2012).

These ships not only transported commodities but also brought labourers who primarily worked in the coconut and rubber gardens owned by the local populace, as well as in rubber

plantations.¹⁶ Referring to Lindblad's (1986), many Banjarese worked as labourers on plantations and learned farming techniques, then later applied them independently on their farms (Lumholtz, 1920, p. 314; Eisenberger, 1936, p. 36; Darmadi, Yusriadi and Maulana, 2017, p. 48). Migration during the early 21st century was generally composed of individuals who became settlers and engaged in agriculture in the downstream Mentaya River area. The downstream Mentaya River area was densely planted with coconut and rice crops, particularly in the region referred to as the Koerts (1937) as the Semoedacomplex—or Samuda in the present day (see Map 4.1). Coconut trade was predominantly conducted by Banjarese and Madurese individuals who transported these coconut commodities to both Singapore and Surabaya. Because this was a peatland region, land ownership was based on canals, with the family who first opened these canals holding and retaining authority over the land along the canal banks (Koerts, 1937, pp. 58 & 75). In this period, coconut smallholders expanded across the bank towards the Bapinang Hilir area (Interview, 28 December 2019 and 29 January 2020).

Map 4.1
Southern Mentaya in 1914 (left) and 1936 (right).



Source: Topographische Inrichting (1914) and Koerts (1937).

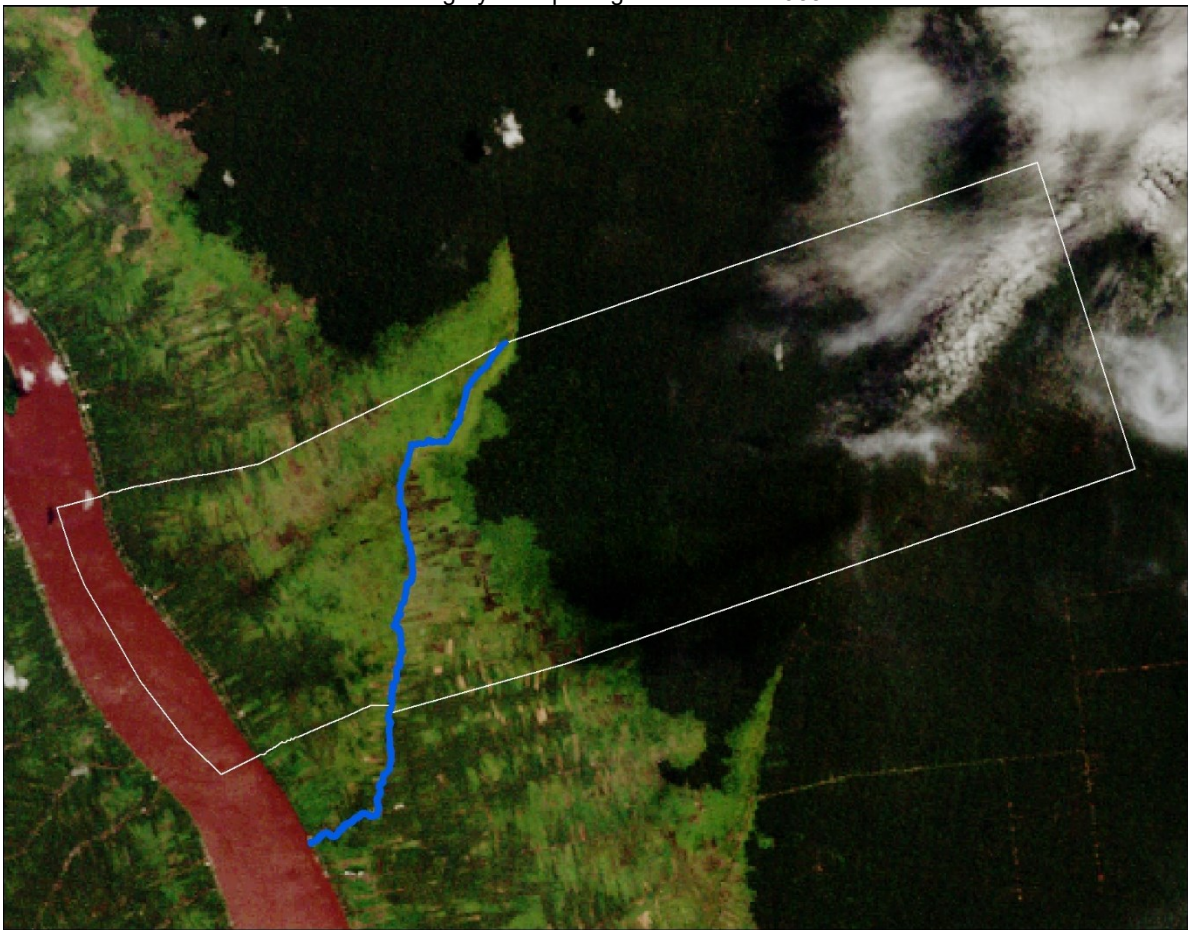
4.2 Changing Configuration

The first tidal swamp irrigation project departed from the Central Kalimantan Regional Spatial Structure Plan in 1992, which stated that the tidal land would be a target for developing paddy fields to support national food production (Pemda Kalteng, 1995). The tidal

¹⁶ Hilkie was the first to establish a large-scale rubber plantation in Sampit, where production labour, including administrative personnel, operators, labourers, packing staff, and transportation workers (Yogaswara, 2012).

swamp irrigation project in Kotawaringin Timur is an inclusion project undertaken by the local government as part of the One Million Hectare Peatland Development Project undertaken by the Central Government (McCarthy, 2013). However, other local governments, including Kotawaringin regency (at that time, still Kotawaringin), initiated similar projects on a smaller scale through the tidal swamp land irrigation or what is now referred to as the Peat Canal Project. The project being able to be presented in Bapinang Hilir is due to the lobby from the Pulau Hanaut district to the personnel in Kotawaringin Regency. The project began by forming a farmer group consisting of people who lived around Canal. Then, the land was cleared to be used as a path for extending canal and marking the land of group members. The process of distributing land resulting from canal lengthening was determined by the controller of the canals (Interview 28 December 2019 and 3 January 2020).

Map 4.2
Satellite imagery of Bapinang Hilir taken in 1988.



Source: Landsat 5.
Description: Blue colour indicate Babirah River and white for Bapinang Hilir.

It is important to note that in Bapinang Hilir, there is no mechanism for land leasing or sharecropping scheme for rice in place, and the limited work hours within a single family (usually, rice cultivation was handled by women), PCP was unable to accumulate land through rice cultivation. The cost of planting coconuts and the long waiting time for the trees to bear fruit made coconut cultivation economically unfeasible for them. At the time, usually, the division of labour was women planting the rice and men will collect timber, fishing or hunting in the forest. It was the unavailability of capital and labour that made it difficult to plant coconut. Moreover, options to let the land as investment was not possible as well, as when the land was not being used, it would become the source of pests and fire, destroying the vicinity of rice or coconut. Ultimately, when the dredging commenced, the pyrite layer

exposed to the acid would leech into the paddy field and hamper the growth and harvest of the paddy (Interview, 31 August 2023).

When PCP was given land, they were faced with a lack of labour to work on it and capital to invest in it. Additionally, the land cannot be left uncultivated as it will attract the pest and become a source of fire. It is exacerbated by the acidity of the soil post-dredging, which made it more difficult to gain from expanding more labour power into rice cultivation. Then, the logic to increase wealth or sustain social reproduction is only from the timber, which the presence of a logging company enabled it to do.

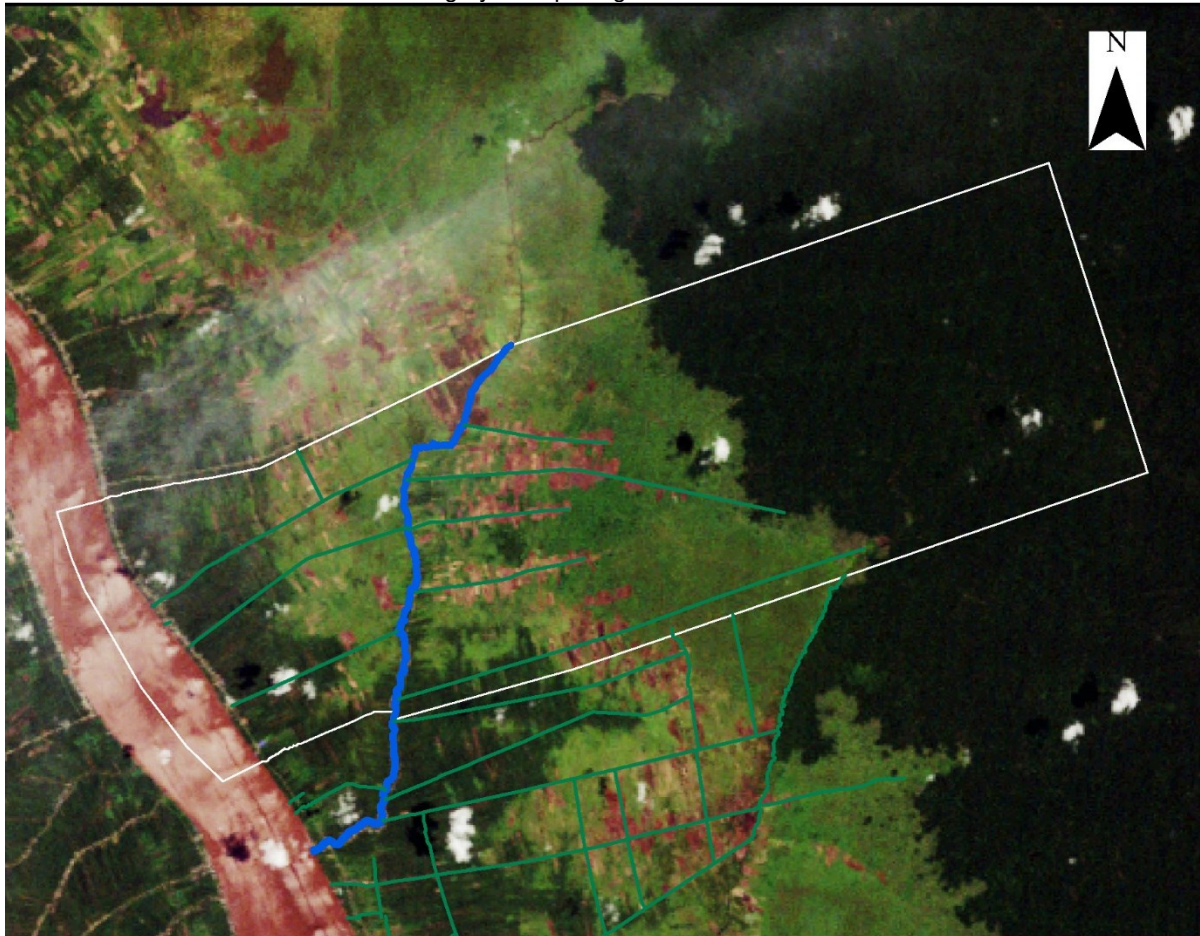
The timber company is PT Mentaya Kalang, which controls 4.2 million hectares across Kotawaringin Regency (Casson, 2001). The company could do so because the New Order relied on the timber sector to jumpstart the economy. New Order, through Basic Forestry Law, introduced the term "State Forest" and utilized it to attract investments for capital accumulation in the forestry sector. It took the form of granting large-scale land ownership in the form of Forest Management Rights and Industrial Timber Plantations in Production Forest Areas. Consequently, this created a condition of the first large-scale land ownership by timber corporations in East Kotawaringin Regency. Concessions for forest exploitation in Bapinang Hilir began with PT Mentaya Kalang, which obtained its concession in 1974 (Casson, 2001). The company began expanding into the Bapinang Hilir region in 1987 by constructing a wooden railway to transport timber logs from the forest to the Mentaya River in the village of Babirah (adjacent to the village of Bapinang Hilir). At that time, the residents of Bapinang Hilir were invited to engage in the logging of Ramin wood and sell the timber to collectors, who would then send it to PT Mentaya Kalang. To become a wood intermediary, one needed boats and access to PT Mentaya Kalang's wood processing facilities in Sampit (Interview 28 December 2019).

In that period, configuration, preexisting structures, biophysical conditions and infrastructure for logging made possible a deeper agrarian differentiation. The logic of accumulation from those who control the land materialized in the canal dredging project from the government, which drove ecological change by exposing the pyrite layer beneath the peat, thus acidifying the soil and making it harder to plant rice. Albeit given additional lands, the structural conditions of lacking labour made the schemes such as sharecropping or land leasing for paddy and the high cost of planting hard crops made it difficult for PCP to utilize the newly acquired land productively, either expanding paddy field or plant coconut. In these conditions, the availability of logging companies was being leveraged to increase their livelihood and secure self-reproduction, thus focusing on their family labour in the timber industry. Therefore, newly acquired land was sold to the same family who controlled the canal and invited the dredging project and then planted coconut trees (Interview 27 August 2023).

Post-reform, along with the government's efforts to address the issue of food scarcity, in the mid-2000s, the Kotawaringin Timur Regency government released a second tidal swamp irrigation project (Pemda Kotim, 2006). The canal excavation/construction project was carried out in almost all villages on Hanaut Island, including Bapinang Hilir. This program extended and deepened the canals that were dug in the early 90s and other canals throughout the village of Bapinang Hilir. The project scheme was the same as the previous tidal swamp irrigation project, which formed groups, pioneered canal paths, and divided land per sheet to group members. An important difference between the first and the second project was that the Village Head fully controlled the latter. Residents who wanted to acquire land or become part of the group must report and register with the Village Head of Bapinang Hilir. In addition, there were people - residents of Bapinang Hilir - who had a close relationship with officials of the Kotawaringin Timur Public Works Office who could help regulate the length of the canal, its depth, and determine the canals to be installed with floodgates (canal blocking). The person prioritized project work on the handle that he was controlled,

with the result that there was a difference in water level regulation technology in each canal (interview, 3 January 2020).

Map 4.3
Satellite imagery of Bapinang Hilir taken in 2008.



Source: Landsat 5 and Open Street Map.

Description: Blue colour indicate Babirah River, white for Bapinang Hilir and Green lines for Canals.

The first and second canal dredging projects transform the configuration of the Bapinang Hilir landscape. The formation of ‘coconut elites’ due to the expansion of agricultural land from the two projects sharpened differentiation. Their control of canals generates power on how it is being used politically. They are gaining positions as local leaders in the newly established Indonesian Republic as they are considered prominent figures. Putting the large farmers as prominent leaders is not a specific case. Instead, it is documented that those controlling large agricultural land in Indonesia’s agrarian setting became prominent figures (See Habibi, 2021). Furthermore, in their attempts to accumulate more land, in this case, exercising the power of their position in governmental office and riding through the waves of canal construction brought them back home to expand their own controlled canal.¹⁷ What was happening is that the canal construction changes the configuration of Bapinang Hilir. Tenuarial changes of land on the western part of Babirah River are now entirely privately controlled and parcelled. Thus, the communal land reserved for future migrants or family members is nullified.

However, following the canal expansion, not all the extent of land on the east was privately controlled; some parts of the land had still not been canalized, thus a common.

¹⁷ See Hall, Hirsch & Li (2011) for similar cases.

Extension and deepening of the canal entail the declining peatland water surface decline, drought, land fires and land subsidence. It led to the devastating impact of retreating tree lines due to peatland fires in the event of strong El Nino, like those in 1997 and 2015. Regarding the retreating tree line, AH said that it makes the need for labour to extract trees increase. Especially in the dry season and El Nino years, the dry canal makes rice cultivation difficult.¹⁸ It caused many agricultural lands on the western side of the Babirah River to be sold.

During post-canal construction, the unfavourable configurations for PCP led them towards timber commodity production. Both events entailed what has been focused on by Herod (2003) and Natarajan (2021) on how labour shapes their own landscape within the limitations of specific configurations to satisfy their social reproduction or accumulation. However, as a spatial agent, their actions leave an impact on the configuration itself. Opening canals and controlling them led to the formation of coconut elites, and their action later, canal dredging, heavily impacted the later configurations. For loggers, impacting on retreating forest canopy line, albeit fire made a most, and it (fire) negatively alters their capability in extracting timber.

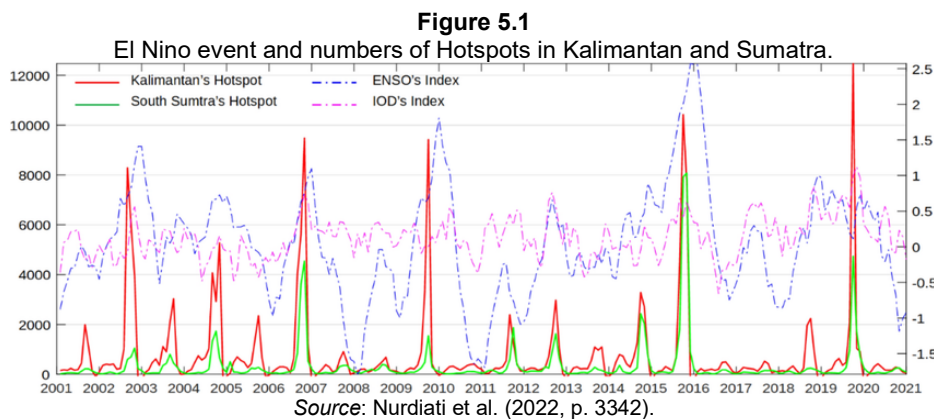
¹⁸ It takes about one month to make planting holes to put rice seeds in an area of about half a hectare. When the land is wet, it only takes a week at most.

Chapter 5

The Present Configuration

The One Million Hectare Peatland Development Project (PLG) exemplified the transformation of peatland development in Central Kalimantan and its associated small projects within the same province. Albeit it was discontinued post the fall of New Order in 1998, through the project, the government imposed itself, discarding the commonality of land from Dajak tribes and transforming it into cleared and readied parcels to be granted to corporations as a concession, mostly to palm oil companies (McCarthy, 2013; Li, 2015). With a large area cleared through PLG and reserved by state planners, adjoining by the palm oil boom in the 2000s, and decentralization of state management, which enabled local government to grant concession, Central Kalimantan became a new frontier for the oil palm industry. It is a change strategy from the logging-timber industry, which collapsed in 1999 due to the ban on log exports, towards a sweeping landscape covering palm oil plantations. By 2019, Central Kalimantan is now the most productive province (4.1 tons FFB/Ha) in oil palm cultivation and has experienced a 7-fold expansion of oil palm plantations since 2004 to 1.5 million Ha (BPS, 2008; General Directorate of Plantation, 2019). On the spilling project in Bapinang Hilir, extending the canal and dredging imply that lands that were once deposited for further generations, due to the limitations of rice plantings, now became parcelled and privatized, which, in the last episode, then concentrated by coconut elites, albeit later, their copra processing factory collapsed due to competition with palm oil.

Furthermore, peatland followed up afterwards, especially during the El Nino season. It is estimated that the peatland fire in 1997 is equivalent to 13-40% of global fossil fuels burning, and the fire in 2015 exceeded the emissions from the US economy in one year (Aldhous, 2004; Butler, 2015). In the 2000s up until 2020, generally, El Nino correlated positively with hotspot (fire) occurrence in Indonesia, especially in Kalimantan, where the correlation number is 0.69 (see figure 5.1) (Nurdiati *et al.*, 2022). Peatland fires are generally caused by draining the peatland due to the construction of canals, which are used for land clearing before plants can be cultivated (Suyanto, 2007). Palm oil plantations are then the entity placed as the main driver of peatland burning because of their increasing hectarage in Indonesia and mostly present in the sparse and flat land, which in Central Kalimantan is peatland (McCarthy, 2013). Furthermore, land clearing by fire is cheaper, providing a greater profit margin (Purnomo *et al.*, 2017).

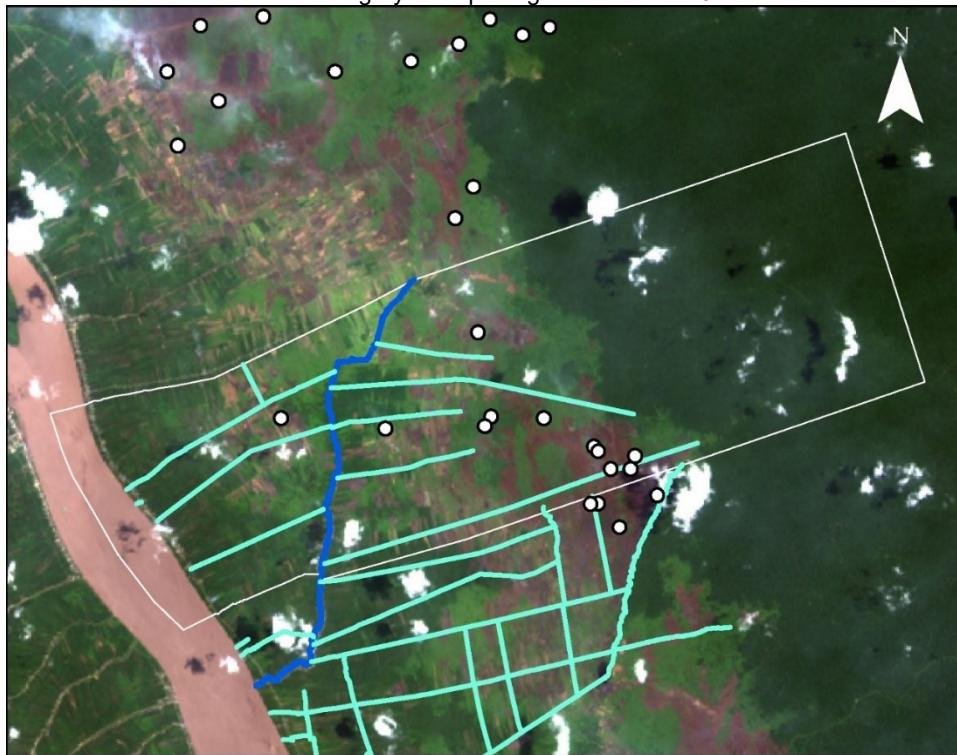


The 2015 fires (See Map 5.1 for Bapinang Hilir Area) released carbon emissions amounting to 692 million metric tons of CO₂ and 3.2 metric tons of methane (Huijnen *et al.*, 2016). The 2015 fires leading to health and economic disturbances and resulting in the destruction

of 2.6 million hectares of land. The extensive fires were believed to have originated from the burning of 100 thousand hectares of land in preparation for plantations and spread due to the El Niño effect (World Bank, 2016). Nearly half of the burnt land consisted of peatland, which is the largest carbon storage capacity on Earth (Harris *et al.*, 2015).

These fires prompted reactions and responses from various organizations and countries regarding changing land use and emission in Indonesia. Norway, which had promised 1 billion USD for emissions reduction from forests and land in 2010, pressured the Indonesian government to address the forest fire issue. The pressure from the Norwegian government led to the establishing of a peatland moratorium through Presidential Regulation 57/2016 (FT Investigation, 2016). Following the introduction of the moratorium, Norway provided 25 million USD grants to organizations to support the Indonesian government in implementing REDD+ (Norway in Indonesia, 2019). One of their activities involved strengthening the “Directorate General of Law Enforcement of the Ministry of Environment and Forestry” (Gakkum) to reduce illegal logging, burning, encroachment on forests and the establishment of the Peatland Restoration Agency (BRG).

Map 5.1
Satellite imagery of Bapinang Hilir taken in 2014.



Source: Landsat 8, MODIS, and Open Street Map.

Description: Dark blue colour indicates Babirah River, white for Bapinang Hilir, green lines for canals and white dots for 2015 Hotspots.

The carbon offsetting, especially in Indonesia, mainly falls within the initiatives of Reducing the Emission from Deforestation and forest Degradation (REDD) and for the peatland, usually combined with the initiatives of Wetland Rewetting and Conservation (WRC) and Afforestation, Reforestation and Revegetation (ARR). The combined initiatives, simplified as the REDD+ project, are “[...] another type of large-scale land allocation involving the injection of large capital investments into remote forest frontiers” (McCarthy, Vel and Afiff, 2012, p. 538). It implies controlling large swaths of land designated for production on certain capital circuits. For the case of nature, Fairhead et al (2012) explained it as a long attempt to commodify forests beyond timber, initially as Payment of Environmental Services, which provided incentives to the controller of the land to manage land for ecological

purposes. Furthermore, the carbon emission that was avoided by controlling a swath of land has been sold as carbon offset certificates in the market in the same mechanism as trading of a capital stock.

The previous configuration unfolded the context of ecological change. It brought the peatland fire, drought, acidification, and carbon business into the Bapinang Hilir areas. In the context of agrarian structure, canal dredging privatizes the rest of the land in the west of Babirah River, and most of the rest of the land in the east was granted as carbon concession, while most of the Bapinang Hilir is now under the REDD+ project. Political change post-reformation made the Kotawaringin Timur regency the center of the palm oil industry with the most hectareage of concession. This section will unpack these entanglements and how it further deepens the agrarian differentiations.

5.1 On so called REDD+

The REDD+ project, known as RMU, obtained its second concession located in Kotawaringin Timur from the Ministry of Environment and Forestry¹⁹ in 2016. At the same year they successfully received VCS (Verified Carbon Standard) verification and Triple Gold CCBS (Climate, Community, and Biodiversity Standard) verification which their avoided carbon will be credited from 2010 to 2070 (RMU, 2016). RMU was established in 2007 with the idea of creating a new business model based on forest conservation in Indonesia that could generate profits through carbon trading (Butler, 2013). New RE concessions were granted by the Ministry of Forestry in 2013 and 2016, covering a total area of 149,800 hectares (see Map 1.1).

RMU's core business involves selling greenhouse gas (GHG) emissions reductions from its peatland environmental services, which have been verified by the Voluntary Carbon Standard (VCS) in the form of Verified Carbon Units (VCU) certified by the Climate, Community and Biodiversity Alliance (CCBA). The calculation of GHG emissions reductions from peatland is based on the total concession area obtained, which is 149,800 hectares. However, the entire project zone area verified by VCS and CCBA is 305,669 hectares (RMU, 2016). The VCS certificate for the carbon traded by RMU includes a requirement to ensure that the project does not have a negative impact on the local community and encourages local community participation in project development and implementation processes (Verra, 2019). On the other hand, the CCBS certificate is evidence that the project will undertake activities that enhance the well-being of the communities within the project zone. This evidence is calculated by comparing the well-being scenario of the community without intervention activities to the well-being after the intervention (CCBA, 2017). The CCBS certificate in carbon trading can increase the valuation of Verified Carbon Units (VCU) to \$3.9/tCO₂e from just \$2.3 (Hamrick and Gallant, 2017).

The total VCU that can be sold while RMU holds the concessions in Katingan and East Kotawaringin reaches 447,110,780 tCO₂e, potentially earning \$1.7 billion USD over the 60-year concession period. This calculation does not include income sources from grants and the extension of the RE concession period for an additional 35 years. The VCU figure is based on the total calculation of greenhouse gases from peatland protection within the concession, covering deforestation and forest degradation, peatland conservation and rewetting, afforestation, reforestation, and land revegetation within the concession, as well as risks in

¹⁹ Through the Decree of the Head of the Investment Coordinating Board on behalf of Minister of KLHK SK 23/1/IUPHHK-RE/PMDN/2016 covering 49.620 ha and Decree of the Minister of Forestry of the Republic of Indonesia SK 734/Menhut-II/2013 covering 108.225 ha. The project is granted 60-year license and can be extended to 100 years (RMU, 2016).

buffer areas outside the concession (RMU, 2016). Risk prevention in the buffer zone and control over community activities is necessary to meet the CCBS targets (Sunderlin and Sills, 2012), making RMU a significant stakeholder in Bapinang Hilir.

5.2 Restriction and Fire

It is important to note that since the New Order regime came to power in 1965, it assigned vast areas to be state-designated forests, including Bapinang Hilir, in which almost all land in the village area was designated as state forest (See Map 1.1). It implies that any economic activities other than **permitted** forest-related production (timber and non-timber as a concession from the state) are prohibited or at least not recognized by the state. Therefore, villages' economic activities are illegal, and the agricultural assistance provided by the state was harder to reach there, except for the local village government, which has limited funds and is controlled by the coconut elite. It is also implied that legalizing control of land—which is mostly part of the palm oil-related aid and certification, was increasingly difficult, especially after 2015 and 2019 when strong El Nino hits, and peatland fires occurred when forest law enforcement agencies became more aggressive in the Bapinang Hilir.

Since 2019, the Directorate General of Forest and Land Fire Law Enforcement of the Ministry of Environment and Forestry (Gakkum KLHK) has started operating in Bapinang Hilir. The team from Gakkum KLHK conducts patrols socializes criminal threats for land burners, and there is a board prohibiting entering the land. The existence of these activities discourages farmers from entering the canal on land for fear of being considered forest burners if there is a fire²⁰. This leaves the land abandoned during the dry season, making it difficult to control the fire once it has burned and caused the land to catch fire. However, Farmers who have been on the RMU firefighting team can still enter the farm if they wear a uniform. Other farmers who were not on the firefighting team preparing rice fields burned their fields early in the morning to avoid being caught (Interview, 17 August 2023). Another strategy to avoid being caught, especially for farmers who have never been in a firefighting team (do not have uniforms), to prepare their land when entering the rice planting season is to enter the land and burn the fields in the morning. The remaining alternative for farmers to clear agricultural land, besides burning land, is to use 15 liters of herbicide for each lot of land, which costs 1 million rupiahs. The high costs of rice production and ecological changes make rice farming land decline, largely abandoned and sold. Since there was a RMU project, relatively only fields that were not within the project area could be accessed - either openly or secretly - by local farmers for farming activities.

5.3 Palm Oil Farming

Oil palm plantations in Bapinang Hilir did not occur due to plantation companies. The emergence of oil palm in this village began around the early mid-2000s when farmers planted oil palm along the Samuda-Sampit road. TBS traders-middlemen who normally operated along the "sawitan area" of the City of East Waringin Regency - the road that connected Pangkalan Bun-Sampit-Palangkaraya-Banjarmasin which, since the New Order era and intensified during the Reformasi era, has developed into a part of the palm oil trading chain in East Kalimantan (see Map 1.1f) - introduced and offered oil palm sprouts (seed) to farmers. Seeing that palm oil production was more profitable, the shorter period of immature plantations (5 years) and harvest intervals (3 weeks), two farmers in Bapinang Hilir gradually

²⁰ Of fearing 15 years imprisonment and/or 5 billion rupiah fine (see: UU 18/2013 about Prevention and Eradication of Forest Destruction)

switched to planting oil palm. At the same time, the coconut elite did not participate. They are more interested in cultivating swallow nests that are also experiencing a boom. Swallow nest business, despite its capital intensive and high risk of failure, also promises high profits and does not need large amounts of land and labour (Jordan, 2004; Thorburn, 2014).

Early farmers began planting oil palm in Bapinang Hilir in late 2000. At that time, there were only two people who began planting oil palm. Both also have motorized boats that can be used to send FFB directly to the intermediary on the Samuda-Sampit road. In the mid-2010s, conditions began to change, and the oil palm trees they planted began to bear fruit. One of the two early farmers - HMD - bought 4 hectares of dry land. Another early oil palm farmer - HD - succeeded in persuading one of the 'coconut elites' to finance him planting oil palm on 6 hectares of unused land in Subur Canal with a 50:50 profit sharing system from FFB production per harvest.

The Peatland fire in 2015 brought changes to the palm oil cultivation in the Bapinang Hilir. Non-palm oil farmers experienced loss and damage due to their land getting burned, as burned peat soil exposed the pyrite layer (called white soil by the people of Bapinang Hilir), which was potentially oxidized and exacerbated the acidity of the soil. Farmers needed to wait up to 3-4 years for the acid from the pyrite layer to be drained, which meant removing income from the land at that time. On lands where rubber and coconut plantations were burned, and layers of pyrite were exposed, the farmers suffered losses and lost sources of income from the lands. This condition made many of these lands sold at low prices, ranging between Rp. 1-5 million per lot. These lands were mostly bought by those HD and HMD, which made them able to control up to 8 and 16 hectares of land.

The durability of oil palm plants to bear fruit after a fire makes more and more farmers who have been cultivating rice switch to cultivate oil palm. The cost of cultivating rice also increased due to the prohibition of land clearing through burning. Oil palm then becomes the choice for most farmers because of the ease of obtaining seeds, the affordable cost of planting, and a short harvest interval (3 weeks). Residents who have relied heavily on their income from extracting forest products have also begun to plant oil palm on their lands, which generally only have 1-2 sheets of land because they considered the possibility of losing access to the forest by the RMU in the future. The more people change to palm oil, the more fortune will be generated for HMD and HD as now they are not only cultivating a large land of Palm Oil, but both also act as seeds, fertilizer and knowledge providers while also acting as intermediaries. Farmers who have capital can buy seeds directly from HMD or HD or take the seeds directly in both of their plantations. HMD also became a middleman of fresh fruit bunch of palm oil (FFB) produced by farmers with a margin of Rp. 300/kg (Interview, 24 August 2023).

5.4 New Palm Oil Farmer

Information about the types of oil palm, certified seedlings and how to obtain these seeds is not distributed among the people of Bapinang Hilir. The places to buy seeds are generally far from Bapinang Hilir as the closest one to Samuda is 100 kilometers away (Dinas Perkebunan Kalteng, 2021), and the needs of truck and boats to transport a three to nine month of palm oil plant make it more difficult. Access to seed sources in Bapinang Hilir generally comes from mobile vendors who sell 'fake seeds' for IDR 200,000 for 250 seeds. Mobile seed vendors claim that the seeds they offer are palm seeds from government or corporate plantations. The fact is that the seeds coming from them are mixed with seeds containing *Pisifera*, a variety that do not produce fruit.

Another alternative is to develop independent nurseries whose seeds are from the best trees. People who work on oil palm plantations also have the opportunity to take the

best *brondol* (falling fruits) from the company and plant them around the house. Farmers who do not have the capital to buy seedlings from sellers or neighbors can seek *brondols* that fall near the palm trees in other farmers' plantations and plant them independently. Even though farmers can choose the best tree as a source of seedlings, they are still not certified seeds. In fact, the source and type of seeds greatly affect plant growth, productivity, and the price of Fresh Fruit Bunch in palm oil mill.

Oil palm as a tree crop requires large capital at the beginning of cultivation and becomes a form of long-term investment for farmers. From the purchase of seedlings, nursery costs (procurement of polybags), purchasing liters of herbicides²¹ for land clearing three times a year, the wage of spray workers²², making trenches - especially for farmers who have capital - to drain the tide²³. If farmers do not have seeds that have been sown - for about one year - they can purchase from neighbours at a price of 15 thousand rupiah/tree. Farmers themselves usually make the oil palm planting route, but if they want to get the optimal plant spacing, farmers can mobilize ex-plantation labourers with a salary of 500 thousand rupiah for 1 hectare of land. Workers can also be mobilized to plant with a wage of Rp. 5,000/tree. To support the oil palm stems and root growth, for farmers who have capital, there is an option to make a pile at a cost of Rp. 8,000 / tree. In 1 hectare of land, the average oil palm planted reaches 125 stems. The newly planted palm trees are covered with pipes or roofs made of tin or plastic that are used to protect them from monkeys, wild boars, and rats. While waiting for oil palm to bear fruit for about five years and avoiding the growth of weeds on the same land, farmers can still cultivate rice as a source of income (See Figure 5.2).

Figure 5.2
Paddy field in the middle of palm oil trees.



Source: Fieldwork 2020

²¹ 10 liters of contact herbicide and 5 liters of systemic herbicide.

²² Workers' wages for spraying herbicide Rp 45.000/liter; or mobilize family members, both men and women, if they do not want to pay labour costs.

²³ Trenching usually employs Madurese people with a salary of 2.4 million rupiah per hectare of land (three trenches).

Peatlands require more fertilizer input because of its high acidity and lack of nutrients, and if the land has dried up, it exacerbates the quality of the land, which adversely affects the growth of oil palm. Limited capital makes farmers in Bapinang Hilir generally apply fertilizers to their oil palm plants only once a year (: 5 kg/hectare/year). There are only limited fertilizers available: Urea, NPK, salt and lime. Urea is the most common fertilizer used by farmers. The three fertilizers are government-subsidized fertilizers, which are usually given to coconut plants. Although the price is low, the availability of subsidized fertilizers is also limited. The purchase is illegal and is limited to a maximum of 5 kg at a price of 15,000 rupiah for Urea. If farmers want to buy more, they can buy non-subsidized fertilizer in Samuda at a cost of 350 thousand rupiah per 50 kg (Urea fertilizer). The rare application of fertilizers for oil palm is based on the pattern of fertilizing coconut, which is considered unnecessary to fertilize in large quantities. However, according to the best practice, the types of fertilizers for oil palm on peatlands at least need potassium, Urea, phosphate, dolomite, CuSO₄, ZnSO₄, borate and NPK compound fertilizer²⁴.

Unlike the small farmers, those who have large capital can apply fertilizers every three months: 1 kg for each tree. Occasionally, they apply Borate, which costs 460,000 rupiah per 25 kg. The problem of fertilizing and preparing land certainly has an impact on crop productivity. Well-prepared land and well-fertilized plants can reach a productivity of 16-19 tons/ha/year of FFB. On the other hand, generally, oil palm farmers in Bapinang Hilir can only produce FFB around 12 tons/ha/year.

Farmers who have recently converted agricultural land for food (rice) to oil palm usually plant oil palm directly on land without making trenches, tread piles and oil palm planting spacing. Planting is also conducted gradually, depending on the availability of capital to buy and raise oil palm seeds. Peatlands and pyrite layers that have a high acidity level need washing to reduce acidity and toxic minerals. This washing can occur quickly by utilizing variations in water levels arising from tides. Making trenches serves to drain the tides into the land, which will wash the peatlands. However, the cost of mobilizing labourers to make trenches is the largest capital component during the land preparation process. Only a few farmers who have large capital can spend capital, while the rest (especially ex-rice farmers) cannot afford it. As a result, their productivity is low.

Due to land conditions, most of the first oil palm trees planted in Bapinang Hilir (around 50%), although now 12 years old in 2019, have shown declining productivity, some of which do not even bear fruit. More additional capital is needed to cut down the unproductive palm trees and replace them with new ones. Whereas aid schemes such as the Smallholder Oil Palm Rejuvenation (PSR) program do not reach the farmers there²⁵.

5.4.1 PCP: Between Fire and Living

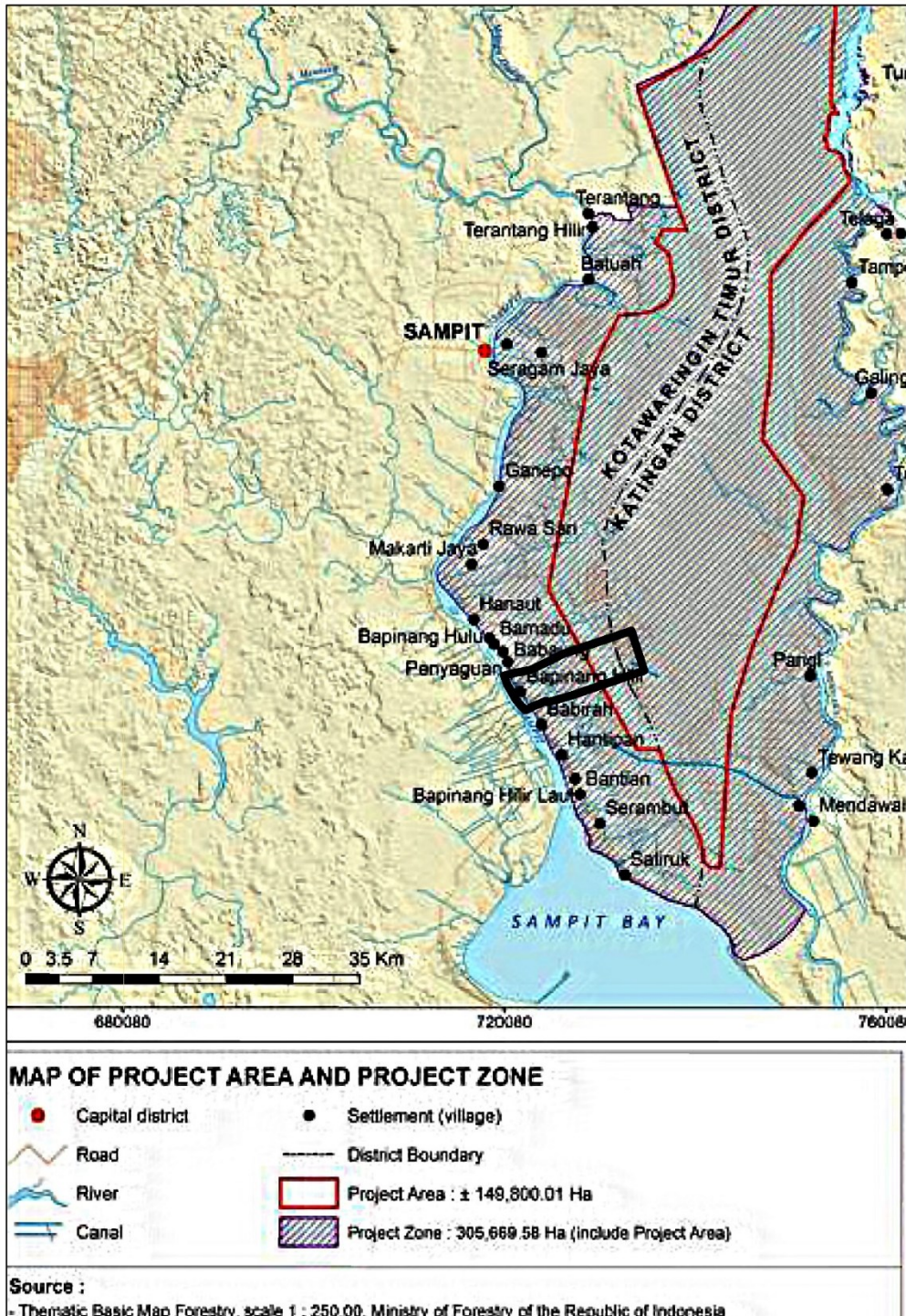
All land in Bapinang Hilir is formally included in the Production Forest Zone, both Production Forest and Conversion Production Forest. The position of the plantation in the Forest Zone has implications on the difficulty of obtaining legality over land tenure, both title certificates and land certificates. In addition, the oil palm plantations, which are placed

²⁴ See Regulation of the Minister of Agriculture of the Republic of Indonesia Number: 14/Permentan/PL.110/2/2009 on Guidelines for the Utilization of Peatland for Oil Palm Cultivation.

²⁵ The PSR program is financial assistance for replanting oil palm provided by the Palm Oil Plantation Fund Management Agency in the amount of Rp. 25,000,000 per hectare. See Regulation of the Minister of Agriculture of the Republic of Indonesia Number 03 of 2022 on the Development of Human Resources, Research and Development, Rejuvenation, as well as Facilities and Infrastructure for Oil Palm Plantations.

as the main causes of peatland fires and deforestation, are further complicating the issue of land legality. This difficulty is compounded by the inclusion of the Bapinang Hilir area into the REDD+ Project Zone by the RMU and the government.

Map 5.2
Area of REDD+ Project Zone and Project Area



The RMU is interested in reducing the rate of oil palm plantation expansion because it is considered to affect the ecosystem in their RE concession (IUPHHK-RE). In the VCU calculation, forest conversion carried out by farmers, mainly for oil palm, is one of the projected lands uses that will be prevented through the project (RMU, 2016; Devex, no

date). RMU encourages local farmers not to plant oil palm. Local residents consider it a ban on cultivating oil palm in Bapinang Hilir. On the other hand, information about the unclear boundaries of the RMU project concessions increasingly leads to uncertainty over land, and community ignorance has made it easier to control land tenure and land use by RMU. What has been done is encouraging communities to engage in sustainable agriculture through the provision of organic farming training and opening markets for coconut sugar or encouraging the implementation of the Social Forestry (referred to as PS) scheme (Interview, 10 January 2020)

Through the PS scheme, the status of the land as a forest area is strengthened, the community enters the environmental services business, and farmers are 'forced' to participate in regulating the types of plants that may or may not be planted in conservation logic. Because oil palm is considered to damage the forest, in the PS scheme, the palm oil planting is restricted and the existing one is severely regulated²⁶. However, government programs for oil palm farmers, such as counselling, granting access to production input, institutionalizing farmers, and rejuvenating oil palm, are not available. In fact, people-based oil palm plantations in Bapinang Hilir have not been included in the Central Kalimantan Province Oil Palm Plantation Cover Reconciliation Map issued by the Ministry of Agriculture in 2019²⁷. Even in the statistics of the Hanaut Island District, data on oil palm plantations in Bapinang Hilir have not appeared since 2015. Therefore, some programs issued by the government, such as aid of production inputs and seedlings, institutionalization of farmers, and rejuvenation of oil palm, are not accessible to farmers. According to the government, there are no oil palm farmers in Bapinang Hilir.

These conditions become a time bomb when the productivity of oil palm plantations has been declining or no longer bear fruit and the needs to replant arise. When the crop cannot bear fruit, the farmer must uproot the palm trees to the roots that have been embedded deep in the soil so that other plants can grow on it. The fire-resistant character of oil palm also makes it difficult for farmers to replace trees by burning them. The position of the land as part of the REDD+ project area and as a forest area makes it increasingly difficult to burn.

5.5 Analytical notes

In the previous chapter, the drive to accumulate land by coconut elites led to the canal dredging project, which extended and deepened the canal. It resulted in the drought, acidification of soil and peatland fire in the period of El Nino. The emergence of concession activities in Bapinang Hilir entails the changing relationship of humans to land, as now, both have become commodities in themselves. Albeit land became commodified in the past as it entails potentiality on economic activity on top of it, either for accumulation or social reproduction, it now in itself contains commodity in the form of carbon. As it has happened when land became commodified in the past form of *enclosure* and followed by expulsion, Bapinang Hilir entails the changes that happened differently (See Afiff, 2015). While land can be perceived as hope, as Natarajan et al. (2019) put it for Kiln Workers, it can also be a danger and avoided at all costs when the fire starts. Land that one was kept from getting burned in the fire season was now left to avoid hefty fines and the watchful gaze of REDD+ operators and enforcement agencies.

²⁶ See Regulation of the Minister of Environment and Forestry of The Republic of Indonesia Number 9 of 2021 on Social Forestry Management.

²⁷ See Minister of Agriculture Decree Number 833/KPTS/SR.020/M/12/2019 on Determination of the Area of Indonesian Palm Oil Cover in 2019

Moreover, living humans within both the project zone and State Forest are now generating added value to the carbon as the leader of RMU said stated that improving livelihood—as alternative to palm oil and logging, is the core component of business model (Devex, no date). The certification methods of RMU entailed the calculation of potential emissions from land use change not only from the corporations but also from people living in the perimeter or buffer. In counteracting the potential threat, human livelihood scenarios are calculated, and the proposed intervention tactic to increase livelihood was calculated as well as mandated in CCBS. Then, human is desired as long as they do not threaten the carbon stock that has been kept and followed the desired ‘sustainable livelihood imposed upon them’, thus generating additional value for carbon credits. The conditions would then leave the smallholder, as Carmenta et al. (2021) put it, as they were placed between multiple burdens, unfavourable policy pressure imposed upon them and the worsening biophysical conditions from the climate crisis. Hitherto, Sangkoyo (2013) reminds us that there is a flow of compensation money due to enlarged emissions from industrial activities, which, in the end, delegate responsibility for reducing greenhouse gas emissions towards the global south.

On the PCP side, the need to expend more labour in cultivating rice following ecological change resulting from peatland fire and indirectly by the introduction of REDD+ conservation measures in place squeeze their social reproduction, similarly observed by Merten et al. (2021). Albeit similarly squeezed the social reproduction, the case of Bapinang Hilir differs towards the case presented by Foster and Bernstein, where land is being exhausted and solvable with fertilizer. The change of peatland is irreversible, thus the changing biophysical conditions necessary for rice cultivation. Moreover, the ban on burning shrubs implies the need to change the commodities to satisfy social reproduction. The changing configuration is understandably unfolded from the historical conjuncture of Bapinang Hilir, where accumulation driven by coconut elites and land tenure of peatland repeatedly unfolded configuration where rice farming is unfavourable. The paddy farmer here became marginal due to the presence of REDD+—which was unfolded by peatland degradations, thus leaving no options for paddy farming, and the use of land needs to be changed.

Indifference to the case presented by McCarthy (2010), where smallholders were unable to plant palm oil due to limited capital, paddy farmers in Bapinang Hilir were able to do so. It was due to the context where planting rice, coconut and logging was deemed impossible due to the combination of restriction from REDD+ and law enforcement, plus peatland degradations and palm oil is deemed the only way, and PCP will pursue it no matter what. Their action on planting palm oil then became a resistance towards REDD+ (as it is deemed unsustainable) due to the tenurial status of their land and becoming what was described as a threat in the certification document. Planting palm oil can be viewed as their attempt to secure their own livelihood at a time of impossibility and suspicion. At present, they bet their future towards palm oil.

The context in which the impact of ecological change is differentiated across the class and other social groups is widely understood. However, as the melting north polar ice cap will benefit Northeast Asia and Northwestern European countries by opening new sea route (Bekkers, Francois and Rojas-Romagosa, 2015), peatland fire and degradation in Bapinang Hilir during the canal dredging benefited coconut elites. In the 2015 peatland fire, due to being preoccupied with swallow nests, coconut elites left behind the opportunity to expand the degraded and unused land. Instead, palm oil farmers seized the chance to expand their land by buying burned land in the east of Babirah River. The importance of their accumulation chance is that land on the west of the river is left undamaged by fire and thus expensive.

5.5.1 When conjunctures met

Land tenure of peatland derived from the canal construction as it made possible for sedentary agriculture, led to the formation of elites who not only controlled swathes of land for their coconut production but also controlled the land that was attached to the canals and consolidated power in the local government. Initial configuration during the colonial period made them able to dredge canals and control them. The canal dredging project satisfied the labour needed for expanding the canal, and the devastating ecological effects made them accumulate more land from PCP faced with the production problem. The context of which land tenure derived from peatland, which renders the inability to expand land through paddy farming and abandoning the land, made it possible also to accumulate land. At the later stage, palm oil middle farmers managed to accumulate land after the devastating impact of strong El Nino in 2015. This is a completely different conclusion towards the assumption that “poor people tend to make peatland degraded” as it was perceived by many (Silvius, Joosten and Opdam, 2008; Medrilzam *et al.*, 2017) or common neo-Malthusian. Indeed, ecological change is being utilized by capitalist and middle-class farmers to accumulate land, which implies it is important to situate the ecological change within the framework of commodification and following implications as Bernstein and Woodhouse (2001) informed, and Akram-Lodhi and Kay (2010) suggested.

However, it cannot reject the need for satisfying social reproduction and aspirations for the PCP to accumulate land, as the initial migration period made the coconut planting possible. Also, in the 1990s, when palm oil plantations were not heavily present in the Southern Mentaya regions, timber production was present to satisfy their aspiration to return to the land and accumulate more land. It is the same as the present stage, where farmers switch commodities towards palm oil. As an agent within the landscape of Mentaya River, the choices affect the configuration as well. Ex-colonial labour presents itself as labour available to the early coconut farming, timber production affecting the biophysical conditions by cutting trees in the forest, and palm oil farmers, which favour the intermediary quasi-middle palm oil farmers and situating them vis-à-vis the conservation efforts by REDD+ albeit configurations would make them unfavourable for the long terms.

Moore (2015) focuses on how capitalism as the whole system moves and configures the relationship between humans and nature. They focus on how global ecology changed and actively affected how capitalism developed. This approach through the Wallersteinian world-system approach would inherit a similar problematique of improvement of core affect the periphery of the change with limited attention on the trajectory of peripheral development. It traditionally neglected the issues of specific rural development of agrarian differentiation and commodification as it perceived it was simply incorporated within the world system. Over-emphasizing the ecology as to the points of anthropomorphize potentially obscures the political dynamics and human labour embedded within the said landscape. In the case of Bapinang Hilir, it led to the obscuring of the profits from degradations and the drive for land expansion unintentionally unfolded degradations and more accumulation, as it needs an underlying assumption of the capitalist production process to alienate humans and nature as proposed by Marx (1990).

However, the specificity, trajectory, and changes of Bapinang Hilir configurations with its peatland landscape, specific land tenure and commodification that is happening from coconut to the carbon will be obscured without specific inquiry on the people who live within it. Rural society is not simply homogenous to reiterate agrarian political economy scholars, but rather a differentiated society. Therefore, the analysis of the process of commodification and how it generates agrarian differentiation and changing social relations in nature. Moreover, lack of focus on how biophysical conditions are only related to the excess and typical trajectory of soil exhaustion, as informed by Foster (2000) and Bernstein (1979), thus

assuming that it will be counteracted by control of tools or instruments. The deployment of O'Connor's (1988, 1998) conditions of production and labour agency as an underlying approach to the rural society and analyzing labour regime through agrarian political economy unfold the co-constitutiveness of ecological dynamics and commodification process. To conclude, we refer to Marx that labour is a mediating factor of human and nature's metabolism, which in itself is a force of nature.

Map 5.3

Satellite imagery of Bapinang Hilir taken in 2021.



Source: Sentinel 2 and Open Street Map.

Description: Dark blue colour indicates Babirah River, white for Bapinang Hilir and blue lines for canals.

Chapter 6

Conclusion

This research has unfolded the co-constitutiveness ecological change and the rural labour process in Bapinang Hilir. Through agrarian political economy, it analyzes the accumulation drive from farmers, which induces ecological changes and how it enables them to expand more land. The land expansion was the case for coconut elites during the canal dredging project, where they initiated it and then profited from the devastating impact that was being brought. Then, in the conditions of degraded peatland and exacerbated by the strong El Nino season, palm oil farmers could expand the cheap and degraded land on the eastern bank of the Babirah River. Furthermore, they profited from the massive commodity changes undertaken by other farmers due to biophysical conditions and restrictions imposed upon them by the REDD+ measures.

The research also captures the relations of national configurations towards the locally specific one on how they relate to the changing biophysical conditions and the process of agrarian differentiation. It can be shown how the conditions during the colonial period of the Banjarmasin War, Netherlands Indie's focus on coal, boom of coconut oil and policy regime unfold the development of smallholder coconut plantings led to the formation of canal controller and coconut farmers in Bapinang Hilir, which previously unable due to the biophysical conditions of peatland. Then, during the drive of capital expansion into the peatland, by programs of canal dredging and massive timber economy in Kalimantan, the local farmers capitalized on it, changing the biophysical conditions which led them to accumulate land in the areas. At the same time, PCP resorted to entering the timber industry. The latter, devastated by canal dredging, the succession of strong El Nino, and the expansion of palm oil, a new attention, then business, made the carbon stored in the peatland valuable. It brought changes, measures, and restrictions towards the PCP of Bapinang Hilir, which transformed them into palm oil farmers, thus profiting the existing Palm Oil farmers.

Moreover, the research does not neglect the actions of PCP in the areas of their responses towards the accumulation drive of another farmer within the limits of the configuration at the time and also their impact on the landscape as a spatial agent. Massively being involved in the timber industry due to the profits it entails, changing biophysical conditions from canal dredging and unavailability to accumulate more land, even with the additional parcel, could be seen as one of their drives towards social reproduction, with the aim to returns to land. Involvement in palm oil in the event of REDD+ restrictions and measures, the threat of peatland fire and benefits from the potential profits and perceived as a simple crop led them to switch commodity to palm oil. Moreover, as a spatial agent, their action would change the configurations as logging would inevitably affect the biophysical conditions, albeit peatland fire severely affected their production. Palm oil would imply more measures and restrictions due to the political nature of the commodity itself and the plantations' historical threat towards biodiversity and climate.

The research found that conceptualizing agrarian differentiation in agrarian peatland settings would be impossible without involving the ecological changes that happened. It is also the same for the impact and cause of ecological changes in rural peatland settings as dynamics unfolded from commodification would tightly affect the biophysical conditions of where it occurred. Therefore, to reiterate, the research explanation shows that the co-constitutiveness of both ecological dynamics and labour process is central to understanding the agrarian setting. It is futile to collapse analytically nature and humans as there is a drive to accumulate or socially reproduce themselves for the latter as it does not enlighten the collided desires of

accumulations and securing social reproduction in farmers. It is also unhelpful to reduce the degradation as only an excess from the capitalist commodity production, as humans can potentially profit and accumulate from the ecological changes. Therefore, it is important to refer to Marx as labour is tied but differentiated with nature, and capitalism alienates them. O'Connor's conceptualization on the conditions of production with the specific emphasis on understanding it as a configuration of space and inherent questions to satisfying the under-reproductions of it is valuable for agrarian studies when analyzing environmental degradations and commodification process. It is informed by Natarajan that PCP itself embodied both capitalist and labour, which are constantly faced with changing configurations, and all actors (capitalist and labour, as many agrarian political economy scholars emphasize when analyzing rural settings) are equally important to view their spatial agency. In the end, this research shows that O'Connor's approach can emphasize what the challenge by Akram-Lodhi and Kay (2010, p. 269) towards agrarian political economy scholars by stating: "[...] rural production process, agrarian accumulation and rural politics have ecological dynamics [...]". It impacted "[...] upon the process of production, and hence processes of class formation [...]" and "[...] can contribute to or constrain the process of accumulation."

Due to the space constraint, this research is unable to unpack much more on historical conditions in the colonial period, the explanation of the cause and impact of the Banjarmasin War, the process of migration and the typology of migrants derived from Banjarmasin Sultanate and the colonial conditions preceding the war. Furthermore, the explanation of the peatland degradation in this article is based on forest loss, local people's statements, and direct observations, which the empirical data on the acidity and soil characteristics is still lacking. Then, further inquiry on gender and quantitative analysis of income and landholding needs to be addressed further. Moreover, the resistance of the Dayak Misik Group is only based on their activity within the local site, as it is important to understand their networks of connection and interest in mounting the struggle against REDD+.

Therefore, there is a need to undertake a comprehensive and complete analysis of Southern Mentaya from the colonial period up to the present while deploying O'Connor's conditions of production analysis. Further research thus can specifically concern on the processes of agrarian transition from pre-capitalist formation to capitalism with an emphasis on labour process and ecological change. In doing so it can provide further understanding on more grand questions of capitalism and nature, on how it changes the human-nature relation and thus how labour responded in the event of climate changes.

Appendix 1

Fieldworks Interview Guides

Pre-fieldwork discussions

- Technicalities of fieldwork
 - I informed about the location context and the differences between living in Java and Bapinang Hilir.
 - I informed about the ownership of the data and clearly stated that information collected is freely used by my research assistant and Agrarian Resource Center.
 - I will inform my connections about my reason for sending research and informs them about his arrival.
 - I will ask my connections to let the research assistant to stay in their house with a money compensation.
 - I will ask my connections to arrange the transportation from the airport to the house with a money compensation.
 - Amount and mechanism of payment.
 - Forms of consent, anonymity, and information confidentiality.
- Theoretical discussion
 - My non-published article.
 - My ISS Research Paper Design.
 - The questions guide.
 - Target informants

Target informant (if applicable)

- Paddy farmers and logger
- Paddy and palm oil farmers
- Paddy farmers only
- Paddy farmers and agricultural wage-labour
- Paddy farmers and plantations labour
- Palm oil farmer only
- Coconut elites
- Village Elders
- Loggers only
- Palm oil intermediaries

Main Questions

- Bapinang Hilir History
- Canal history in Bapinang Hilir
- History of Palm oil cultivation

- Village history and during logging period
- REDD+ history in the village
- Changing commodities
 - Coconut to palm oil
 - Paddy to palm oil
- Present barrier and concerns in planting palm oil
- Changing paddy cultivations
- The impact and cause of peatland fire

Discussion during fieldwork

- Research Assistant will send fieldnotes of daily observation every week and recording of interviews and photograph at the end of fieldwork.
- I will read the fieldnotes every week and have an online discussion with Research Assistant every week.
- If there is any problem during fieldwork, the Research Assistant will inform me, and I will be the best as I can to respond.

Questions guide (if applicable)

The research assistant is not expected to ask the whole questions in this guide. Rather, the sets of questions are acting as a guide to explore issues on land tenure and labour regime in peatland. The fieldwork which I undertook in 2019-2020 was using same questions guide as Pace did in 2023.

About the land tenure

Land ownership	<i>Do you have land?</i>
Land area	<i>How much land did you buy/lease/own?</i>
How to acquire land	<i>How to acquire the land? Forest clearing/buying/leasing/inheritance/other? What is the mechanism? What are the conditions that must be met?</i>
Land use	<i>Is all land fully agricultural? If not, how much is not agricultural land? And what is it used for and why?</i>
Land transfer	<i>Has the land ever been transferred to someone else? If yes, how much is the area? What is the mechanism, bought/leased/taken/granted/inherited/returned to the original right-holders/others? To whom are the children/siblings/parents? What is the transfer mechanism? What do you get, money/other forms?</i>

About the canal control

Canal coverage	<i>What is the land area covered by this canal?</i>
Canal Ownership	<i>Who controls this channel?</i>
Construction	<i>When was the canal constructed? How was the canal constructed? Who participates in peat canal construction?</i>
Spending	<i>How much capital is required for canal construction?</i>
Operational	<i>How is capital accumulated through these channels?</i>
Maintenance and repair	<i>Who is responsible for the repair?</i>
Division of labor	<i>Who does the maintenance? What production tools are required? How much does maintenance cost? Who are the laborers being deployed?</i>

About the means of production

Land area cultivated	<i>How much land is cultivated? How much land did you buy/lease/own?</i>
Land ownership	<i>Is the land owned by yourself/your parents/siblings/others? What land does it sit on?</i>
How to acquire land	<i>How to acquire the land? Forest clearing/buying/leasing/inheritance/other? What is the mechanism? What are the conditions that must be met?</i>
How to obtain capital	<ul style="list-style-type: none"> • <i>How much money is needed for one planting season? How is capital obtained, own/borrowed/assistance/grants from other parties? If borrowing, how much and for how long? Who is the borrower?</i> • <i>Are there any conditions/guarantees given to borrowers? In what form? How is the borrowing mechanism done? What happens if the loan cannot be repaid?</i>
Spending	<i>What is the mechanism for returning the capital? What expenses are associated with the secondary canal?</i>
Land preparation process	<i>What is done to peatlands before they are planted? Who is working to prepare the land? How much is the salary? What do you do?</i>

About peat canal blocking and fire

Land fire	<i>Did you control the land that burned in 2015? How much damage was caused by previous land fires? Have you planted crops before? How is the land now? Has it been planted? Are you planning to plant other crops?</i>
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About family deployments

Division of labor	<p><i>Who in the family/siblings/children work?</i></p> <p><i>What does each person do when on the land and why?</i></p> <p><i>How long did the work take?</i></p> <p><i>Are there certain conditions for who can/cannot work on the land? Why?</i></p>
Other income	<p><i>Are there any other jobs outside of palm oil?</i></p> <p><i>Who is working?</i></p> <p><i>How long does the work take?</i></p> <p><i>How can he work on the land?</i></p>

About labour deployments

Working time	<ul style="list-style-type: none"> • <i>What kind of work do laborers do?</i> • <i>What is the working time-sharing scheme?</i> • <i>How old is he?</i>
Labor deployment	<ul style="list-style-type: none"> • <i>Where do the workers come from (ethnicity and location)?</i> • <i>Why are these workers deployed?</i> <ul style="list-style-type: none"> ○ <i>What is the reason for labor specifications for certain jobs?</i> • <i>How can they become laborers?</i> <ul style="list-style-type: none"> ○ <i>Who are the actors mobilizing them?</i> • <i>Why do they become oil palm plantation laborers?</i> <ul style="list-style-type: none"> ○ <i>Economic conditions of the family and region of origin?</i> • <i>How do you divide your work time to other farms?</i> • <i>Is there any other income besides palm oil labor?</i>
Wages	<ul style="list-style-type: none"> • <i>When is the wage given?</i> • <i>Are there other incentives besides wages?</i>

About production process

Agricultural tools and water	<p><i>What inputs are needed for oil palms?</i></p> <p><i>How much is needed?</i></p> <p><i>Who/where are the input needs obtained from?</i></p>
Input capital	<ul style="list-style-type: none"> • <i>How much money is needed for one planting season? How is capital obtained, own/borrowed/assistance/grants from other parties? If borrowing, how much and for how long? Who is the borrower?</i> • <i>Are there any conditions/guarantees given to borrowers?</i> <p><i>In what form?</i></p> <p><i>How is the borrowing mechanism done?</i></p> <p><i>What happens if the loan cannot be repaid?</i></p>
Harvest production	<p><i>What is the quantity of yield for each commodity in one harvest?</i></p> <p><i>How is it in bad/good condition?</i></p> <p><i>Why is the harvest bad/good?</i></p> <p><i>Who determines the harvest time? And why?</i></p>
Yield ad-	<i>How much profit is made in one harvest and what is the profit per</i>
Harvest utili-	<i>How much of the harvest was sold?</i>

About palm oil distribution chain

Harvest sales	<ul style="list-style-type: none"> • <i>Who delivers the FFB from the farm to the agent?</i> <ul style="list-style-type: none"> ○ <i>What is the wage system?</i> ○ <i>How and why were these workers chosen?</i> • <i>Where does the agent come from?</i> • <i>Are there any other agents?</i> • <i>Why do you sell to these middlemen/cooperatives/collectors, is there a prior agreement?</i> • <i>Who are they and why?</i>
FFB delivery to mill	<p><i>What production tools are required?</i></p> <p><i>What access do agents need to be able to deliver tbs to the mill?</i></p> <p><i>How did the agent select the mill?</i></p> <p><i>Are there any further intermediaries to enter the mill?</i></p>
Value exchange between agents and farmers	<ul style="list-style-type: none"> • <i>When is the FFB transaction conducted?</i> • <i>What is the value exchanged in this FFB transaction?</i> • <i>How much does the Farmer get?</i> • <i>How much does the agent get?</i> • <i>Is there a relationship between tbs distribution agents and inputs and capital?</i>

About accumulation

Profit level	<i>Is there a surplus - after deducting the production capital? If not, is it only enough to return the production capital or not? What do you do when you lose money to support your family, borrow money/pawn assets/other, to whom and what is the mechanism?</i>
Division of labor	<i>How to hire/share the fruits of labor if the harvest is not surplus, borrow/loan/other? To whom?</i>
Use of production output	<p><i>If there is a surplus, what are the profits used for?</i></p> <p><i>Consumed for the household/school fees/capital for the next season/other? What is the estimate?</i></p> <p><i>Is it used to repair peat canals?</i></p>

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