Stakeholder Perspectives on Sustaining Post-Project Peatland Restoration Outcomes: A Case Study in Jambi Province, Indonesia

by

Arifah Hidayati

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Candidate's Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

Arifah Hidayati   Date: 24/10/2024

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Abstract

Peatland ecosystems are vital for Indonesia's climate change mitigation objectives but face significant degradation risks. Indonesia, as the location of the world's second-largest tropical peatlands, has prioritised peatland restoration for nearly a decade. Restoration initiatives involve a diverse array of stakeholders—including government agencies, donor organisations, the private sector, NGOs, academics, and local communities—with substantial resources allocated to seven key provinces, including Jambi. However, most restoration efforts are limited to pilot projects rather than sustainable long-term interventions. Lessons learned from previous initiatives emphasise the necessity of enhancing stakeholders' understanding of peatland restoration and aligning restoration efforts with their strategic interests to foster long-term commitment by stakeholders.

This research aimed to elicit stakeholders' perspectives on the value of peatlands, their goals after the completion of restoration projects, and actions they believed necessary to achieve them. It takes a project sponsored by the Government of the Republic of Korea as an Official Development Assistance activity, *Restoration of Burnt Peatland in Jambi*, as a case study. Fieldwork was conducted from June to July 2024, employing semi-structured interviews with purposively sampled participants (n= 22), alongside field and participant observations to gain insights into project implementation and stakeholder interactions. Qualitative thematic analysis was used to assist interpretation of the data.

Previous studies have highlighted the significance of collaboration in Indonesian peatland restoration. However, existing reports often lack comprehensive information on the post-project experiences of these restoration efforts. The analysis reveals a deficiency in adaptive long-term planning for sustainable restoration, despite participants' hopes for ongoing activities. Additionally, there is a varied understanding of the '3R' (rewetting, revegetation, and revitalisation of local communities' livelihoods) approach, with communities being more familiar with revitalisation activities.

This research underscores the complexity of issues in restoring peatland ecosystems for climate change mitigation while also maintaining their productive use. Understanding stakeholder perspectives is crucial for effective collaboration in landscape-based ecosystem management, ensuring local communities are central to development projects. Otherwise, outcomes may be suboptimal, and funding may be inadequate to foster sustainable practices.

While this study highlights the importance of stakeholder perceptions in sustaining peatland restoration efforts in Jambi, it also notes the limited representation of interviewees and the absence of private sector perspectives. Future research should engage all stakeholder categories involved in the restoration agenda and apply a Social-Ecological Systems (SES) framework to capture the intricate dynamics of social and ecological components. Additionally, improving peatland restoration governance could benefit from the Collaborative Environmental Governance (CEG) framework to navigate the complexities and competing interests inherent in Indonesia's peatland ecosystems.

Table of Contents

List of Figures

List of Tables

List of Acronyms and Abbreviations

3R	Rewetting, revegetation, and revitalisation of local communities' livelihoods
BRGM	National Peatland and Mangrove Restoration Agency
CEG	Collaborative Environmental Governance
CKPP	Central Kalimantan Peatland Project
DAK	Special Allocation Fund (from the state budget)
DMPG	Independent Peat Care Village program
FMU	Forest Management Unit
HLG	Peat Protected Forest
KIFC	Korea-Indonesia Forest Cooperation Center
KFCP	Kalimantan Forest and Climate Partnership
MCA-I	Millennium Challenge Account Indonesia
MEF	Ministry of Environment and Forestry
MRP	Mega Rice Project
ODA	Official Development Assistance
PHU	Peatland Hydrological Unit
P+2	Second year of maintenance for revegetation activities
PKG	Directorate of Peat Degradation Control, MoEF
RIMBA MCA-I	Restoration project to support wildlife corridor in Riau, Jambi, Sumatera Barat
RPPEG	Peatland Ecosystems Protection and Management Plan
SES	Socio-Ecological System
TKPPEG	Community working group in DMPG program
WLDL	Water level data logger

Chapter 1

Introduction

An aerial view of the degraded peatland ecosystem in Londerang, Jambi Province, that was burned in 2019, with the manmade canal networks built to support industrial plantations clearly visible (credit: KIFC).

Chapter 1: Introduction

1.1 The state of the global peatland ecosystem, peatlands in the tropics, and their associated threats

Peatlands play a significant role in mitigating climate change. Peatlands (also known as mires or bogs) are a type of terrestrial wetland ecosystem characterised by the accumulation of peat layers (Vitt, 2013; Page and Baird, 2016). These layers are primarily composed of partially decomposed organic matter originating mostly from vegetations and formed under waterlogged and oxygen-deficient conditions (Frolking et al., 2011; Rydin and Jeglum, 2013; Page and Baird, 2016). To form peat layers, the rate of plant biomass production must exceed the rate of chemical decomposition (Andriesse, 1988). While peatlands occupy only approximately 3% of the Earth's surface, or equivalent to around 400 million km² (Limpens et al., 2008; Yu et al., 2010; Xu et al., 2018), their remarkable carbon density enables them to sequester between 15% to 30% of the global soil carbon, surpassing even tropical rainforests in soil carbon storage capacity (Frolking et al., 2011; Pan et al., 2011; Scharlemann et al., 2014; Vitt, 2013). Peatlands provide a variety of benefits that are frequently overlooked, including storing and capturing carbon, regulating water and prevent saltwater intrusion, safeguarding biodiversity, mitigating natural risks, supplying food and energy, and providing recreational opportunities (Kløve et al., 2017; Noor et al., 2005; Page and Baird, 2016).

The tropical regions of Southeast Asia, including Indonesia, Malaysia, Papua New Guinea, and Brunei, account for 10% to 16% of the global peatland ecosystem with carbon reserves ranging from 80–90 Gt (Page et al., 2011; Page and Baird, 2016; Rieley and Page, 2016). The extent of peat ecosystems in tropical regions is less than that in the boreal and subarctic northern hemisphere regions (Immirzi et al. 1992 as cited in Page et al., 2011), but they have great biodiversity significance, as they are home to several endangered species including the Bornean orangutan and Sumatran tiger (Morrogh-Bernard et al., 2003; Giesen, 2004); and play a significant role in providing beneficial environmental services (Girkin et al., 2022; Hergoualc’h et al., 2018). While data vary, the most recent assessment by Page et al. (2011) indicates that Indonesia hosts the largest expanse of tropical peatlands. According to indicative data released by Indonesia's Ministry of Environment and Forestry (2017), Indonesia's peat hydrological unit covers a total of 24.6 million hectares at a mapping scale of 1:250,000. Meanwhile, the semi-detailed mapping at a scale of 1:50,000 from the Ministry of Agriculture shows the total peatland area in Indonesia is 13.43 million hectares (Anda et al., 2021).

However, tropical peatlands are experiencing an alarming rate of deforestation and degradation. Southeast Asia has emerged as a hotspot for these processes, where almost 80% of the natural peatlands have been logged and drained (Mishra et al., 2021), driven by anthropogenic factors including strong economic and social pressures for timber, agricultural land, and the cultivation of oil palm and pulpwood plantations (Koh et al., 2009; Miettinen et al., 2012; Dohong et al., 2017). Manmade canals were constructed to drain the peatland for intensive agricultural activities (Page et al., 2009a; Ritzema et al., 2014). Mining is also highlighted as one of the threats to peatland, as highlighted by Dise (2009). While a review by Cole et al. (2022) suggests that tropical peatlands have demonstrated resilience in recovering from past fire, climatic, and human disturbances, the findings show ecosystem resilience of peatlands in Southeast Asia has been compromised over the last two centuries.

1.2 Stakeholder perceptions of peatland restoration

Although the Government of Indonesia established BRGM as the main institution for national peatland restoration, other stakeholders at various levels of interest are also involved in this endeavour (Ward et al., 2020). These stakeholders include donor/aid institutions, government agencies, research institutions, private companies, and local communities (Nugroho et al., 2021; Robins et al., 2022; Lestari et al., 2024). A previous study by Januar et al. (2020) emphasised that cross-sectoral collaboration at the regional level has resulted in progress in restoration. In restoring degraded peatlands, project design must be based on both scientific knowledge and tailored to socio-economic conditions and should not proceed without obtaining the consent and cooperation of local communities (Page et al., 2009a).

Findings from research by Ward et al. (2020) suggest that various stakeholders concur on the significance of peat ecosystems due to the benefits they offer, yet they hold differing perspectives on how peat ecosystem restoration should be carried out. Respondents with expertise in biodiversity or environmental protection argue that a fully restored peatland landscape cannot accommodate agriculture in its current form. However, others have voiced concerns regarding the implications of this stance for the local communities residing in these areas (Ward et al., 2020). A study conducted by Puspitaloka et al. (2021) underscores the perception of local communities that restoration facilities (i.e., dams or canal blocks used as infrastructures for rewetting) hindered their access to livelihoods, which aligns with findings from several other studies indicating that dams/canal blocks were perceived as obstructing transportation access due to the community's lack of awareness about the function of canal blocks (Dohong et al., 2018; Suyanto et al., 2009).

As stated by Harrison et al. (2020), political and financial support will be essential for the next few decades or even generations to ensure that the restoration of burned peatland can fully revert to its 'natural' condition. One major challenge for peatland restoration is that many of the restoration activities were funded by projects with a defined life (see Atmadja et al., 2014; Suryadiputra et al., 2018). This raises questions about the sustainability of project goals after the project ends.

1.3 Research purpose and questions

This thesis aims to examine stakeholders' perceptions of the value of peatland ecosystems, the risks faced by degraded peatland ecosystems, their goals following the completion of restoration projects, and the actions they believe are necessary to achieve these goals. It takes as a case study the *Restoration of Burnt Peatland in Jambi* project, funded by the Government of the Republic of Korea in response to the extensive peat fires of 2015. The Official Development Assistance (ODA) project was undertaken as part of bilateral cooperation between the two countries. The project is situated within the Londerang Peat Protected Forest in Jambi Province. Jambi's peatland ecosystem encompasses 9.42% of the total peatland area on the island of Sumatra (Directorate of Peat Degradation Control MoEF, 2017) and is one of seven provinces prioritised by the BRGM for peat ecosystem restoration due to its susceptibility to fire risks.

Using the *Restoration of Burnt Peatland in Jambi* project as a case study, I investigate stakeholders' goals after the project concludes, and the actions they consider important to achieve those goals. Enhancing and aligning stakeholders' understanding of the significance of peatland restoration is vital, ensuring they recognise that it serves their strategic interests (Januar et al., 2021). Several studies have investigated stakeholder perspectives on peatland restoration efforts in Indonesia at both regional and national levels (Fleming et al., 2024; Jauhar et al., 2021; Ward et al., 2020; Ward et al., 2021). This thesis aims to contribute to existing knowledge by shedding light on how key stakeholders perceive peatland restoration in the context of Jambi Province, their post-project expectations or goals, and the essential factors needed to achieve them.

This thesis addresses the following principal research question and four sub-questions:

- How do key stakeholders perceive the value of peatlands, their goals after the completion of restoration projects, and what actions do they believe are necessary to achieve them?
    1. What is the experience in Indonesia of peatland restoration projects after the project ends?
    2. How do key stakeholders interact with peatlands in Londerang, perceive their value, and recognise the risks associated with degraded peatlands?
    3. What goals do Londerang peatland restoration project stakeholders have after the project ends?
    4. What actions do Londerang peatland restoration project stakeholders consider as necessary to achieve these goals?

The research will draw from literature reviews, interviews with key stakeholders, and participant and field observations.

1.4 Thesis outline

This thesis consists of six chapters, including the introduction. Chapter 2 is the literature review, covering peatland ecosystems in Indonesia, their governance, and key insights from previous peatland restoration projects in various regions to understand the nature of restoration efforts within the Indonesian context. Chapter 3 outlines the methodological framework and introduces Londerang in Jambi Province as the case study. Chapter 4 presents data collected from the field, including interviews with key stakeholders involved in the Londerang peatland restoration projects, along with field and participant observations. Chapter 5 discusses the main findings from the field to address the research questions and their broader implications. Finally, Chapter 6 summarises the findings related to the research questions and provides recommendations for future research and restoration initiatives.

Chapter 2

Literature review

One of the canal blocks built as part of the rewetting activity, aimed at retaining water within the peatland, keeping the peat layers wet, and reducing the risk of fires during the dry season (credit: KIFC).

Chapter 2: Literature Review

Peatland ecosystems in Indonesia holds a wide array of values for local communities, the nation, and the world (Hergoualc'h et al., 2018). With the increasing global attention towards tropical peat ecosystems, many researchers have made Indonesia the focus of their studies. The first part of this chapter summarises findings from previous studies about the general condition of peatlands in Indonesia, which includes the biophysical condition and the importance of peatlands for biodiversity preservation, the historical management of peatlands starting from the traditional use by several Indigenous communities, through the early era of intensive agricultural practices, to their current usage. A review of literature concerning the risks and threats to peatlands and how they cause degradation is also presented. The governance of peatland ecosystems is discussed in the second section to provide more context.

Different institutions are responsible for peatland ecosystem restoration in Indonesia, depending on where the peatland ecosystem is located (BRGM, 2021). Based on the financing scheme, efforts to restore peatlands are categorised into two types: restoration carried out by concession holders and project-based restoration by the government. The third section draws lessons from some completed and on-going peatland restoration initiatives in both categories. However, this study will focus on project-based restorations, which aim to meet the government's restoration targets but may also involve cooperation with various stakeholders, including donor organisations and members of civil society.

2.1 *Peatland ecosystems in Indonesia*

2.1.1 Biophysical condition and biodiversity of peatlands in Indonesia

Andriesse (1988) notes peatlands in Southeast Asia, which includes Indonesia, primarily originate from large *Pteridophytes* (tree-ferns) and develop under conditions of abundant rainfall and high temperatures. Most peatland ecosystems in Indonesia, particularly those found on the island of Kalimantan and Sumatra, are ombrogenous, i.e. exclusively affected by rainfall water (Ribeiro et al., 2021), and typically develop in sedimentary environments that include marine and brackish conditions, or fluvial and alluvial settings, or sometimes a mix of these (Omar et al., 2022). In contrast, peatlands in Papua are predominantly formed at altitudes of 1000 meters above sea level, referred to as montane peatlands (Hope, 2007). Miettinen et al. (2016) stated that only 7% of pristine peat swamp forests are still present in Sumatra and Kalimantan, with Papua being the sole region holding significant expanses of unmodified peatlands (Hergoualc'h et al., 2018).

Indonesia's vast peatlands cover 13.43 million hectares across four major islands: Sumatra, Kalimantan, Papua, and Sulawesi (listed in descending order of size; Anda et al. 2021). The depth of peat in Indonesia varies significantly, from 50 to 1050 cm, although the predominant depths fall within the range of 50 – 300 cm (Anda et al., 2021). Peat depth is one of the main criteria used in formally determining the functions of the peat ecosystem, such as in the Ministry of Environment and Forestry (MoEF) Regulation Number P.14/2017, which includes the protection function and cultivation function (MoEF, 2017).

Tropical peatlands are vital for ecosystem services and biodiversity conservation (Yule, 2008; Yuwati et al., 2021). They serve as habitats for threatened species such as the orangutan (*Pongo* spp.), Sumatran tiger (*Panthera tigris sumatrae*), proboscis monkey (*Nasalis larvatus*), Bornean gibbon (*Hyllobates muelleri*), Sunda pangolin (*Manis javanica*), and Bornean river turtle (*Orlitia borneensis*) (APRIL, 2023; Harrison et al., 2010; Harrison & Rieley, 2018; Posa et al., 2011). Despite their significance, many peatland areas remain unsurveyed, and species distribution is poorly understood (Posa et al., 2011). Additionally, these habitats support hundreds of tree species, some of which are increasingly rare (Noor et al., 2005), alongside various freshwater fishes and birds (Giam et al., 2012; Fujita et al., 2023).

2.1.2 Historical land use and management

Peatlands are vital for both wildlife and the numerous benefits they offer to humans. Multiple studies provide evidence supporting the significance of peatland ecosystems for the sustenance of indigenous communities across various regions in Indonesia. These communities have engaged in shifting cultivation, particularly on shallow peat located along riverbanks or coastal areas (Yuwati et al., 2021). Over centuries, the Dayak tribe in Central Kalimantan has nurtured peat soil for agricultural pursuits, relying on natural indicators such as seasonal changes, tree root patterns, and the behaviours of specific animals (Limin et al., 2007). Traditional Malay communities in Riau have also engaged in traditional harvesting practices at a frequency that can be balanced with natural growth of the trees, alongside other sustainable uses of mixed peat swamp forests on Kampar Riverbanks (Momose, 2002). Similarly, research conducted by Hapsari et al. (2018) in Central Sumatra reveals that forestry and agricultural activities by the Malay tribe in Sungai Buluh, such as logging, grazing, and wild harvesting, commenced shortly after humans settled in the vicinity of the peatland approximately 1,000 years BP. These successful agricultural practices by the communities have prompted government initiatives to extensively open peatlands for plantations, aiming to generate better income (Osaki et al. 2015). However, Osaki et al. (2015) argue that inadequate management strategies for land conversion have led to controversies over peatland utilisation.

Large-scale peatland conversion in the Southeast Asia region began predominantly in the 1970s (Rieley et al., 2008). In Indonesia, this process commenced even earlier, initiated by the central government around the 1960s for resettlement/transmigration programs and agricultural activity to fulfill the nation’s food security needs (Gunawan et al., 2021; Osaki et al., 2015). It was not until the 1990s that large-scale fire events began threatening peatlands in Indonesia, due to the drying of peat following the construction of large artificial canals in deep peat as part of the land preparation phase for agriculture (Gunawan et al., 2021; Rieley et al., 2008). The consequences of this are evident in the Mega Rice Project (MRP) in Central Kalimantan. It remains a prime example of mismanaged peatlands, mainly due to improper water management techniques, which have led to a decrease in the groundwater table, wildfires, and other disasters (Limin et al., 2008; Page et al., 2002; Suyanto et al., 2009). The establishment of large-scale industrial plantations, mostly oil palm and acacia for the pulp and paper industry, have subsequently accelerated changes in the land cover of peatland ecosystems in Indonesia. Multiple studies suggest that the process of conversion from nearly pristine peatland to plantation at any one location typically occurs within six years, with numerous cases of peatland conversion to agriculture taking place outside the recognised concessions designated for industrial plantation development (Astuti et al., 2022; Miettinen et al., 2013; Wijedasa et al., 2018).

The basis of peatland ecosystem management in Indonesia is the Peat Hydrological Unit (PHU), which seeks to achieve a spatially optimised wetland landscape (Langston et al., 2024). MoEF Regulation Number P.14/2017 defines the PHU as 'a peatland ecosystem located between 2 (two) rivers, a river and a sea, and/or at a swamp' and as of 2017, there are 865 PHUs nationwide which are categorised into protection function and cultivation function based on the peat depth. The regulation also addresses the delineation of peat ecosystem zones. Peatland with a depth exceeding 3 meters, with specific or endemic germplasm, and serving as habitat for legally protected species, shall be classified within the protection function. The MoEF regulation also mandates that crops or tree cultivation must be situated outside the protection zone, but as noted above, this restriction may not always be observed in practice.

2.1.3 Threats to peatlands and degraded peatland ecosystems in Indonesia

Previous studies show that, despite local communities historically using peatlands for agriculture and forestry, the ecosystem remained resilient due to the relatively small scale of these activities. However, large-scale logging and agribusiness activities, along with various other factors, are currently threatening the existence of peatland ecosystems. Since the 1970s, Indonesian peatlands have become targets of various exploitation or development policies (Mizuno et al., 2023). Over 3 million hectares of peatlands in Indonesia are classified as moderately to severely degraded, remaining at high risk of further degradation and conversion (MoEF, 2018). The most recent significant disaster that compounded the degradation of peatlands was the 2.6 million ha of fires in 2015[1]. This event led to losses of US$ 8 million in the agricultural and forestry sectors and had an overall impact amounting to US$ 16 billion (World Bank, 2016).

Numerous researchers have investigated the factors contributing to the degradation of peatlands. In Indonesia, the main drivers of peatland degradation include conversion to timber logging (including the development of logging infrastructures, see Böhm and Siegert, 2001), the rapid growth of oil palm and pulp and paper industries (Miettinen et al., 2012; Varkkey, 2013; Wijedasa et al., 2018), construction of artificial canal networks (Ritzema et al., 2014), and fires (Chisholm et al., 2016; Kiely et al., 2021). Dohong et al. (2017) comprehensively reviewed the drivers of peatland degradation in Southeast Asia, including using some case studies from Indonesia, and identified two categories: direct and indirect (see Figure 1).

[1] Reported by Indonesia's MoEF at the Meeting of Communication Forum for Disaster Data and Information in Jakarta November 10, 2015 as cited from World Bank's report "The Cost of Fire: An Economic Analysis of Indonesia's 2015 Fire Crisis.

Drivers of peatland deforestation and degradation	Mechanisms that cause deforestation and degradation of peatland
Direct	
Logging (legal and illegal activities)	• Removal of peat swamp trees, which creates larger canopy gaps, increases micro climate and decreases humidity • Construction of logging roads and railways to ease access and transportation into interior forests • Construction of artificial drainage for transporting felled logs. Artificial canals/ditches disturb the natural hydrological balance due to increases in surface run-off and reduce water storage capacity
Conversion to large-scale agriculture including industrial plantations	• Land clearing to remove both woody and non-woody vegetation, replaced by monoculture plants such as palm oil, *Acacia crassicarpa*, rubber (*Hevea braziliensis*). • Construction of artificial drainage to lower the ground groundwater table so that crops cultivation may take place. Artificial canals increase surface run-off and reduce water storage capacity in the peatland
Artificial drainage	• Draining the excess water up to a certain required groundwater table level so that the peatland surface is elevated, thereby allowing cultivation. A lower groundwater table enhances peat oxidation, consolidation and shrinkage, leading to peat subsidence and carbon emissions.
Recurrent fires	• Clearing land for crop management • Peat fires remove both above-and-below carbon stocks, thereby releasing immense stores of CO_2 to the atmosphere. In addition, fires also destroy woody and non-woody vegetation and on-site seed banks
Poverty and traditional farming practices	• Higher reliance of local people on timber and non-timber forest products for livelihood sources. The removal of timber and other products creates peat swamp forest degradation • The use of fire for clearing agriculture land is commonly practised by local farmers.
Indirect	
Climate change	• Extended droughts (El Niño) and excessive precipitation rates (La Niña) induced by climate change affect the eco-hydrology properties (water storage, humidity, evaporation) and vegetation structure and richness in peatland areas • Prolong droughts during the El Niño events will drawdown the groundwater tables leading to the enhancement of peat oxidation, increases microbial activities, peat subsidence and hence, increases CO2 emission
Land use policy and governance	• There are not many regulatory and policy measures that are specifically regulated about peatland conservation and protection • Inconsistency and lack of enforcement of existing regulatory and policy measures

Figure 1. Summary of various drivers of peatland degradation in Southeast Asia region (drawn from various sources by Dohong et al., 2017).

2.2 Peatland governance in Indonesia

Peatland management in Indonesia is overseen by multiple agencies (Uda et al., 2020). The Ministry of Environment and Forestry (MoEF) is the primary body for peatland ecosystem management, including granting business permits. The Ministry of Agriculture and the Ministry of Public Works and Public Housing manage non-forested peatland use, and the National Peatland and Mangrove Restoration Agency (BRGM) oversees the restoration of degraded peatlands.

In 2016, a National Peatland Restoration Agency, known as Badan Restorasi Gambut (BRG), was established to accelerate peatland restoration and prevent future fires through rewetting to restore hydrological function, revegetation of bare peatlands, and livelihood revitalisation (the '3R' approach) in seven priority provinces, and it was mandated to report directly to President Joko Widodo of Indonesia (Republic of Indonesia, 2016). BRG was then extended until 2024, its mandate extended to mangrove restoration and transformed into the Peatland and Mangrove Restoration Agency (BRGM) with a restoration target of 1.2 million hectares of degraded peatland, as stipulated in Presidential Regulation Number 120/2020 (BRGM, 2021). Ideally, stakeholders responsible for peatland restoration efforts vary according to the land use types, as seen in Figure 2 below. BRGM is not designed to implement restoration, nor is it an authority that makes peatland restoration policies. Instead, it coordinates and facilitates those responsible for each type of land use (BRGM, 2020).

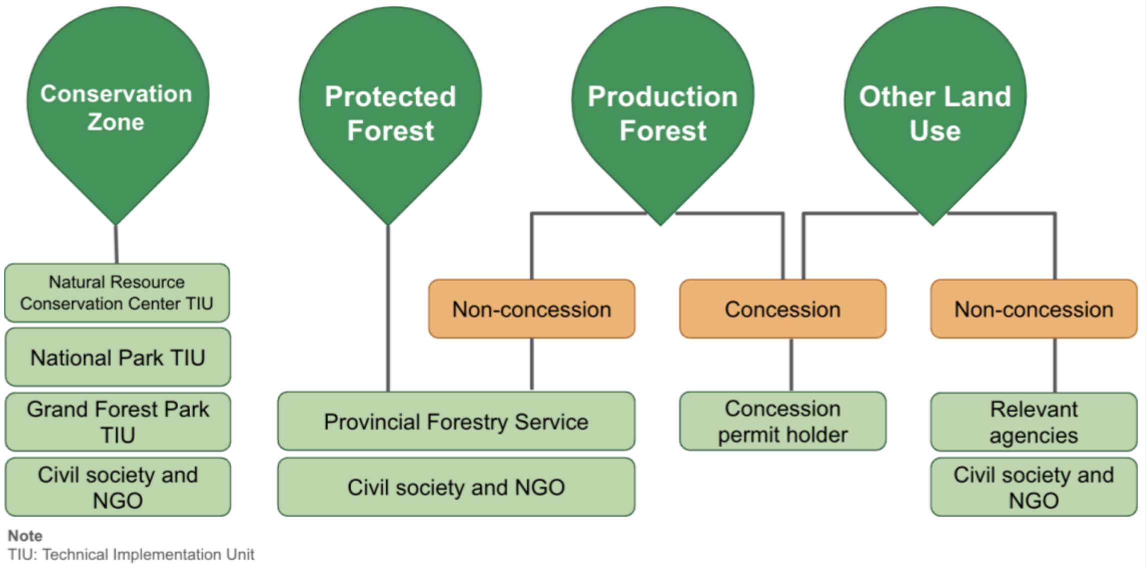

Figure 2. Stakeholders responsible for peatland restoration efforts according to land use types (adapted from BRGM, 2020).

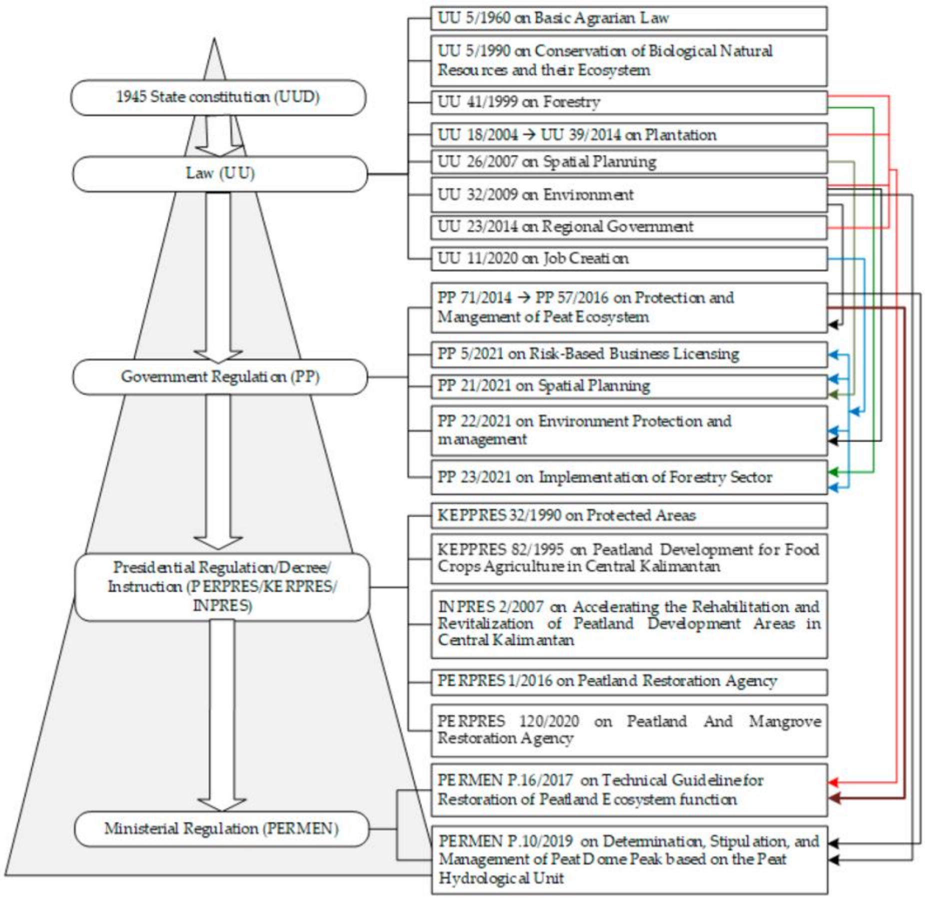

Figure 3. The hierarchy of the legal system for peatland restoration in Indonesia (reproduced from Yuwati et al., 2021).

There is a multitude of current policies governing peatland management in Indonesia. Murdiyarso et al. (2019) described these policies as 'ambitious and top-down'. Yuwati et al. (2021) conducted an extensive review and created a figure illustrating the hierarchy of existing policies, laws, and regulations that have both direct and indirect implications for the peat ecosystem, covering the period from the 1960s to 2019 (Figure 3). This research focuses on the protection and restoration of peatlands, with Table 1 detailing the policies issued in Indonesia for these purposes from 2014 to 2021.

Table 1. List of policies concerning the peatland protection and restoration.

Types of policy instrument	Subject	Key summary
Government regulation (PP)	PP No. 71/2014 jo. PP No.57/2016 concerning Protection and Management of Peat Ecosystems	Stages for planning peatland ecosystem protection and management, including inventory, determination of ecosystem function, and drafting the protection and management plan. Amendments include changes in the determination of the function of the Peat Ecosystem and the coordination process with

Types of policy instrument	Subject	Key summary
		competent authorities in the field of forestry,and the definitions of Peat ecosystem and PHU.
Presidential Regulation (Perpres)	Perpres No. 1/2016 on Peatland Restoration Agency	Establishment of a National Peatland Restoration Agency (BRG), to expedite restoration efforts following the massive fires in 2015.
	Perpres no.120/2021 on the Peat and Mangrove Restoration Agency	Renewal of BRG mandate and additional task of restoring mangrove ecosystems in 13 provinces resulted in the establishment of BRGM, with 'M' standing for mangrove.
President Instruction (Inpres)	Inpres No. 10/2011 concerning the Delay on New Licence Issuance and Perfection of Governance of Primary Natural Forest and Peat Lands	Moratorium on the issuance of new licenses in primary forests and peatlands (was renewed every twi years).
	Inpres No. 5/2019 concerning the Termination of the Granting of New Permits and Improvement of Primary Natural Forest Governance and Peatlands	The permanent moratorium on granting permits/licenses in primary forests and peatlands.
Ministerial Regulation (Permen)	Permen No.14/2017 on Peatland Inventory and Establishment of Peatland Function	Guidelines for conducting a peatland inventory and assessing its function based on its characteristics.
	Permen No. 15/2017 on the Mechanism to Measure Peatland Groundwater Level	Guidelines for measuring groundwater levels in peatland ecosystems
	Permen No.16/2017 on Technical Guidance of the Restoration of Peatland Ecosystem Function	Guidelines for peatland ecosystem restoration for different types of stakeholders (local/provincial governments, communities, and business owners)
	Permen No. 10/2019 on the Determination, Stipulation and Management of Peat Dome Peak based on Peat Hydrological Unit	Guidance for determining and managing peat dome peaks within PHUs.
	Permen No. 37/2019 concerning the Social Forestry on Peat Ecosystems	Outlines social forestry activities that can be conducted on peatland

Types of policy instrument	Subject	Key summary
Ministerial Decree (SK)	SK No. 129/2017 on the Determination of the Peat Hydrological Unit Map	National map of PHUs (scale 1:250,000)
	SK No. 130/2017 on the Establishment of Peatland Ecosystem Function National Map	National map of peatland ecosystem function (scale 1:250,000)

2.3 *Efforts to restore degraded peatlands in Indonesia*

Mismanagement of peatlands makes them more prone to catastrophic events such as peatland fires (Chisholm et al., 2016; Dohong et al., 2017; Yuwati et al., 2021), contrasting with relatively pristine peatlands that have shown resilience in maintaining their hydrological integrity (Wösten et al., 2008). The widespread and severe peat fires in Indonesia, which have occurred several times in recent decades, for example, in 1997 (Page et al., 2002), 2005, 2013 (Forsyth, 2014), 2015 (Uda et al., 2019), and 2019 (Hayasaka et al., 2020), have had major impacts on peatland ecosystems and caused transboundary haze which affect neighbouring countries (i.e., Singapore and Malaysia).

Several studies recommend restoration activities to address peatland degradation and its associated impacts (Dohong et al., 2017; Page et al., 2009a). Restoration aims to revive the natural resource functions of degraded ecosystems, thereby restoring the environmental and economic services they provide (Page et al., 2009a). However, decisions regarding the implementation of restoration, especially in large, degraded areas, must still consider the potential for natural regeneration due to the significant financial costs associated with tree planting (Graham et al., 2013; Sari et al., 2020).

In Indonesia, national programs for restoration of degraded peatland began in 2007, following the issuance of Presidential Instruction Number 2/2007, which focused on the Rehabilitation and Revitalisation of Peatland Development Areas in Central Kalimantan (Government of Indonesia, 2007). Subsequently, several other national policies and initiatives have been introduced, including the Government Regulation Number 71/2014, which prioritised the sustainability of peat ecosystems (Government of Indonesia, 2014; Yuwati et al., 2021). The goal of restoration according to BRGM (2020) is to achieve an 'optimum peatland ecosystem', where the peat remains consistently wet, preserving its key functions of water and carbon storage, even if its physical structure has changed from its original state. This was based on the consideration that it would take an extremely long period of time to restore the peatland to its original state (pre-human intervention).

2.3.1 Lessons learned, opportunities and challenges of peatland restoration initiatives

Current peatland restoration practices in Indonesia are predominantly characterised as 'small and pilot-based' (Dohong et al., 2018) and remain in an early phase of development (Page et al., 2009a; Dohong et al., 2018; Kiely et al., 2021). Several studies present findings regarding the challenges encountered in efforts to restore peat, including high costs (Hansson and Dargusch, 2018; Kiely et al., 2021; Sari et al., 2020); social and institutional issues such as governance or institutions (Januar et al., 2021; Puspitaloka et al., 2021), lack of knowledge about peatland ecosystem (Lestari et al., 2021), and differing goals among stakeholders (Fleming et al., 2021); as well as ecological issues including the complex nature of peatlands, floods, droughts, and fires (Dohong et al., 2018; Fleming et al., 2021; Page et al., 2009b; van Eijk et al., 2009).

Table 2 summarises the lessons learned for stakeholder involvement and their perception of activities related to peatland restoration projects. The first example is from the Central Kalimantan Peatland Project (CKPP), one of Indonesia’s first peatland restoration projects. A report by van Beukering et al. (2008) found that while farmers recognise the importance of CKPP’s peatland conservation measures for future generations, they fear it could harm their welfare without compensation. They rely on agriculture, and interventions like canal blocking and fire bans by CKPP could significantly impact their productivity. Although located in the same province, stakeholders in the Kalimantan Forest Climate Partnership (KFCP) project had different concerns. Communities worried about revenue distribution and land ownership, which was settled by establishing a village settlement. The local government, however, felt excluded from decision-making (Atmadja et al., 2014). Another example is from RIMBA MCA-I project in Jambi Province, who conducted their activities with actively consulting not only the local communities, government institutions, and academics, but also the private companies whose concessions located surrounding their project site. Suryadiputra et al. (2018) found that at the conclusion of the project, local communities expressed their hope to participate in future peatland restoration activities beyond the project funded by MCA-I.

Riau Ecosystem Restoration (RER) and Katingan Mentaya Project (KMP) hold ecosystem restoration concession (ERC) permits, and their business is still ongoing today. Langston et al. (2019) reported that RER initially used excellent science to create plans for conserving biodiversity, but these plans failed to have an impact because they didn't consider the immediate needs and decision-making processes of local land managers. RER then increased collaboration with local landholders. The presence of long-term funding commitments also became an added value of this project. Despite periodic reports from APRIL, these reports did not specifically address social challenges, and no other publicly available literature details stakeholders' perceptions of RER. KMP is currently the largest tropical peatland restoration project using a business approach, aiming to restore degraded peat ecosystem to their original state. One of the measures taken is the establishment of climate smart agriculture involving the local farmers. A study by Darusman et al. (2021) found that local stakeholders and land-use changes outside the KMP area continuously influence the restoration activities, prompting KMP management to remain adaptive and innovative.

Table 2. Lessons learned from past and on-going restoration projects in various locations in Indonesia.

No.	Project name	Category	Project proponents	Implementation period	Location	Lessons learned
1	Central Kalimantan Peatland Project (CKPP)	Project-based (cooperation between government and donor)	CARE International-Indonesia, WWF-Indonesia, BOS-Mawas, University of Palangka Raya, Wetlands International Indonesia Programme	2005 - 2008	Central Kalimantan Province	• Local communities are in favour of peatland reforestation efforts but raise doubts about CKPP's conservation strategies (van Beukering et al., 2008) • Increasing awareness about the ecosystem services provided by peatland may help to gain more local support (Schaafsma et al., 2017) • Compensation for farmers is essential to end unsustainable practices and forest use (Schaafsma et al., 2017; van Beukering et al., 2008)
2	Kalimantan Forest Climate Partnership (KFCP)	Project-based (cooperation between government and donor)	Indonesia–Australia Forest Carbon Partnership (IAFCP)	2010 - 2014	Kapuas District, Central Kalimantan Province	• Absence of clear objectives (Davies, 2015) • Surveyed households' concerns were centred around benefit sharing and land tenure (Atmadja et al., 2014) • District government felt left out from the decision's making processes (Atmadja et al., 2014; Davies, 2015) • Lack of political support due to internal power struggle within domestic Australian political environment (Atmadja et al., 2014)
3	RIMBA MCA-I Program (part of Berbak Green	Project-based (cooperation between	WWF Indonesia and Millenium	2016 - 2018	Jambi Province	• The community expressed their interest to be involved in other restoration activities after the project concludes (Suryadiputra et al., 2018)

No.	Project name	Category	Project proponents	Implementation period	Location	Lessons learned
	Prosperity project)	government and donor)	Challenge Account Indonesia (MCA-I)			• Infrastructure maintenance (i.e., canal blocks, early warning system) and further monitoring of revegetation result need to be carried out as a part of projects' exit strategy (Suryadiputra et al., 2018)
4	Restorasi Ekosistem Riau (RER)	Concession holder	Asia Pacific Resources International (APRIL) Group	2013 – now (60 years permit)	Kampar Peninsula and Padang Island, Riau Province	• Initial attempts at landscape planning failed because it did not meet the needs of local land managers (Langston et al., 2019) • Scientists acted as intermediaries among stakeholders to ensure harmony between the specific needs of the local landscape and wider sustainability goals (Langston et al., 2019) • Long-term and secure financing along with technical support from wide range of expertise are key to positive progress (APRIL, 2023)
5	Katingan Mentaya Project (KMP)	Concession holder	PT. Rimba Makmur Utama, Permian Global	2013 – now (60 years permit)	Central Kalimantan Province	• Large upfront investment and delayed issuance (ERC licence due to policy limiting ERC issuance to 50,000 ha per licence, up to two licences per company (Indriatmoko et al., 2014) • Inconsistency between political/economic factors in ERC licence boundary setting and the ecological need to protect whole peat domes (Indriatmoko et al., 2014) • Aiming to be adaptive to accommodate the dynamics of human and nature interrelationships (Darusman et al., 2021) • The establishment of climate-smart agriculture as a sustainable and profitable alternative has yet to be fully achieved, challenged by sceptical views from some community members (Darusman et al., 2021).

Note: the information in the table above is gathered from various source.

Several authors have recognised opportunities to support peatland restoration efforts in Indonesia. For example, a study by Lestari et al. (2021) found out there is a willingness among the community in their case study to be involved, as they have suffered greatly from peatland fires in the past. Additionally, the adoption of agro-silvofishery farming practices (Budiman et al., 2020) and collaboration between the public and private sectors to invest in long-term restoration projects (Puspitaloka et al., 2021) can potentially contribute to the restoration efforts. Globally, peatlands in Indonesia attract significant attention, presenting another opportunity for restoration efforts. They first gained international focus in 1997/98 during the extensive fires in the former Mega Rice Project (MRP) area in Central Kalimantan (Jefferson and Carmenta, 2017; Page et al., 2002), and garnered even greater attention during the forest and land fires in 2015 (ABC News, 2015; Cochrane, 2015; UNEP, 2018). In the subsequent year, several developed countries expressed their willingness to assist Indonesia in restoring the burned peatlands and conserving the unaffected areas (TEMPO, 2016).

2.3.2 Current knowledge of peatland restoration project completion

Various lessons, both positive and negative, can be drawn from the examples presented in Table 2. Since this research focuses on project-based peatland restoration, this section will examine what happened after these projects were completed, based on publicly available reports.

CKPP was completed in 2008, and a provisional report from the CKPP Consortium (2008) revealed that the community-based approach significantly improved land use management in target areas through peatland restoration and conservation. The report emphasised the urgent need for a long-term sustainable funding mechanism to ensure financial security for local stakeholders to transform their livelihoods. Based on the lessons learned from CKPP, they provided several post-project suggestions, including the formation of a Master Plan as a 'living document' for the rehabilitation and revitalisation of ex-MRP areas. Another suggestion is to establish coordination among donors to synergise estoration efforts, thereby avoiding duplication and overlap between projects. Unfortunately, the document is very lacking in terms of concrete measures or follow-up action post-project. There was no mention of who would take over the project or what kind of mechanism would be available for monitoring and maintaining the project infrastructure.

The fate of KFCP clearly illustrates the failure to restore the peatland ecosystem at the project site, with no information available regarding post-project maintenance efforts. The canal blocking component was cancelled due to criticism and arguments with the local scientists' group, and only 50,000 trees were planted out of the initial target of 100 million (Atmadja et al., 2014; Olbrei & Howes, 2012). According to several reports, KFCP was terminated between mid-2013 and 2014 after disbursing more than A$30 million, even before fulfilling its central objective of using performance-based payments to achieve quantified emission reductions (Atmadja et al., 2014; Davies, 2015; Rosenberg and Wilkinson, 2013). Several factors contributed to this, including numerous negative or critical views of

KFCP due to delays and a lack of transparency, as KFCP did not widely publicise its activities until two years after the program began. This issue was exacerbated by internal political issues in Australia, leading the Australian Government to redirect funding to other programs (Atmadja et al., 2014; Davies et al., 2015).

The evaluation report of the Green Prosperity project, which oversees the RIMBA MCA-I project in Jambi, raises concerns about the absence of a concrete maintenance plan, despite meeting peatland rewetting targets and benefiting communities through grants (Integra LLC, 2019). This omission is considered short-sighted, assuming communities will voluntarily take on maintenance without structured support. The report estimates that the cost of monitoring and maintaining the canal blocks and revegetated areas will exceed US$360,000 over 20 years. Furthermore, the document does not specify which government institution took over the project's assets, but ideally, the provincial forestry service should be responsible, given that the restoration activities occurred in a protected area.

2.4 Summary

The literature review provides information about peatland ecosystems in Indonesia, its governance, and efforts to restore degraded peatland, including lessons learned from past and ongoing project-based restorations. Despite the acknowledged importance of peatland ecosystems in Indonesia for ecological, social, and economic reasons, existing regulatory frameworks have yet to effectively address the ongoing threats faced by these ecosystems from various direct and indirect drivers. Collaborative restoration efforts involving multiple stakeholders have been underway for over a decade and became more sporadic following the 2015 fires. However, these initiatives have primarily taken the form of pilot projects that are small-scale and have relatively short implementation periods (3 to 5 years), except for those utilising a business approach through Ecosystem Restoration Concessions (ERCs), which can last up to 60 years.

Restoring these ecosystems requires ongoing commitment because recovery happens slowly. Insights from previous projects reveal significant challenges related to governance, politics, and financing, while also emphasising the importance of ensuring sustainable outcomes. This includes securing ongoing financial support and clearly defining stakeholder accountability. Publicly available reports on these projects primarily offer recommendations for minimising challenges and outline next steps following project implementation but lacks comprehensive information on the experiences and developments of Indonesia's peatland restoration efforts post-project. This chapter establishes the foundation for this study to investigate the restoration project stakeholders’ goals following the completion of restoration projects, and the actions they believe are necessary to achieve these goals.

Chapter 3

Methodology

Seedlings of swamp jelutung (*Dyera polyphylla*) grown by local communities to support revegetation activities. Jelutung is endemic to Indonesia's peatlands and is one of the key species used to restore vegetation cover in degraded peatlands.

Chapter 3: Methodology

3.1 Case study approach

This study aims to investigate the perspectives of various stakeholders in Jambi Province, Indonesia, regarding the implementation of a peatland restoration project and efforts to ensure its sustainability after the project concludes. I use case study approach in this research. The case study approach is defined by Feagin et al. (1991) as "an in-depth, multifaceted investigation, using qualitative research methods, of a single social phenomenon”. The social phenomena studied through a case study approach can vary, ranging from an institution, a city, to a group of people.

In this research, I studied the *Restoration of Burnt Peatland in Jambi* project, as explained in Section 1.3. This project was chosen because it is currently in its final year of implementation. This timing makes the project an appropriate focus for addressing research questions related to the stakeholder’s perspectives on the sustainability of post-project peatland restoration efforts.

3.2 Study location

The site of this research project is in Muaro Jambi and Tanjung Jabung Timur District of Jambi Province, Indonesia, corresponding to the implementation site of the *Restoration of Burnt Peatland in Jambi* project. Jambi Province, which is home to 9,42% of the total peat ecosystem area on the island of Sumatra, Indonesia, is one of the provinces that is prone to the risks of fire (Directorate of Peat Degradation Control MoEF, 2017). It is one of the seven provinces that are given high priority for peat ecosystem restoration by BRGM (Republic of Indonesia, 2016).

Jambi's peatland ecosystem was among those affected by the 2.6 million hectares of fire damage in 2015, as noted in Section 2.1.3. Responding to this environmental crisis, the Government of the Republic of Korea funded the *Restoration of Burnt Peatland in Jambi* in the form of an ODA project as a part of bilateral cooperation between the two countries. The project is located within Londerang Peat Protected Forest.

Londerang was officially designated as a protected area according to the Ministry of Forestry's Decree No. 727/Menhut-II/2012, subsequently amended by Ministry of Forestry's Decree No. 863/Menhut-II/2014, encompassing a total area of 12,484 hectares. Geographically, the Londerang Peat Protected Forest, commonly referred to as Hutan Lindung Gambut or HLG Londerang, spans from S1°08’34” to S1°24’38” in a North-South direction and from E103°42’45” to E104°5’29” in a West-East direction, situated within the administrative boundaries of Tanjung Jabung Timur District and Muaro Jambi District (Figure 1). HLG Londerang is also part of the Mendahara-Batanghari peat hydrological unit (PHU) which has been subject to repeated wildfire outbreaks during the extreme dry season.

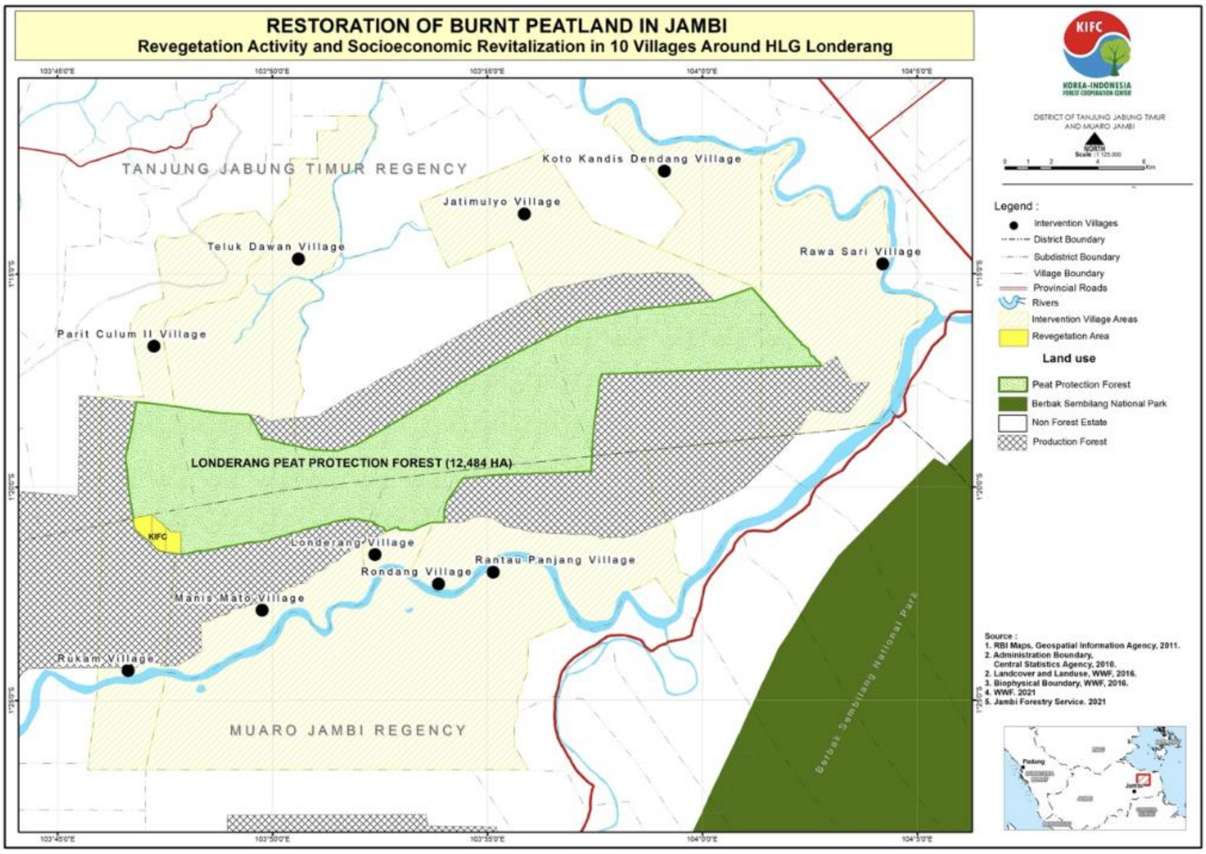

Figure 4. The project area in HLG Londerang, involving ten villages across two districts (source: KIFC).

The execution of this initiative is overseen by the Korea-Indonesia Forest Cooperation Center (KIFC) as the project management unit and the Directorate of Peat Degradation Control (PKG) of Indonesia's MoEF as the executing agency. This project employs a 3R approach (rewetting, revegetation, and revitalisation), a widely adopted peat ecosystem restoration principle in Indonesia and other countries in Southeast Asia as discussed in Section 2.2 (Dohong, 2017; Terzano, 2022). In 2022, 19 canal blocks and 12 water level data loggers (WLDLs) were installed as part of the rewetting activities. For revegetation, the project covered an area of 200 hectares within HLG Londerang. A total of ten villages from both Tanjung Jabung Timur and Muaro Jambi Districts, surrounding the landscape, were targeted for livelihood revitalisation. In addition to the 3R activities, the project established a Peatland Education Centre in Kenali Forest.

With a dedicated budget totalling 3 million USD, the project's timeframe was initially defined from 2019 to 2022 in alignment with the initial Memorandum of Understanding (MoU). However, the active field implementation was extended beyond the stipulated period, until the end of 2024.

3.3 Data collection and analysis methods

In this research, I used several methods to collect primary data, comprising semi-structured interviews and field and participant observation. A literature review was conducted prior to data collection (Chapter 2), to identify research gaps and to address the first research question. While the second, third, and fourth research questions are answered using data collected during the fieldwork I conducted for one month in June and July 2024. The research was approved by the ANU Human Research Ethics Committee (Protocol H 2024/0659) and the Ethical Committee on Social Studies and Humanities of Indonesia's National Research and Innovation Agency (No. 375/ KE.01/SK/05/2024). Documents for participants, comprised of a Participant Information Sheet, list of guiding questions, and consent form, can be found in the Appendices.

3.3.1 Semi-structured interviews

Semi-structured interviews are the preferred data collection method when the researcher's goal is to better understand the participant's unique perspective rather than a generalised understanding of a phenomenon (McGrath et al., 2019). The selection of interviewees was conducted through purposive sampling based on secondary data obtained from the KIFC database and divided into five categories of stakeholders: local community, project donors, government institutions, research and university representatives, and NGOs. Participants are named according to the stakeholder group they belong to: C for local community members, P for project donors, G for government institutions, A for academics, and N for NGOs (see Table 3). The guiding questions were open-ended to facilitate organic discussions and were tailored to the specific types of stakeholders (see Appendix 1 for details).

A summary of my research project and informed consent forms were provided to the interviewees prior to the interviews. Considering the cultural context in Indonesia, some participants may have perceived signing a consent form as sensitive, potentially indicating a lack of trust. Therefore, oral consents were obtained from participants who preferred not to provide written consent.

I conducted 22 interviews, with 21 being in person and one via a Zoom meeting. Three interviews were conducted in Jakarta with representatives from KIFC as the project donor/project management unit and BRGM, while the remaining interviews were conducted in the province of Jambi. Village 1 in the northeast of HLG Londerang and Village 2 in the southwest of the landscape were selected to represent the Tanjung Jabung Timur and Muaro Jambi Districts, respectively. These are the two districts where HLG Londerang is located. I had the opportunity to stay for 2 days and 1 night with a member of the local communities during each of my visits to Village 1 and 2, where I collected data from the local communities. The interviews with stakeholders from the government, research/university representatives, and NGOs were conducted in various locations in Jambi City.

Table 3. List of interview participants, their affiliations, and involvement in KIFC peatland restoration project (n = 22)

Type of stakeholders	Code	Affiliation	Gender (M/F)	Involvement with KIFC project
Local communities	C1	Village 1 (Head of TKPPEG)	M	Yes
	C2	Village 1	M	Yes
	C3	Village 1	M	Yes
	C4	Village 1 (Head of village)	M	No (previously involved in WWF RIMBA MCA-I project)
	C5	Village 1	F	Yes (indirectly)
	C6	Village 2 (Member of TKPPEG)	F	Yes
	C7	Village 2 (Member of TKPPEG)	F	Yes
	C8	Village 2 (Head of TKPPEG)	M	Yes
	C9	Village 2	M	No (previously involved in BRGM & WWF RIMBA MCA-I project)
Project donors	P1	KIFC	M	Yes
	P2	KIFC	F	Yes
Government officials	G1	MoEF	M	Yes
	G2	Jambi Provincial Forestry Service	M	Yes
	G3	Muaro Jambi Forest Management Unit	M	Yes (only in the planning stage)
	G4	Jambi Provincial Environmental Service	F	Yes
	G5	Directorate of Peat Degradation Control, MoEF	M	Yes
	G6	BRGM	M	No

Type of stakeholders	Code	Affiliation	Gender (M/F)	Involvement with KIFC project
Academia (research/university staff)	A1	University of Batanghari	F	No
	A2	University of Jambi	M	Yes
NGOs	N1	KKI Warsi	M	No
	N2	WWF RIMBA MCA-I (ex-project team)	M	Yes (only in the planning stage)
	N3	Pantau Gambut	M	No

I initially planned to conduct semi-structured interviews with individual, pre-selected interviewees identified through purposive sampling. However, the actual experience of conducting the interviews in the field was different, particularly when interviewing local community members or villagers. During the nine interviews I conducted—five in Village 1 and four in Village 2—uninvited members of the community frequently joined the interview sessions. These additional participants were typically neighbours, close relatives, or spouses of the primary interviewee. The data recorded in the interview transcripts were focused only on the primary interviewee, and comments made by the additional participants were recorded in my field notes, which I also draw upon in my analysis.

3.3.2 Field and participant observation

The inclusion of field and participant observation is crucial to gain firsthand insights by observing the project's implementation and the dynamic interactions among stakeholders on the ground. I documented my observations through field notes and photographs (landscapes and infrastructures related to the case study project), obtaining permission as necessary.

During my first week in Jambi, I had the opportunity to attend the stakeholder meeting for "*Exposure of the Draft of Provincial Peatland Ecosystems Protection and Management Plan (RPPEG)*" as an observer. This provincial RPPEG document is prepared in accordance with the mandate of Government Regulation No. 17 of 2014 which was amended by Government Regulation No. 57 of 2016 on the Protection and Management of Peatland Ecosystems and will be valid for 30 years from 2024 – 2054. To refine the document and align it with the Jambi Provincial Government's planning documents and development programs, relevant stakeholders were invited to the meeting. There were around 30 attendees which include representatives from various government institutions, NGOs, the private sector, researchers, restoration project teams, and journalists, all in the context of Jambi Province. I recorded my observations via notetaking during the speaker's presentation, panel discussion, and discussion sessions. I also conducted observations while staying in the village and during three visits to the revegetation site in HLG Londerang together with the KIFC team.

3.4 Qualitative data analysis

I used a thematic analysis approach to analyse the qualitative data from interviews and observations. The audio recordings from the interviews conducted during fieldwork were transcribed into written form before being analysed. For two interviews conducted in English, I used the AI transcription tool Otter.ai, while the other 20 interviews in Bahasa Indonesia were transcribed manually. The personal identities of all respondents were kept confidential by assigning codes based on stakeholder category. However, their affiliations were mentioned because, based on the written consent forms signed and oral consent obtained during the informed consent process, all participants agreed to have their institutional or organisational affiliations disclosed.

I then created a matrix spreadsheet using Microsoft Excel to summarise the interview results. Coding was carried out using themes and subthemes that formed the structure of the research questions. The 'codes' were keywords that appeared in the interview transcripts and were more specific than the themes, and they were nested into the pre-existing subthemes. Any new findings outside of the pre-determined themes and subthemes that provided interesting insights and were still aligned with peatland ecosystem restoration in general were recorded under 'other findings.'

Chapter 4

Results

A villager cuts areca nuts (*Areca catechu*) for drying before selling them to middlemen. Areca nut is widely cultivated in several areas of Jambi as it thrives on peatlands, but it is increasingly being replaced by oil palm due to low market prices and floods that have devastated many areca palms.

Chapter 4: Results

This chapter presents stakeholders' perspectives on the value of peatlands, their goals after the completion of restoration projects, and the actions or factors they consider necessary to achieve them, as obtained from interviews and field and participant observation. It first describes the stakeholder responses based on the themes that emerged from the interview data and field notes. Subsequently, it presents a summary based on the interview and observation results for each type of stakeholder. Participants are coded according to their stakeholder group: C for local community members, P for project donors, G for government institutions, A for academics, and N for NGOs (see also Table 3 in Chapter 3). Although this research is focused on the KIFC project, stakeholder perspectives captured in the interviews and field and participant observations also encompass restoration projects carried out by other institutions in the HLG Londerang landscape, such as BRGM, WWF RIMBA MCA-I[2], and BioCarbon Fund[3], reflecting stakeholders' experiences with these projects.

4.1 Understanding perceived values, risks, and stakeholder interactions in peatland ecosystems

During the interviews, almost all participants stated that peatlands (locally known in Indonesia as *gambut*) are important in various ways, and they interact with peatlands differently, which is reflected in how they define the value of peatlands. The themes that emerged from interviews were: livelihood (agriculture & fisheries), global biodiversity (wildlife corridors and migratory birds), ecosystem services, hydrology (water reservoir, storage, and regulation), carbon sinks and sequestration, shifting paradigms towards peatland, global climate agenda, and research. These themes are explained in detail in Sections 4.1.1 to 4.1.3. The risks of peatland degradation were also explored during the interviews, and the results are further explained in Section 4.1.4.

Only three participants (C5, C6, and G1) not stating this explicitly. C5, who resides Village 1, mentioned having heard about peatlands because her relatives work on the KIFC project, and she herself participated in training for a women's group provided by the RIMBA MCA-I restoration project (see Section 2.3.1) in the past, but has never been to HLG Londerang. C6, who lives in Village 2, stated that peatlands cannot be cultivated because they sink when stepped on, although she does not know for sure about the soil's fertility. G1, a staff member of MoEF, learned about HLG Londerang after being assigned to the KIFC project, but he is familiar with conservation areas, including protected forests.

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[2] Restoration project implemented by WWF Indonesia and Millenium Challenge Account Indonesia (MCA-I), see Section 2.3.1.
[3] Public-private sector initiative managed by the World Bank, supports projects reducing greenhouse gas emissions through sustainable land use.

4.1.1 Communities' livelihoods

The question, "*How can we protect the environment with empty stomachs?*" posed by Participant C3, underscores a critical perspective on the relationship between livelihood and environmental restoration.

The two villages I visited and observed in this research have distinct characteristics, but their sources of income are closely tied to the peatland ecosystem. Village 2 is inhabited by the Malay ethnic group, one of the indigenous groups residing in Jambi Province and the Sumatra region in general (Redacted, 2022). Based on interviews with key informants residing there (C6, C7, C8, and C9), the majority of the village's residents were traditionally fishermen. However, village profile data from 2021 shows that most residents of Village 2 are now private sector employees. Informants mentioned that in recent years many villagers earn their income by working as plantation workers for an oil palm concession, located directly adjacent to their village. One interviewee said:

> "The land behind our village started being developed as an oil palm plantation in early 2000s, and the villagers began to work there." - Participant C8.

When asked about their understanding and awareness of peatlands, participants C6, C7, C8, and C9 all provided similar responses, regarding the drastic decline in fish catches from the Batanghari River following the conversion of peatland behind their village into oil palm plantations, the construction of embankments, and waste disposal activities. C6 and her husband have a small fishpond at their home for farming gourami (*Osphronemus gouramy*) because the catch of wild fish is unpredictable. C9, who is also a worker at the oil palm concession, stated that people are more enthusiastic about working for the palm oil company than fishing. During my visit in June, I observed C8's wife processing their fish catches into fish crackers to extend shelf life and increase market value. C7 noted that the number of salted fish artisans, once abundant in Village 2, has significantly decreased, although her parents continue to produce serapil (*Helostoma temminckii*) salted fish which according to her still has a strong market demand:

> "The number of salted fish artisan is not as many as before because our fish catches are not abundant anymore, but thankfully my parents are still producing. It sells well at IDR 90,000/kg." - Participant C7

In contrast to Village 2, Village 1 was originally a transmigration settlement established in 1978/1979 (Redacted, nd). The transmigrants primarily consisted of people from Java Island (including Sundanese, Javanese, and Betawi ethnic groups) and Bugis people who migrated from Riau Province. The majority of residents in Village 1 work as farmers and agricultural labourers (41%), with oil palm, rubber, and areca nut as the main commodities. This explains why participants C1 and C2 who reside in Village 1 expressed their familiarity with peatlands through their understanding of the physical properties of this ecosystem. C1 mentioned that peatlands in Riau are more fertile than those in Jambi, while C2 stated their belief that the more frequently peatlands are flooded, the faster they transform into mineral soil.

4.1.2 Ecosystem services and biodiversity

Several participants mentioned terms associated with ecosystem services and biodiversity provided by peatlands. Participant G4 described peatland as "*a place for genetic resources*". Participants C1, C2, and C3, who are all involved in small businesses producing tree seedlings, mentioned that they have been collecting seeds and wild seedlings of swamp jelutung (*Dyera polyphylla*) and swamp pulai (*Alstonia pneumatophora*) from the peatland area located in the heart of Berbak National Park near their village, *"We went deep into the heart of Berbak National Park searching for seed sources, trekking for days until we finally found a jelutung tree so big that it took five grown men to wrap their arms around its trunk."* - Participant C3. These two species are used as the primary species for the peatland restoration project.

Participant A1, who works as an academic, used the example of Berbak National Park, which is the first Ramsar site of Indonesia. A1 mentioned that this landscape earned the title due to its significance as an important habitat for migratory birds:

> "...it has an important value in biodiversity, and it is also one of the ecosystems for migratory birds; it is one of the instances why the peatlands ecosystem in Jambi is very important for global biodiversity." - Participant A1

Additionally, participant N2, who previously worked for the RIMBA MCA-I project, emphasised the importance of HLG Londerang as a part of the wildlife corridor of Berbak - Sembilang National Park.

Participants G2 and G5 highlighted peatland as it serves a protective function for biodiversity and water storage. They described its characteristic as "*somewhat similar to a sponge".* Several terms related to hydrology also emerged, such as 'water reservoir' mentioned by participant A2, an academic from University of Jambi, 'water storage' by G2, and 'water regulation' by N2. A1 emphasised pristine peatland must be in a waterlogged' conditions.

Carbon is mentioned several times by participants, both in ecological and economic contexts. 'Carbon sink' and 'carbon sequestration' are noted as important features of peatland by A2 and G4 as seen from the example:

> "Very important, peatland landscapes are not only for protecting flora and fauna but also for carbon and water reservoirs." - Participant A2

N1 stated that “*carbon storage in peat is higher than in mineral soil*,” which is consistent with several references cited in Chapter 2. N3 noted that “*peatlands are important because they are closely linked to climate change mitigation and are inseparable from carbon*.” P1, a member of the KIFC project team, explained that one of the reasons the Government of Korea is contributing to peatland restoration is their interest in studying carbon dynamics, given that peatland burning is closely associated with carbon emissions.

Discussions about carbon also revolves around carbon credits during the visit to Village 1. Participants C1, C2, and C3 expressed enthusiasm about the potential of peatlands for developing carbon projects, based on information they had received from external sources (which were not specified). However, C1 indicated uncertainty by stating that he is “*confused about how to calculate carbon and put a price on it, especially since it is invisible*." G2 provided insights into the ongoing result-based payment revegetation activity in HLG Londerang, which is implemented by the BioCarbon Fund, part of World Bank initiative.

4.1.3 Global climate agenda

Two interviewees stated that peatlands are associated with the global climate agenda. N3 highlighted the importance of peatland to mitigate climate change. Beyond the ecological benefits, P1 viewed the restoration project from a diplomatic perspective, emphasising that peatland issues are significant not only for cooperation between his country and Indonesia but also on a global scale:

> “Indonesia is one of the most important partner countries for forestry cooperation in Korea. Peatland burning is not only important for Indonesia or the Korean government (to address), but also at the global level, so we chose that agenda." - Participant P1

4.1.4 Existing risks to HLG Londerang and the surrounding communities

Fires are highlighted as the number one risk by all interviewees, and G4 believed that El Niño played a major factor. G1 argued that fires are only the ‘surface’ with the real risk being the human dimension or anthropogenic cause, “*the reasons why people burn land need to be addressed*”. G6 added that forests will inevitably be pressured by the progression of time, but the concept of sustainability remains the primary principle in their management:

> “Philosophically, forests will inevitably be pressured by the needs of the times. However, how that pressure is managed should adhere to principles that ensure environmental sustainability.”
> - Participant G6

All interviewees residing in Jambi (n=18) had firsthand experience with peatland fires and haze, with the fire events in 2015 and 2019 being the most prominent in their memory. G2 believed that attention towards peatlands increased after the fires in 2015 and 2019, and P2 recalled how the disaster affected everyone—schools were closed, people couldn't go to work, and flights were disrupted. Other fire events, such as those in 2017 and 2023, are considered "small and sporadic," based on the experiences of G2 and G3, "*In 2023, only 250 hectares burned. I participated in the firefighting efforts last year. A nearby industrial plantation had a standby helicopter, and the Local Disaster Management Agency (BPBD) was on standby for emergency response*" - Participant G3. This is further supported by A2's statement about the significant decrease in fires due to the widespread implementation of the fire prevention task force.

Fires are seen by some participants as the aftermath of anthropogenic causes including 'land clearing', 'land conversion', 'encroachment', 'illegal logging', and 'canals'. Land clearing using fires according to C8, P1, N1 and N3 are still common practices. C8 as a member of the communities blamed the private companies *"It's impossible for just one person to set the fire here, so how could it spread so quickly? It's the companies doing it on purpose because managing the land by burning is easy and cheap... after that, they just clean it up".* While P1, N1, and N3 believed that traditional practice of slash and burn called 'merun' is still performed by the locals with a particular reason for making the soil more fertile before used for agriculture.

Land conversion and encroachment for agriculture were mentioned by C8, P2, N2, N3, and G1. C8 shared a story that back in the 1980s, he could hear the calls of wild siamang gibbons (*Symphalangus syndactylus)* from the peatland area across from his house, a presence he has not encountered since the peatland was converted to other land uses managed by private companies.

> "A long time ago, before there were any companies, the calls of siamang could be heard from across here." - Participant C8

N3, a staff member of Pantau Gambut, shared a joint position paper created in collaboration with Greenpeace Indonesia and Transformasi untuk Keadilan (TuK) Indonesia as part of their advocacy addressing the issue of amnesty granted by the Government of Indonesia to illegal palm oil companies. Encroachment, in a form of illegal practice of selling social forestry permits for settlements, was highlighted by an informant who participated in the interview with C1, *"Many social forestry permits have been sold, with one plot of land going for 7-8 million rupiah. The buying and selling of social forestry land has caused conflicts involving three different parties (A gets the permit, A sells it to B, B then sells it to C). This leads to overlapping claims. Behind [redacted] oil palm concession, there are a lot of new huts as the land was bought by Balinese transmigrants who came from Lampung, possibly unaware of the legal status."*

Other illegal activities posing a risk to HLG Londerang is illegal logging, coming from KKI Warsi's experience shared by N1 as follows.

> "Previously, KKI Warsi had an assistance program in Kota Kandis Dendang Village, where there was a high rate of deforestation and illegal logging activities. Then, the 'toke kayu' (illegal timber middlemen) threatened our field facilitators, so now we are no longer involved in Londerang." - Participant N1

Participant N3 acknowledged how 'climate change' is threatening peatlands, and N2 believed that the landscape is experiencing drought due to both climate change and drainage construction. Similarly, G5 noted "*the more channels and drains there are, the more water is drained out, causing the peat to sink or subside*". The presence of industrial plantations is also considered a threat by N3 due to their role in monopolising water use and causing the spread of the invasive species *Acacia crassicarpa* in the HLG Londerang landscape.

P1 emphasised that all the aforementioned risks not only harm humans but also affect wildlife by causing habitat loss. P2 shared stories about human-wildlife conflicts in some villages near HLG Londerang, such as crocodiles frequently seen in canals close to residential areas and Sumatran tigers appearing in plantations, with some instances resulting in casualties.

4.2 Defining restoration

Understanding how stakeholders define peatland restoration is a crucial step in identifying their expectations and goals. A1 highlighted a paradigm shift in peatland management in the late 1990s, marked by the entry of some institutions into Jambi to conduct research on the causes of fire. According to A1, this shift involved "*moving from managing peatlands for intensive agriculture—due to a lack of understanding or research evidence on the risks of dry peatlands—to focusing on preservation and conservation after the fires of 1997-1998.*" The diversity of responses from stakeholders is illustrated and discussed in Sections 4.2.1 and 4.2.2.

4.2.1 The goals of restoration

Only one community member, C3, explicitly described the purpose of restoration. Based on his experience with several programs, C3 believed that restoration aims to repair the damaged environment. The remaining community member expressed hope that restoration will prevent fires from happening again in the future.

G4 and G6 referred to BRGM's restoration objective (Section 2.3), which aims to restore the ecosystem to its optimum condition. A1 viewed Indonesia's restoration efforts as a means to fulfil its obligations as a member of the ASEAN Agreement on Transboundary Haze Pollution. In a critical tone, A1 further argued that none of the restoration projects implemented thus far can truly be called restoration, but rather 'rehabilitation' as it is impossible to return degraded peatland to its pre-degraded condition, *"...we just try to fix the properties like improving the water level, vegetation or land cover* *(biophysics), but we can't restore the natural state of peatlands."* P1 viewed the KIFC restoration effort as a pilot project:

> "it's part of Official Development Assistance (ODA), so we want to motivate our stakeholders to take care of peatlands, and not fulfilling 100% of what our target country needs".

P2, G1, and N3 emphasised that restoring the hydrological condition of peatlands through rewetting is the primary goal they aim to achieve, among other components of the 3R approach.

> "Rewetting should be the top priority, followed by revegetation and then the socio-economic revitalisation of the surrounding communities."-Participant G1

P2 also expressed her hope that peatland restoration would restore habitats for wild flora and fauna, which in turn could reduce the frequency of conflicts between wildlife and local communities in surrounding villages.

4.2.2 Balancing ecological, social, and economic priorities

The peatland restoration approach using the 3R concept (see Section 2.2) aims to maintain a balance between ecological, social, and economic needs. This theme emerged several times during discussions with participants. Associated terms were 'maintaining balance', 'integrating factors beyond revegetation', and 'everything needs to work together'. Opinions expressed by G1, G2, G5, G6, and P1 emphasised that they viewed this concept not only as a guiding principle but also as the goal of restoration. Incorporating social forestry to support restoration was highlighted by G2 and he shared recent stories of social forestry permit issuance to three villages surrounding HLG Londerang.

> "Everything needs to work together—ecology, economy, and social aspects. For example, social forestry is one way to integrate these elements effectively." - Participant G2

P1 reflected to when the project was initially being designed, the main concept of restoration was focused on revegetation. However, along the way, it became clear to the stakeholders from the Korean side that restoration encompassed not only revegetation but also rewetting and revitalisation (3R). He also noted that the MoEF was promoting the 3R approach as a standard for restoration projects, "...*the Vice Minister Alue Dohong is a specialist of peatland restoration, and he has issued many books about it (3Rs), so I believe MoEF is mainstreaming this approach for restoration project.*"

An informant from Pantau Gambut proposed the idea of expanding the 3Rs concept by adding 'reducing fires' and 'reporting and monitoring', consistent with the 5Rs concept introduced by Terzano et al. (2022).

4.3 *Project implementation overview*

The KIFC project is divided into four main activities, which include 3R activities and the establishment of a Peatland Education Centre (explained in Section 3.2). In its implementation, MoEF serves as the executing agency and KIFC as project management unit, collaborating with various stakeholders at both provincial and village levels.

The infrastructure development for rewetting in other land use areas involves the Jambi Environmental Service and a third-party contractor. The revegetation activities include researchers from the Environment and Forestry Standard and Instrument Agency (BSILHK, previously known as the Environment and Forestry Research and Development Agency) as technical design consultants, along with the Forestry Service and field workers from several villages, including Village 1 and Village 2. The socio-economic revitalisation of village communities involves the University of Jambi as the field coordinator (responsible for selecting community facilitators & regular monitoring), village authorities, and representatives from local communities in each village who are part of a community working group called TKPPEG. TKPPEG received training related to the livelihood activities proposed in each village. Officially, there are 15 and 17 members of TKPPEG in Village 1 and Village 2, respectively; however, many non-members also participate in the KIFC project activities. The development of the education centre involves a third-party developer, with the Forestry Service as the main partner since the land used falls within their working area.

4.3.1 Perceived outcomes

According to P1, the project was recognised and awarded as one of the distinguished ODA projects by the Government of Korea in 2022. Six participants (C5, P1, P2, G3, A2, N2) stated that the KIFC project outcomes have met their expectations. They observed that the KIFC project could address two among many challenges faced by stakeholders in other similar projects: the uneven distribution of aid related to socioeconomic revitalisation activities, and the maintenance of planted trees at revegetation sites. C1, C2, and C5 expressed their gratitude for the assistance they received from the project in establishing chicken farming, black soldier fly (BSF) larvae cultivation (for chicken feed), and tilapia fishponds as alternative livelihoods, as it was their first time:

> “I am grateful for the KIFC program... this is the first time this particular part of Village 1 has received such activities, usually Block O is the centre of activities.” - Participant C1

P2, G1, G2, G3, and G4 reported that the results of the KIFC revegetation efforts were very positive, noting that the project had achieved maintenance in the second year after planting (commonly referred to as P+2). P2, with experience in several restoration projects since 2016, initially anticipated the KIFC project to be similar to previous ones. However, she found that the results were better, as shown in the following quote:

> "Initially, I was skeptical that the KIFC project would be the same as other projects, but it turned out that it reached the P+2 maintenance stage (with a high survival rate)."- Participant P2

P1 shared results from geotagging conducted in 2022 indicated a survival rate of 96%. KIFC attributed this improvement to use of technical designs from scientists at BSILHK, which included techniques such as circular weeding and peat mounding before planting the seedlings.

While the perspective of project team members and government officials associated with the project may be biased, N2, who was not involved in the project, also recognised the achievement. N2 noted that some individuals in the KIFC project team who had previously worked with him in RIMBA MCA-I project might have contributed positive lessons learned from that earlier experience.

Another six respondents (C1, C3, G5, G2, G1, G4) mentioned that the outcomes are good but could still be improved. Four local community members expressed dissatisfaction (C8, C2, C6, C7), particularly with the revitalisation component, as they believed more budget should have been allocated for training before the restoration activities were conducted. Some also felt that their voices, especially those of the women, were not heard by their colleagues in the TKPPEG. Their statement was based on unfulfilled expectations in several aspects, summarised in Table 4.

Table 4. Several aspects that could be improved as viewed by some community members and government officials.

Expressed concerns	Descriptions	Quotes
Communication gap	Certain information, such as the locations of the canal blocks and the installation of the WLDL (Water Level Data Loggers), has not yet been conveyed from the project team to the relevant government institutions, specifically the Jambi Forestry Service and Environmental Service, which are set to receive the assets.	*"We still haven't received any updates about the WLDL. We're unsure whether they've been installed at the designated locations or not. We need this information to prepare the resources required for annual monitoring." - Participant G4*
Exclusion of women's voices	Members of the community working group (TKPPEG) who are women expressed a desire for a dedicated women's group in future activities.	*"Male members of TKPPEG often do not listen to the female members, so there is a need to form a group of women." - Participant C6*
Short timeframe	The project implementation period is too short.	*"...(we should) focus on the long-term benefits that the community can gain, so the project period should be at least 5 years. The benefits (for the communities) don't have to be in the form of wages but can also include*

		having permit/access to harvest of non-timber forest products (NTFP)." - *Participant C3*
Insufficient and delayed training	The series of training provided was insufficient and not delivered in a timely manner.	*"We received training but not from the beginning; we had to wait until after the tilapia fingerlings were purchased. Many of the fingerlings died due to the long journey from Jambi and we couldn't handle them immediately."* - *Participant C7*

4.3.2 Obstacles and limitations experienced by the participants

Participants shared the challenges they faced in the KIFC project, as well as in other similar projects, covering themes such as natural factors (including natural disasters), monitoring and evaluation, economic aspects, governance and politics, and cultures.

4.3.2.1 Challenges specific to the socioeconomic revitalisation activities

The challenges raised by local communities primarily focused on the implementation of socioeconomic revitalisation through the Independent Peat Care Village program. While the project team already handed over the assets to TKPPEG in each village in December 2022, all participants from this stakeholder group, except C9, acknowledged the difficulties in continuing the program due to severe flooding between December 2023 and April 2024. C9 did not comment on this issue, as he was not involved in the KIFC project. Participants from other stakeholder groups, P2 and G3, who work directly at the site level, also highlighted flooding as a significant challenge for the communities. C2 specifically mentioned the inactivity of the community working group due to its members being occupied with seeking income after months of dealing with the aftermath of the flood:

> "After the months-long flood, people are still focused on economic recovery by working at the palm oil factory, so the activities have not resumed yet." - Participant C2

Most of the tilapia fish in both villages escaped from their ponds during the flood, and the areca nut seedlings were dying. Even the mature areca nut trees in Village 1, planted over five years ago, couldn't survive the flood. During my fieldwork, I observed many of these trees had been cut down, and according to C1, C2, and C3, they are being replaced with oil palm which has a higher selling price. All participants from local communities believe that periodic floods (every two years) are common in areas along the Batanghari River. However, this time, the water level and duration of the flooding are severe, with C2 and C8 noting that the last time they experienced such conditions was in 2003.

Aside from flooding, the reasons for the discontinuation of activities are related to economic aspects, with key issues including 'lack of profit,' 'high operational costs,' and 'not economically viable'. C1 and C2 shared their experiences with raising Joper chickens, a breed they selected based on information from online videos suggesting it would be larger and more profitable than regular chickens. However, the high costs of electricity for lighting the chicken coop, expensive feed, and the long distance to sell the chickens from Village 1 to the main market in the city resulted in minimal profits. A similar problem was experienced by participants C6, C7, and C8 from Village 2 with their tilapia fish farming:

> "Since biofloc ponds require constant oxygen, the electricity costs are high. It's challenging to continue (tilapia farming), even though our own neighbours within the village are eager to buy the fish." - Participant C8

Details of activities and obstacles in each village are summarised in Table 5 below.

Table 5. Alternative livelihood activities supported by KIFC project and obstacles perceived by the communities.

	Village 1	Village 2
Small business activities	• 15 units of tilapia fishpond (netted cage pond) • 'Joper' chicken farming • BSF (*Hermetia illucens*) larvae farming for chicken feed	• 17 units of tilapia fishpond (tarpaulin pond with biofloc[4] system) • Areca nut seedlings production • Banana chips production
Administrator	Village 1 TKPPEG	Village 2 TKPPEG
Continuation	All the activities are currently inactive.	Six fishponds remain operational. Other activities are currently inactive.
Obstacles	Floods, no access to central electricity grid and road infrastructure, not profitable (chicken farming).	Floods, no road infrastructure, not profitable (tilapia farming with biofloc system).

4.3.2.2 Project monitoring and evaluation

Obstacles experienced by P1 include concerns about keeping the project on track, especially in 2021 when the COVID pandemic was still prominent. Additionally, there were challenges due to the different systems and approaches to work between Korea and Indonesia. In relation to project targets, G4 mentioned that monitoring and evaluation processes are typically carried out together with BRGM or the project donor, but the results have yet to be considered for adjusting future similar project, "*I have criticised that the monitoring and evaluation results have not reached higher authorities or are not being considered.*" Additionally, G4 believed the targets remain focused on quantitative outcomes, while qualitative aspects, such as shifts in community mindset, are often overlooked.

[4] Defined as 'the use of aggregates of bacteria, algae, or protozoa, held together in a matrix along with particulate organic matter for the purpose of improving water quality, waste treatment and disease prevention in intensive aquaculture systems", see El-Sayed (2020) https://doi.org/10.1016/B978-0-12-816509-6.00013-6

4.3.2.3 Funding arrangements

A1 noted that rehabilitation is both costly and challenging, due to the trial-and-error nature of the process and that “success is not guaranteed”. G4 expressed concerns about restoration programs being constrained by the annual budgeting cycle or the ‘fiscal year approach’, particularly for short-term projects. G5 raised worries about the reliance on temporary funding, which undermines long-term sustainability. G3, representing the Forestry Management Unit, highlighted issues limiting field operations, “*Our field allowances are often insufficient, and the budget provided by the Forestry Service is limited*.”

4.3.2.4 Politics and governance

G1 expressed the view that regional politics play a significant role in ecosystem restoration efforts, *" It is highly dependent on regional political regimes because protected forests fall under the jurisdiction of the Forestry Service and the Head of the Forestry Service is a position appointed by the Governor."*

P2 highlighted regional challenges, mainly involving village authorities. She noted, "*Aid often goes to those close to village leaders, many of whom have already received assistance, leading to unequal distribution.*" G3 added that villages receiving frequent aid have a different view of the project.

Keywords such as 'egocentric' and 'egosectoral' emerged during interviews with P2 and G4, illustrating how different governmental institutions in related sectors tend to prioritise their own interests and each institution operating in silos rather than aligning their efforts toward the shared goal of ecosystem restoration. For example, according to P2, the education center built by the project was handed over to the Forestry Service on behalf of the provincial government. However, G4 argues that the Environmental Service should also have access to it.

> “The handover of the Peatland Education Centre assets is still unclear to me. It’s a shame if the building goes unused, especially with all its facilities. The Forestry Service feels the facilities were entrusted to them by the Governor, but the Environmental Service also has activities related to peatlands, so it should be shared. But it’s still egosectoral.” – Participant G4

A2 raised concerns about stakeholder involvement and questioning, "w*ho will take responsibility after the project ends*?". G5 identified governance as a major challenge for sustaining restoration activities, noting that the Directorate of Peat Degradation Control lacks a regional technical implementation unit. G2 from the Forestry Service acknowledged the limited number of field staff and the minimal involvement of Forest Management Units[5](FMUs). G3 specifically criticised the situation, stating that their involvement was limited to being invited to certain events without broader engagement:

> “We were not consulted enough, (they) only involved as invitees in certain activities, including visits, project results inaugurations, and asset handovers.” - Participant G3.

4.3.2.5 Traditional or cultural values

C8 and C9 reflect the traditional values held by communities, where, as project beneficiaries, they tend to accept what is given without making significant demands. While they may offer suggestions or ideas, they do not view the lack of consideration for these inputs as problematic.

> "We want to express our opinions, but we feel hesitant in front of the officials." - Participant C8.

4.4 Goals and Expectations Following Project Conclusion

Below are the responses from participants when asked to express their goals, plans, and expectations after the project implementation period ends in late 2024.

4.4.1 Assets handover to the Indonesian government and local communities

G1, P1, P2, and G5 mentioned that, following the typical policies of grant-funded projects, all assets except the Peatland Education Centre and water level data logger (WLDL) have been handed over by KIFC on behalf of the Korea Forest Service to the Directorate of Peatland Degradation Control of MoEF. The assets related to revitalisation activities and canal blocks were directly transferred by MoEF to the community working groups in each village. The revegetation outcomes were handed over to the Forestry Service, although P+2 maintenance is still funded by KIFC. G5, representing MoEF, expect that the Forestry Service, as part of the local government, would contribute to sustaining the restoration efforts. He also expressed hope that communities involved in the revitalisation program would eventually become self-reliant in achieving their own welfare.

[5] The smallest unit of the forest management system at the local level in Indonesia.

4.4.2 Continued technical and funding support

All interviewees who are directly involved with KIFC project (n=16) expressed a desire for its extension, with hopes for continued technical and financial support. However, G5, A2, and N2 also have high expectations for the local government to take over field activities once project funding ceases, *"Once the project is completed, the local government should immediately take over."* - Participant A2.

Responses from C4 and C9 interviewees, who had no direct involvement in the KIFC project, reflected their experiences with other previous projects, stating that "*updates on the continuation of activities are important*". Meanwhile, G6, A1, and N3 did not provide any answers.

4.4.3 Research facilities and community service

A2 from the University of Jambi expressed his intention to utilise KIFC project's revegetation site as an educational forest. In recent years, the site has been used multiple times for field practicums and research for forestry students. Some lecturers also plan to conduct community service program in two villages that were involved in KIFC project. G2 and G4 from the provincial government plans to use the Peatland Education Center building for relevant future activities.

4.4.4 Undefined goals

When asked about their post-project plans, responses from community members lacked clarity, with answers such as "*we don't know yet*" or "*we'll see later*". However, C1, C2, C3, C6, C7, and C8, remain eager to be involved as field workers and expressed interest in continuing their participation if provided with additional support or training in the future. C3 said:

> "Village 1 is a buffer village. If the project is maintained, it will directly impact our village and residents. If the 200 hectares are cared for every year and the government or related agencies allocate funds for it, the workers will certainly come from our community. If the restoration is successful, our villagers will benefit economically from it." - Participant C3

4.5 Necessary actions and key factors to consider

In addition to expressing their goals and expectations for the post-project period, participants discussed actions needed and important factors to consider in order to achieve their goals or meet their expectations. Key terms that emerged were: 'training', 'women's group', 'political will', 'maintenance funds', 'exit strategy', 'commitment', 'partnership', 'maintenance', and 'transparency'. Several participants emphasised that these considerations are not only relevant to the KIFC project but should also be considered by similar projects.

4.5.1 Investing in human resources

G1, reflecting on his experience primarily in managing national parks across various regions in Indonesia, noted that changing stakeholders' mindsets and behaviours is more challenging than building infrastructure. Therefore, in development projects, the priority should be investing in human resources. N1 further emphasised that strengthening village institutions and developing community skills are the most important aspects, "*The focus of assistance should not be on providing physical assets but rather on strengthening institutions and community skills.*" In line with this, N2 argued that active community participation can also be encouraged by focusing on providing training opportunities for them.

The request for more intensive training came from C1 and C2, with both emphasising that the timing of the training will determine the final outcome. They underline that the training should take place at the beginning before the community work plans are developed.

4.5.2 Promote establishment of women's group

C6 and C7 proposed that, if the project continues, they hope a dedicated women's activity group can be formed. C5 and C6, both female interviewees, were generally hesitant in their responses throughout the interview but became more confident and enthusiastic when asked about the women's group training programs they had participated in previously. C5 shared her experience as a participant in the RIMBA MCA-I project's training for women and subtly expressed her interest in continuing that business:

> "(We made) banana chips, the equipment was provided by WWF and is still stored at one of the group member's homes, it was quite successful at that time. If we want to revive the business, we need knowledge or assistance with marketing." - Participant C5

C6 also shared a similar story about a similar training for women, organised by a national environmental conservation NGO.

4.5.3 Political will and landscape management

N3 highlighted the importance of political will from stakeholders, particularly policymakers, *"Will the government be willing to review the concession permits, especially those issued before Londerang was designated as a protected forest?"* There are many concessions surrounding Londerang, and peatland management is still approached through administrative boundaries, despite the existence of the Peatland Hydrological Unit concept (see Section 2.1.2).

N2 pointed out that the management of Londerang has been ineffective, stating, "*Londerang is divided between two FMUs. This is ineffective because the landscape approach has not been adopted, and management remains confined to administrative boundaries*."

Attention from prominent figures is considered important by local communities, although it does not necessarily reflect their political will. Communities feel motivated to participate in restoration efforts when officials, such as head of local governments or delegations from the Korean government, visit their villages.

4.5.4 Sustainable financing

The identification of funding sources for asset maintenance and restoration activities was a recurring topic during interviews with government officials, academics, and NGOs. G1 suggested that the local government allocate operational funds for asset maintenance and continue community support through the Specific Allocation Fund (DAK) as part of the state budget. G2, representing the local government, acknowledged a lack of awareness about the possibility of using DAK for maintenance funding but expressed a willingness to explore and consider this option.

Based on my observations during the Provincial RPPEG meeting (see Section 3.3.2), the expert team drafting the document is currently working to identify funding sources for asset maintenance, though not specifically for grant-funded projects. A1 as a member of the team said:

> "For example, if a restoration project ends after two years, what happens after that? Who will continue it? If it's handed over to the government, of course, they will accept it, but this comes with the responsibility of managing it and allocating the necessary budget. In RPPEG, we try to link the budget for restoration, but there's no specific code* for peatlands, only for wetlands." - Participant A1

*Code based on the Minister of Home Affairs Regulation Number 90 of 2019 on the Classification, Codification, and Nomenclature of Regional Development and Financial Planning.

4.5.5 Transition plan or exit strategy

A1, G1, and N2 emphasised the need for a clear exit strategy to facilitate the transition of project responsibilities from the implementation team to the next accountable stakeholders. P1 also stressed that a well-designed exit strategy aligned with the Indonesian government's plans is essential at this stage, "We cannot build an exit strategy on our own. Even if we do, without cooperation from our partners, it cannot be realised."

4.5.6 Enhanced commitment and collaboration

C3 pointed out the importance of commitment from government institutions to support the community. N1 shared the experience of KKI WARSI's involvement in a multistakeholder forum for the area surrounding HLG Londerang which includes various stakeholders from the Tanjung Jabung Timur District and is supported by the local Regent. Additionally, collaboration with other parties was considered an important action, as evidenced by G2's positive experience of working with agencies like the military, police, and private companies for fire suppression:

> “...the installation of CCTV in the regional police headquarter to gather fire hotspot data from companies who work around peatland ecosystems, has proven effective. In 2023, the impact was significant with minimal fires—only 2,000 hectares, all on mineral soil.” - Participant G2

A2, in his plan to establish an educational forest at the KIFC’s revegetation site, acknowledged the need to collaborate with the Forestry Service, since protected areas fall under their supervision.

N2 suggested that collaboration with research institutions is also important for project development. C4 shared his experience with the RIMBA MCA-I program, where there was collaboration with a private telecommunications company to send updates via GSM networks on hotspots detected by the early warning system.

4.5.7 Continued monitoring and maintenance

Regular monitoring and maintenance of physical project assets were deemed important by all stakeholders. This maintenance covers all project components, including canal blocks, WLDL, planted trees at the revegetation site, the Peatland Education Centre building, and assets from revitalisation activities managed by TKPPEG.

4.5.8 Regular publication, reporting, and publicly accessible database for transparency

P1 shared how the Londerang peatland restoration project helped raise public awareness in Korea about peatlands, as it was frequently featured in Korean news articles. Drawing from this experience, he emphasised that continued media coverage and publications are essential for sustaining restoration efforts.

> “When I first started this project, people didn’t know much about peatlands. Now, in Korea, many people, especially students, are aware. Professors even use it as a case study in their classes. I believe most undergraduate forestry students are now familiar with peatlands, and when they think of peatlands, they immediately associate them with Indonesia." - Participant P1

N3 further highlighted the importance of data transparency, particularly regarding the progress and success parameters used in restoration projects. Additionally, making reports available to the public was seen as a key step to build trust and, hopefully, gain more support for peatland restoration efforts.

4.6 Summary

All participants recognised the importance of peatlands and acknowledged that these ecosystems are under significant pressure, mainly due to human activities. Their experience with recurring peatland fires has led them to view the government's intentions for restoring degraded peatlands positively, although the term "restoration" is understood in different ways by different participants.

Most participants directly involved in the restoration efforts carried out by KIFC reported positive outcomes and would like to see the project extended, although some also acknowledged that improvements could still be made to achieve better results. Nearly half of the local community members, however, expressed dissatisfaction with the revitalisation process, citing inadequate training and a sense that their voices, especially those of the women, were not heard by the community working group.

Post-project goals and expectations varied, though not all participants had a clear goal or plan. The project donor expected that all assets handed over to the Indonesian government would be properly maintained. The central government expected local governments to play a key role in continuing restoration efforts. They also anticipated that communities benefiting from the socio-economic revitalisation program would eventually become self-reliant. Local communities expressed a desire for continued technical and financial support from the project team, as they faced challenges like flooding and felt the training provided was insufficient, leaving them unprepared to manage their businesses independently.

Participants identified several key actions they believe are crucial for sustaining the outcomes of the restoration project. These included investing in human resources, establishing dedicated women's groups, using a landscape approach for peatland management, securing political will, developing a clear exit strategy, enhancing collaboration and commitment, and ensuring regular monitoring and maintenance, with reports or publications being made accessible to the public.

Chapter 5

Discussion

Local communities cleaned and dry their freshly caught tilapia along the Batanghari River to make salted fish. Artisanal salted fish production is one of the key sources of income for villages surrounding the Londerang peatland ecosystem.

Chapter 5: Discussion

This chapter will discuss the findings from literature review and the data collected during fieldwork to address the research questions proposed in Chapter 1:

1. What is the experience in Indonesia of peatland restoration projects after the project ends?
2. How do key stakeholders interact with peatlands in Londerang, perceive their value, and recognise the risks associated with degraded peatlands?
3. What goals do Londerang peatland restoration project stakeholders have after the project ends?
4. What actions do Londerang peatland restoration project stakeholders consider as necessary to achieve these goals?

5.1 Post-project experiences of peatland restoration in Indonesia

This section will address the first research question. In the literature review, I discussed the lessons learned from several restoration projects (Table 2), both those that have completed their implementation phase and those that are still ongoing. However, as this research focuses on the post-project period, I will focus on the CKPP, KFCP, and RIMBA MCA-I projects, which have already completed their implementation phases.

The reports from these three projects did not specifically address follow-up actions post-project. Instead, the factors considered crucial for sustaining restoration outcomes were presented as recommendations rather than concrete action plans. Nevertheless, the literature review of the experiences of CKPP, KFCP, and RIMBA MCA-I project completions (Section 2.3.2) highlights several important lessons, which are summarised in the following subsections.

5.1.1 Financing mechanisms and clear institutional arrangements

A key factor for sustaining restoration outcomes is the establishment of sustainable funding models to support ongoing asset maintenance and community livelihoods post-project. Studies shows that peat restorations are costly (see Section 2.3.1), even for monitoring and maintenance (refer to evaluation report of RIMBA MCA-I in Section .3.2). The completion report of CKPP highlighted the need for a long-term funding mechanism to ensure financial security for local stakeholders and enable them to transform their livelihoods through improved land-use practices.

Clear institutional responsibility as a demonstration of commitment is also essential. The experiences of CKPP and RIMBA MCA-I highlight significant shortcomings in this regard. Both projects lacked clarity regarding who would commit to take the responsibility for the project's assets and maintenance after completion, ultimately undermining the sustainability of the projects.

The RIMBA MCA-I project managed to meet its restoration targets and provide economic benefits to local communities, but similarly to other projects, it lacked a concrete post-project maintenance plan.

The assumption that local communities would voluntarily take on the responsibility of maintaining the canal blocks and revegetated areas without structured support was overly optimistic. The report estimated significant costs for maintaining the project infrastructure over two decades, yet no government institution was explicitly assigned responsibility for this task. This issue is further exemplified by the testimony of participant N2, regarding the catastrophic fire incident in 2019 that destroyed all the infrastructures of RIMBA MCA-I project in Londerang. At that time, there was no longer a field team responsible for maintenance and safeguarding assets such as the early warning system for hotspot detection, planted trees from revegetation activity, and the canal blocks constructed by the project.

5.1.2 Adaptive long-term planning

The abrupt end of KFCP, without sufficient time to transition the knowledge gained into practical contingency plan, illustrates the importance of adaptive long-term planning to adjust project workflows when unexpected challenges arise. The post-project suggestions from CKPP also included the formation of a Master Plan as a living document (CKPP Consortium, 2008 in Section 2.3.2), highlighting the need for an adaptive plan to sustain restoration outcomes. In addition to serving as a reference for coordination among donors to synergise restoration efforts and avoid duplication or overlap, as argued by the CKPP consortium, the adaptive nature of this plan means it would follow an iterative process, continuously adjusting approaches based on lessons learned from each project implemented and hopefully minimising unintended risks. However, such an adaptive process is clearly not possible without adequate resourcing.

5.1.3 Local and political support

While community involvement is often highlighted as a success factor, it must be accompanied by structured and ongoing support mechanisms. An example can be drawn from the local communities involved in the RIMBA MCA-I project, who expressed that if there are future peatland restoration activities in their areas, they hope to be involved again (Section 2.3.1). This statement indicates their support for restoration activities and suggests that it is feasible to implement post-project monitoring and maintenance on an ongoing basis. However, projects that rely solely on community goodwill for maintenance without adequate resources or guidance, as observed in the RIMBA MCA-I project, risk not being sustained.

Reflecting on the experience of KFCP, which had to be halted before the planned implementation period ended, political support is an important factor that must be present to ensure the sustainability of restoration projects. Political backing at both the local and central government levels provides the necessary authority and legitimacy for restoration initiatives. The perception from the district government that they were insufficiently involved in the decision-making process, along with internal issues within the donor country's government (the Australian federal government, see Table 2 in Section 2.3.1), were two challenges reported by Atmadja et al. (2014) that clearly did not meet this requirement.

5.2 Stakeholder interactions with Londerang peatlands: perceptions of value and awareness of degradation risks

This section will address the findings related to the second research question. I will explore how all stakeholders are aware of peatlands through various types of engagement: livelihood, research, and restoration/conservation efforts. Some literature suggests that awareness is an important component in influencing human behaviour in interactions with nature, creating an ‘enabling condition’ that encourages communities to develop pro-environmental behaviours (Kittinger et al., 2016; Si et al., 2022). In the context of this research, this awareness facilitates more active engagement in conservation and restoration efforts.

Participants from project donors and government institutions engage with peatlands through conservation and restoration projects, with some more involved in field activities, while others mainly work in their offices in Jakarta or at the provincial level. Academics engage through teaching, research, and community service activities; they generate and hold scientific evidence and could provide input for policy-making processes based on their experiences in both community service and research outcomes. NGOs have a role in shaping the narrative of peatlands to the public, including local communities, as they operate at the grassroots level. NGOs also act as intermediaries between donors—who often have varying goals and agendas—and the communities directly affected by peatland restoration projects. Their influence can be significant because they are responsible for interpreting and translating the objectives of their donors into actionable plans, as seen from the role of WWF in the RIMBA MCA-I project and the experience of KKI Warsi. This aligns with the findings of Elias et al. (2021), who emphasise that trusted organisational brokers like local NGOs are instrumental in supporting communities to develop organisational capacity, technical planning, and leadership in monitoring processes. Therefore, although the government holds the highest authority, for example to decide management actions or issue permits, other stakeholders significantly influence restoration processes, underscoring the importance of multistakeholder engagement and governance processes.

Local communities in the two villages I visited interact with peatlands through their livelihoods (see Section 4.1.1). The Indigenous Malay people in Village 2 have lived for generations as fishermen, primarily engaging with the Batanghari River and other waterways surrounding their village rather than the peatlands themselves. This contrasts with the transmigrant communities in Village 1, who moved to Jambi essentially to practice crop farming directly on the peatlands. This situation relates to studies by Gunawan et al. (2021) and Osaki et al. (2015), discussed in Section 2.1.2, which explore transmigration and agricultural development for Indonesia’s food security objectives. People in Village 2 only began farming when they started working as labourers for an oil palm plantation since the early 2000s.

Keniger et al. (2013) discuss the typology of nature-human interaction, comprising three types: indirect, incidental, and intentional interaction. The form of interaction between local communities in Village 1 and Village 2 is intentional, meaning they experience or engage with nature through direct intention, in this case, viewing nature primarily as a source of livelihood. Although both types of interaction are intentional, the transmigrant communities of Village 1 engage more directly with the peatlands compared to the Malay communities in Village 2.

The differing levels of interaction with peatlands between the two communities highlight the importance of tailoring restoration initiatives to local context, especially cultural background. The transmigrant farmers in Village 1, who rely directly on peatland agriculture, may have a more immediate stake in the health and sustainability of the peatland ecosystem. In contrast, the Malay fishermen of Village 2 may prioritise the health of aquatic ecosystems but are still indirectly affected by peatland degradation, such as through changes in water quality and increased flooding (see Sections 4.1.1 and 4.3.2). This highlights the need for training programs that first enhance scientific understanding of peatland ecosystems before introducing livelihood-related activities, ensuring that restoration efforts are relevant and effective for each community's specific interactions with the environment.

The transition in Village 2 towards employment in oil palm plantations since the early 2000s aligns with observations in some literature in Section 2.1.3 (Miettinen et al., 2012; Varkkey, 2013; Wijedasa et al., 2018), adding new complexities to the interactions of villagers and peatlands. Although the villagers have negative sentiments toward plantations due to observed negative impacts (i.e, declining fish catches due to the construction of embankments and oil palm waste disposal;, Section 4.1.1), they still depend on income as oil palm labourers because the earnings are more certain compared to fishing. Engaging this community in restoration may require offering alternative livelihood opportunities with immediate benefits to address economic dependencies on plantation work.

Ecosystem services provided by peatlands in the form of carbon sinks and sequestration are seen as opportunities by some participants from the government and NGOs, especially with the presence of the BioCarbon Fund project in Jambi, which promises to bring benefits to the provincial government using the REDD+ result-based payment scheme to help Indonesia reduce its GHG emission. However, members of local communities who interact most intensively with the ecosystem are confused about how carbon could generate income, as it is an invisible commodity (refer to C1's quote in Chapter 4.1.2). This illustrates how the international mechanisms for climate change mitigation, like REDD+, which are included in national and global agendas, are often not adequately communicated to local communities.

Causes of degradation identified from the interviews were aligned with the comprehensive review of drivers of peatland degradation in Southeast Asia by Dohong et al. (2017). For local communities, there is not always a clear understanding of the connection between the health of the peatland ecosystem and the importance of conserving the landscape in relation to their livelihoods (e.g., fishing, crop farming). However, they hold fragments of information that illustrate the decline in peatland ecosystem functions, such as the decline in biodiversity (see quotes about declining fish catches in Chapter 4.1.1

and siamang gibbons in 4.1.4) and also the decline in water absorption and storage capacity, which exacerbates the likelihood of flooding during the rainy season (Section 4.3.2).

Various interpretations of "restoration" among stakeholders (Section 4.2) indicate a need for better communication strategies. Ensuring that all parties have a shared understanding of project goals and processes is vital for aligning efforts and expectations.

5.3 Exploring stakeholders' goals and recommended actions for sustaining Londerang peatland restoration post-project

This section will discuss findings related to the third and fourth research questions, and eventually the overarching research question – *How do key stakeholders perceive the value of peatlands, their goals after the completion of restoration projects, and what actions do they believe are necessary to achieve them?*".

Post-project goals and expectations varied, but all interviewees directly involved in KIFC project (n=16) expressed a desire for the project to be extended based on the perceived outcomes, which were generally viewed as good, but also able to be improved. The risk of fire is the primary motivation for local communities to view restoration efforts positively, a phenomenon similar to that observed by Lestari et al. (2021) in a local community in South Sumatra.

Interviewees from government institutions and the project donor are finalising the transfer of KIFC project assets from the Korean to the Indonesian partners by the end of 2024. However, this alone cannot address the actual 'post-project' component—the primary concern of this research—since the continuation of restoration efforts and maintenance will depend on the provincial government's priorities. Despite the Provincial Government of Jambi receiving awards from the BRGM as the national reference for peatland restoration implementation and for developing educational materials on peatlands for high school students (ANTARA News, 2024; BRGM, 2023), which can be seen as evidence of commitment, reports from the Central Bank of Indonesia (2024) indicate that the Province's main income still comes from agricultural commodities like oil palm and rubber. This economic reliance suggests that peatland restoration may not be a priority for the provincial government, and threats from industrial agriculture are likely to persist.

Local stakeholders' desire for continued technological and funding support indicates a lack of preparedness and inability to operate independently. These issues are attributable to the short implementation period, and the fact that training was provided only at the beginning rather than throughout the process—an issue consistent with observations in the literature (Table 2). Moreover, prolonged floods negatively impact the communities, further hindering their ability to operate independently. Half of the interviewed local community members (n=4) were dissatisfied with the socioeconomic revitalisation activities due to some obstacles discussed in Section 4.3.2, but they shared ideas for improvements if given more opportunities in the future (Section 4.5). This may explain why they still wish to continue livelihood activities despite previous failures in chicken farming, fish cultivation, and other areas.

The plan by the University of Jambi to establish an educational forest for research and teaching, as well as to conduct community service in some of the villages involved in the KIFC project, can be viewed as a tangible outcome of this project if it can be realised. Such an initiative could also contribute to continuous learning, enabling an adaptive planning approach for future restoration projects, as recommended based on lessons learned from CKPP (discussed in Section 5.1.2). Endorsement from the provincial government is imperative in this regard because HLG Londerang as a protected forest area falls under the authority of the Forestry Service (see Figure 2 in Section 2.2). This initiative could also be considered for inclusion in the draft Provincial RPPEG currently being developed, with the hope that efforts to realise it can be more assured.

5.3.1 Stakeholder's recommendations for lasting project impact

Participants identified key actions they believe are crucial for sustaining project outcomes, as outlined in Section 4.5. Suggestions from the interviewees primarily focus on the improvement of governance components and funding for the revitalisation activities. These could provide practical guidance for addressing the gaps identified in the current restoration process and improving future similar efforts.

The Independent Peat Care Village program as part of the 3R approach aims to facilitate active participation among local communities, encapsulated in the tagline "community-based peatland restoration program" (BRGM, 2020). This initiative employs a bottom-up approach to enhance the communities' sense of ownership. However, dissatisfaction among community members, particularly women, regarding the revitalisation activities highlights the need for more inclusive participation. Projects should implement mechanisms that engage all community segments, focusing on adequate training. Additionally, gender considerations must be integrated to ensure marginalised voices are heard in decision-making processes (e.g., establishment of gender-sensitive action plans or women's groups).

The varying degrees of engagement with peatlands and different cultural background among the two case study communities highlight the necessity of customising restoration initiatives to fit the local context beyond administrative boundaries (Section 5.2). The KIFC project attempted to achieve this through facilitators who guided TKPPEG in selecting livelihood activities based on the characteristics and potential of each village. However, the effort did not reach its maximum potential, as the process was somewhat rushed, leaving the communities with limited time to fully grasp the aim of revitalisation concept within the 3R framework.

Issues raised by an interviewee regarding monitoring and evaluation (Section 4.3.2.2) highlight the necessity of enhancing communication between field teams and higher authorities to effectively share findings and support adaptive planning for future projects. Improved communication can also prevent aid distribution from being concentrated in specific areas or repeatedly involving the same groups of local communities. Furthermore, implementing regular monitoring and maintenance, along with publicly accessible reporting, can enhance transparency and accountability by enabling stakeholders to effectively track progress.

5.3.2 Layers of complexity

Baker et al., (2015) state that restoration is “embedded in murky and complex interest politics”. It is also acknowledged by BRGM (2020) that the management of Indonesia's peatlands involves the authority of numerous sectoral agencies or institutions, including environmental, forestry, agriculture, public works, and local governments. In this context, Metcalf et al. (2015) argue that restoration projects focused on smaller spatial scales tend to inspire more effective collaboration. The KIFC project, which concentrated on a relatively small area compared to the entire Londerang landscape, fits this criterion. The complexity of political and institutional issues was evident in this case study.

Firstly, participants cited regional politics and ego-sectoral concerns across several government institutions as challenges. Ensuring that peatland becomes a priority for elected governments in every five-year election cycle is crucial, as Harrison et al. (2020) noted that sustained political and financial support over the next few decades, or even generations, is crucial to ensure that degraded peatlands can be fully restored to their 'natural' condition. Secondly, the community's dependence on income from working as labourers in private-owned oil palm plantations (see Section 5.2) means that despite being vocal about the negative impacts of plantation operations on watershed health, including peatlands, the community in Village 2 relies heavily on these jobs.

Some participants did not have a clear goal or plan for restoration (refer to Section 4.4.4). While they expressed a desire for ongoing support from the project, especially for revitalisation efforts, this does not directly address the question, "What do you expect to see or plan to do after the project ends?" Their expressed desire for continued support, particularly in the form of employment as field workers, indicates a dependency on the project for income rather than a transition towards self-sustaining livelihoods. This pattern was also evident in the RIMBA MCA-I project seven years prior, suggesting a recurring issue within the same landscape. This illustrates that the benefits accrued from their involvement in restoration projects are mainly perceived as no different from working for wages, rather than generating income from the alternative livelihoods introduced and supported by the project's socio-economic revitalisation activities. Additionally, this indicates that the revitalisation component is being seen as detached from the rewetting and revegetation agenda, which together form the 3R concept mainstreamed in national peatland restoration efforts in Indonesia.

According to Langston et al. (2024), offering livelihood options that do not surpass the opportunity cost of existing land-based livelihoods (such as oil palm and rubber) “risk making local people more vulnerable and violating their rights to self-determination." Therefore, unless alternative livelihoods offered through restoration projects provide economic benefits that are at least comparable to those from existing land-based livelihoods, local communities may remain dependent on project employment rather than embracing new, sustainable income sources. The absence of incentive schemes for community members who assumed responsibility for maintaining infrastructure~~s~~ like canal blocks further exacerbates the issue of dependency on project-based employment. Without tangible incentives or support, community members may lack the motivation to invest time and resources into maintenance activities.

5.3.3 Broader implications

The Indonesian government has significant responsibilities to address degraded peatlands, and much remains to be done to tackle the issue. Given the limited scope of this research, it can only provide modest suggestions as building blocks towards improved project design, including exit strategies or transition plans that are place-specific, ensuring that project-based restoration efforts have lasting impacts even after the implementation period ends. One of the main steps is revisiting the 3R approach by conducting an evaluation to determine whether this principle is well understood by all involved actors. This provides the basis for building trust among actors to earn their commitment. Building trust involves acknowledging vulnerability and understanding that different groups and communities experience varying levels of vulnerability based on the risks and benefits accrued of the project, which is essential for addressing those vulnerabilities (Metcalf et al., 2015).

The central government, together with the provincial government, must address the interplay between peatland utilisation for economic development and the preservation of the ecosystem itself. The concept of peatland hydrological unit (PHU), as an embodiment of the landscape approach, should be the main lens in designing restoration initiatives to encourage the integration of ecological, social, and economic dimensions, as suggested by some literature (Sayer et al., 2014; van Oosten et al., 2021). This can be achieved by reviewing permits for industrial activities located on peatlands, especially those with permits lasting decades, and by regularly enforcing laws on waste disposal into waterways, thereby requiring commitment from the private sector. Strengthening the capacity of the Forest Management Unit (FMU) as a local 'policy intermediary' is also worth considering (Kim et al., 2016). FMUs were established as a solution for the 'weak state of forest area management in the field' and are expected to have the most in-depth knowledge of forest areas on site (Katrodihardjo et al., 2011). FMUs are burdened with high expectations, but Kim et al. (2016) argue that many of them exist only on paper without the necessary staff or operating budgets to function effectively—a situation also observed in this study (refer to the quote from Participant G3 in Section 4.3.2.3).

While this study sheds light on the importance of understanding stakeholder perceptions and actions in sustaining peatland restoration efforts in Jambi, it does not fully capture the intricate dynamics of the social and ecological components involved. Future research should also consider employing a Social-Ecological Systems (SES) framework illustrated by Figure 5 (see Ostrom, 2009; Ostrom & Cox, 2010) to explore these complexities more thoroughly by identifying variables relevant to the four subsystems of SES: resource system, resource units, governance system, and users.

Incorporating an SES framework would allow for a more holistic analysis of the dynamic relationships and feedback loops between human societies and ecological systems. For example, Cox (2014) applied this framework to study interconnected, community-managed small-scale irrigation systems in the high desert of northern New Mexico, which have existed for centuries but now face challenges from economic development, demographic shifts, conflicting state-level water policies, and the influence of water markets. Cox's analysis demonstrates how concepts such as social networks and multilevel governance can explain the alignment between social systems and the biophysical systems they depend on.

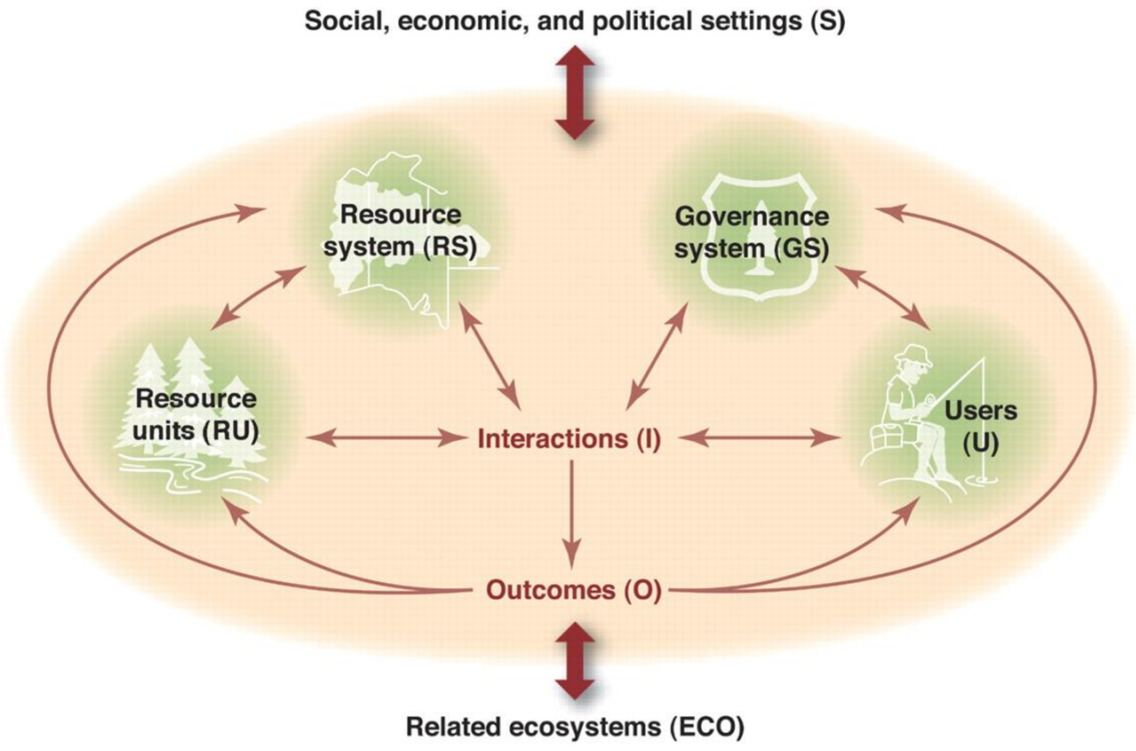

Figure 5. The core subsystems in the SES framework (reproduced from Figure 1 in Ostrom, 2009).

Governance, as one of the subsystems under the umbrella of SES framework, emerged as the key theme when research participants reflected on their experiences with the case study (and other similar projects) and offered suggestions for improving future restoration programs. To specifically address these issues, the Collaborative Environmental Governance (CEG) framework, introduced by Bodin (2017), can be seen as a valuable platform for designing restoration projects that address the complexities of peatland governance. Key elements of CEG are stakeholder networks, social capital, power dynamics, and shared learning and adaptation. Several experiences from the KIFC project align with these CEG components and highlight areas for enhancing peatland restoration efforts, as summarised in Table 6 below.

Table 6. Recommendations for improving restoration project design using the CEG framework.

Key elements of CEG	Experiences of peatland restoration in Jambi	Recommendations for future program
Stakeholder networks	Multi-level governance was observed, with central, provincial, and local stakeholders involved. Example: CCTV installation to monitor hotspots (coordination between governments and private companies) and multistakeholder platforms in Tanjung Jabung Timur district.	Map the collaborative network to identify each actor's network position and leadership quality, enabling more effective collaboration (Bodin, 2017).
Social capital	• Expectation of the local communities to be involved again if the project is extended (observed in both RIMBA MCA-I and KIFC project) • TKPPEG already established in each intervention villages	• Involving the local communities beyond the tagline of community-based restoration, based on the evaluation of how the 'bottom-up' approach was implemented. Policymakers could consider people-centred restoration strategies suggested by Elias et al. (2021) • Providing several trainings before and throughout the implementation process, including familiarising them to the PHU targeted for restoration, using visual props (e.g., maps and 3D model of the ecosystem)
Power dynamics	• Lack of coordination between the Forestry Service and FMUs resulted in FMUs being only	Managing these dynamics and addressing inequalities involves employing a variety of forums for engagement and communication,

Key elements of CEG	Experiences of peatland restoration in Jambi	Recommendations for future program
	involved in the beginning of the project • Egocentric issues between Environmental and Forestry Services over the use of the Peatland Education Centre post-project • Exclusion of women's voices in TKPPEG • Water monopoly by industrial plantations	from individual interactions to large-scale public meetings (Metcalf et al., 2015).
Shared learning and adaptation	Accumulated knowledge from several actors that were involved in multiple restoration projects (including within the same PHU), ensures that ongoing or future projects are better equipped to handle complexities and avoid past mistakes.	• Developing a realistic exit strategy with clear actionable items (depends on the available resources, including time, financial support, and technical assistance). Additionally, it should incorporate a financing scheme to incentivise field personnel responsible for maintaining project assets, (e.g., canal blocks and WLDL) to ensure long-term commitment. • Investing in research activities through the establishment of educational forest proposed by University of Jambi and utilising the Peatland Education Centre for training or similar activities. This will support adaptive approach to address challenges and unintended risks.

5.4 Limitations

There are a number of limitations to this study. One is a potential bias in the data, as all interviewees expressed positive views toward peatland restoration; this may be due to limitations in the respondents surveyed. Due to the extended process required to obtain permits for interviewing representatives from the private sector, I was unable to include any participants from this stakeholder group so certain perspectives may remain unexplored. Additionally, my research was conducted within a limited timeframe and coincided with Islamic celebrations within the local community, resulting in a relatively small sample size (n=22). There were also logistical constraints related to local transportation between villages and the city, as each trip required four hours of land and water travel.

The presence of uninvited community members during the interviews could be interpreted as their enthusiasm to provide feedback on the restoration project based on their experiences and understanding of both ongoing and past projects, which added honest insights. However, this may also have influenced the responses of the primary interviewees and the dynamics of the conversation. For example, in the interview with C4, his spouse dominated much of the dialogue. In contrast, the presence of close relatives during the interview with C5 made her more comfortable participating. Initially, although she was willing to be interviewed, she was hesitant and unsure if she could answer the questions. However, she eventually shared a wealth of information.

Chapter 6

Conclusion

A member of TKPPEG harvests banana fruits from the community garden, one of the products of socio-economic revitalisation activities (credit: KIFC)

Chapter 6: Conclusion

Peatland conservation and restoration are essential in the global fight against the climate crisis, yet vast areas of these ecosystems continue to be degraded. Indonesia, hosting one of the largest areas of tropical peatlands, has initiated numerous, mostly project-based, restoration efforts over the past decade. However, little is known about how to sustain the outcomes of these restoration activities post-project. Publicly available reports of these projects primarily offer recommendations for minimising challenges and outline the next steps following project implementation but lack comprehensive information on Indonesia's peatland restoration efforts after projects conclude.

Understanding the diverse interests and perspectives of stakeholders involved in peatland ecosystems is a crucial first step toward ensuring that restoration projects have a lasting impact beyond their implementation period. Each stakeholder seeks to fulfill their own agenda, which underscores the importance of examining their views on peatland restoration. This thesis aimed to explore stakeholders' perceptions of the value of peatland ecosystems, the risks faced by degraded peatlands, their goals following the completion of restoration projects, and the actions they believe are necessary to achieve these goals. The *Restoration of Burnt Peatland* project in Jambi Province served as a case study to address these research objectives.

The findings revealed that all interviewees directly involved in the case study project desired the continuation of restoration efforts because most felt that the project outcomes had met their expectations. However, there were also unfulfilled expectations, which further motivated them to advocate for ongoing restoration supported by project resources. The project donor anticipated that the Indonesian government would take proper care of all the assets transferred to them. The central government anticipated that local authorities would lead in sustaining restoration activities beyond the project implementation period and believed that communities benefiting from the socio-economic revitalisation programme would eventually become self-sufficient and participate in maintaining assets (e.g., canal blocks). This indicates that each stakeholder hoped others would continue or maintain the restoration results for them; ultimately, the burden of responsibility was placed on communities that often lack sufficient resources after the project ends.

The 3R approach—rewetting, revegetation, and revitalisation—often used in restoration projects alongside the tagline "community-based peatland restoration" — was not fully understood by local communities. This was due to inadequate communication of the Peat Hydrological Unit (PHU) concept underlying the 3R approach. As a result, it is unreasonable to expect full commitment from these communities to maintain project assets that require substantial funding, especially when they lack sufficient understanding of why they should do so.

Policymakers should focus not only on the quantitative targets of areas to be restored but also on qualitative factors, including stakeholder engagement and the execution of socio-economic revitalisation programmes. Ensuring that stakeholders have sufficient understanding of the restoration objectives is more challenging than constructing physical infrastructure. Upcoming restoration projects might face the same fate—assets becoming neglected or unmaintained shortly after completion—if authorities and policymakers do not make adjustments based on lessons learned from past projects, risking wasted resources of time, money, and effort. Rather than focusing solely on grand "show windows" by giving awards or publishing achievements that emphasise quantity (e.g., number of canal blocks built, survival rates of planted seedlings, number of Independent Peat Care Villages established), the government should convene all stakeholders to develop a long-term plan applicable to both donor countries and aid recipients.

Findings from this research, while specific to a geographic area, could inform other projects in Indonesia and other countries dealing with peatland restoration involving diverse stakeholder groups. More broadly, this study adds to the evidence of the complexity of ecosystem restoration and reflects on the progress linked to the United Nations Decade on Ecosystem Restoration 2021–2030. Addressing the challenges identified requires adaptive management strategies that consider both ecological and socio-political dynamics to ensure the sustainability and effectiveness of peatland restoration efforts, locally and globally.

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Appendix 1: List of guiding questions

(translated into Bahasa Indonesia)

For local community members

A. Stakeholders' understanding and awareness of peatland ecosystem, degraded peatland, and its restoration

1. Have you heard about peatland? What do you know about peatland?
2. Do you think peatlands are important?

B. Stakeholders' awareness of the Londerang peatland restoration project

3. Do you know about any restoration projects in Londerang? If yes, which activity are you most familiar with?
4. Were you involved in the Korea-funded project?
5. Based on your familiarity with the project, how do you think the project went?
6. What do you think about the current project outcomes? What areas do you believe the project should focus on more?

C. Goals after the restoration project ends

7. What are your expectations after the project ends? What would you like to see happen?

D. Important factors to be considered in achieving the goals

8. What factors do you think are important to help achieve those expectations?

For project donors

A. Stakeholders' understanding and awareness of peatland ecosystem, degraded peatland, and its restoration

1. What were the main drivers for the Korean Government to fund the peatland restoration project in Indonesia? And why was Jambi selected for this project?
2. Do you think peatlands are important? Does this project highlight the role of the peatland ecosystem in the Londerang Peat Protected Forest (HLG Londerang)?
3. What are the identified risks in HLG Londerang that were taken into account when designing the project?
4. What is the definition of peatland restoration?
5. What are the goals or desired outcomes of restoring peatland in HLG Londerang?
6. How do you ensure that the project is on track?
7. Aside from providing funding support, what roles does your organisation play in this project?

B. Project outcomes

8. What do you think about the current project outcomes?
9. Have you encountered any challenges on the ground?
10. Are there any identified opportunities to scale up or sustain the project outcomes?

C. Goals after the restoration project ends

11. What are the goals (plan) of your organisation after the project implementation period has ended?
12. Are there any GoK policies concerning the conclusion of restoration projects?

D. Important factors to be considered in achieving the goals

13. What are the factors considered crucial in fulfilling those goals?

For government and academics

A. Stakeholders' understanding and awareness of peatland ecosystem, degraded peatland, and its restoration

1. What do you know about HLG Londerang?
2. Do you think HLG Londerang is important?
3. What do you think are the existing threats to HLG Londerang?
4. Could you provide an overview of historical disasters that have occured in HLG Londerang in the past 10 years?
5. What is the definition of peatland restoration?
6. What are the goals or desired outcomes of restoring peatland?
7. How do you usually monitor restoration progress?

B. Stakeholders' awareness of the Londerang peatland restoration project

8. Which specific project component or activity within the Korea-funded restoration project in HLG Londerang are you most familiar with? Please explain in detail.
9. What is your role in HLG Londerang peatland restoration efforts? Please elaborate.
10. Have you encountered any challenges on the ground? Please explain in detail.
11. What do you think about the current project outcomes?

C. Goals after the restoration project ends

12. What are the goals (plan) of your organisation after the project implementation period has ended?
13. Are there any GoI policies concerning the conclusion of restoration projects?

D. Important factors to be considered in achieving the goals

14. What are the factors considered crucial in fulfilling those goals?

For non-governmental organisations

A. Stakeholders' understanding and awareness of peatland ecosystem, degraded peatland, and its restoration

1. What do you know about HLG Londerang?
2. Do you think HLG Londerang is important?
3. What do you think are the existing threats to the peatland ecosystem in HLG Londerang?
4. Could you provide an overview of historical disasters that have occured in HLG Londerang in the past 10 years?
5. What is the definition of peatland restoration?
6. What are the goals or desired outcomes of restoring peatland?

B. **Stakeholders' awareness of the Londerang peatland restoration project**

7. Are you familiar with the restoration project in HLG Londerang funded by the Republic of Korea? If yes, which component/activity are you most familiar with?
8. Have you ever been involved in any restoration project in HLG Londerang in the past? Please elaborate.
9. If you have ever been involved in a restoration project in HLG Londerang, did you encounter any challenges on the ground?
10. What do you think about the current project outcomes?

C. Goals after the restoration project ends?

11. What do you think should be the next goal after the conclusion of the restoration project?

D. Important factors to be considered in achieving the goals

12. What are the factors considered crucial in fulfilling those goals?

Appendix 2: Participant information sheet

Participant Information Sheet

Researcher:
My name is Arifah Hidayati. I am originally from East Java, Indonesia, and am currently a Master's student at the Fenner School of Environment and Society, the Australian National University in Canberra, Australia. I am pursuing a Master of Forests (advanced) degree and conducting research for my thesis on a peatland restoration project in Jambi Province, Indonesia.

Project Title:
Stakeholder Perspectives in Sustaining Post-Project Peatland Restoration Outcomes: A Case Study in Jambi Province, Indonesia

General Outline of the Project:

- **Description and Methodology:**
  The peatland ecosystem is vital for Indonesia's climate goals, yet it faces high degradation risks. Despite numerous restoration programs involving many stakeholders, the national target to restore 2.4 million ha of peatland remains in 2020 unmet. Currently, there is a significant gap in the academic literature regarding stakeholder perspectives on ensuring sustained outcomes after project funding ends. This study will focus on the "Restoration of Burnt Peatland" project in Londerang Peat Protected Forest in Jambi. It will investigate the perspectives of different stakeholders involved in the project, regarding their expectations and objectives after the completion of the project, and the factors necessary to achieve these goals. I will use semi-structured interviews and field & participant observations, to collect the research data.

- **Participants:**
  I will conduct individual interviews with representatives from various categories of key stakeholders involved in the "Restoration of Burnt Peatland in Jambi" project in Londerang Peat Protected Forest. These stakeholder categories encompass project donors, local communities, government institutions, NGOs, research institutions and universities, and private companies. The proposed number of participants for this research is 20 individuals.

- **Use of Data and Feedback:**
  The data gathered during fieldwork will be analysed for my thesis. Upon completion of my thesis, a summary of the research findings will be shared with the participants through email or other mutually agreed-upon communication channels.

- **Project Funding:**
  This research is funded by the Fenner School of Environment and Society at the Australian National University.

Australian National University

Participant Involvement:

- **Voluntary Participation & Withdrawal:**
  Your participation in this research is voluntary, and there is no coercion involved. You have the right to withdraw from the study without needing to provide a reason, up until one week after the interview has been conducted. Additionally, you are free to refrain from answering any questions during the interview that you do not wish to address. Should you choose to withdraw from the research, please inform directly or indirectly (via email, telephone, or WhatsApp), and the information you have provided will no longer be used and will be destroyed accordingly.

- **What does participation in the research entail?**
  Upon agreeing to participate in the research, each participant will undergo an interview consisting of a series of questions as follows:
  - Their understanding and awareness of peatland ecosystem, degraded peatland, and its restoration
  - Their understanding and awareness of the "Restoration of Burnt Peatland" project in Londerang Peat Protected Forest
  - Their expectation or goals after the project completion and important factors to be considered in achieving those goals.

  The interview will be recorded audio and written notes will be made. The researcher will also make field notes during field and participant observations. Video recording will not be utilised during data collection. I will securely store all data and ensure it remains inaccessible to any other individual other than me and my research supervisors.

- **Location and Duration:**
  Interviews will take place either in person at a mutually agreed upon location and time, or online via Zoom. The interview will take no longer than 60 minutes.

- **Risks:**
  This research topic focuses on the restoration of degraded peatlands. Some participants may have experienced disasters related to this issue, such as peatland fires or droughts, which could be sensitive and cause discomfort. It is also possible that participants may be involved in activities that are, or could be considered, as inconsistent with the project objectives. Some participants may wish to express negative views about the project and may be concerned that these views will not be well-received by those associated with the project. To mitigate these risks, you are not obligated to answer any questions that make you uncomfortable. Similarly, in relation to any information about illegal activities that may be disclosed during the research, you are not obligated to provide any information that makes you uncomfortable or that you believe may prejudice your interests. I will not be recording or reporting any details that could identify specific cases or individuals.

  There is also a risk that participants may be identified by third parties. To ensure the confidentiality of the participants, the researcher will contact prospective interviewees directly without going through intermediaries. The researcher will not disclose any names to other parties during the fieldwork or in the final research report to minimise this risk further.

- **Benefits:**
  It is unlikely that you will personally benefit from participating in this research. However, your involvement will significantly contribute to generating knowledge about what happens to peat restoration efforts in Indonesia after the funding period ends and further understand the stakeholders' concerns, motivations, and goals for peatland restoration.

Confidentiality:

- **Confidentiality:**
  Confidentiality will be maintained during both data collection and result publication as far as the law allows. Access to the data will be restricted to myself as the Principal Investigator and my supervisors. The published material will not have any information or means of identifying individuals.

Privacy Notice:
In collecting your personal information within this research, the ANU must comply with the Privacy Act 1988. The ANU Privacy Policy is available at https://policies.anu.edu.au/ppl/document/ANUP_010007 and it contains information about how a person can:

- Access or seek correction to their personal information;
- Complain about a breach of an Australian Privacy Principle by ANU, and how ANU will handle the complaint.

Data Storage:

- **Where:**
  All written notes will be securely stored in a locked bag or cabinet until they are transcribed into electronic files. Additionally, electronic data, including audio recordings and photos, will be transferred from the recording device and camera to a password-protected ANU computer. Furthermore, this data will be backed up on a password-protected ANU student account, personal laptop, and portable hard drive for added security.

- **How long:**
  All data used in this thesis research will be stored as digital files and retained for up to twenty years from the thesis submission date (referring to Law of the Republic of Indonesia No. 11 of 2019 concerning the National System of Science and Technology).

- **Handling of Data following the required storage period:**
  Should the data remain unused after this storage period, all electronic data will be deleted, and written data will be destroyed.

Queries and Concerns:

- **Contact Details for More Information:**
  If you have any questions or concerns regarding this research, please contact me as the Principal Investigator:

Arifah Hidayati
Fenner School of Environment and Society
College of Science

Appendix 3: Consent form

Australian
National
University

CONSENT FORM for research participants

[Stakeholder Perspectives in Sustaining Post-Project Peatland Restoration Outcomes: A Case Study in Jambi Province, Indonesia]

I have read and understood the Information Sheet you have given me about the research project, and I have had any questions and concerns about the project (listed here

____
____)

addressed to my satisfaction.

I agree to participate in the project. YES ☐ NO ☐

I agree to this interview being audio-recorded YES ☐ NO ☐

I agree to be identified in the following way within research outputs:

Pseudonym YES ☐ NO ☐

No attribution YES ☐ NO ☐

Signature:…………………………………………… Date:…………………………………………………

TEQSA Provider ID: PRV12002 (Australian University)
CRICOS Provider Code: 00120C

Australian
National
University

ORAL CONSENT SCRIPT for research participants

(translated into Bahasa Indonesia)

[Stakeholder Perspectives in Sustaining Post-Project Peatland Restoration Outcomes: A Case Study in Jambi Province, Indonesia]

I have read to you the Information Sheet about the research project.
Was this information clear? Do you have any questions about the project?

Do you agree to participate in this project?

- Do you agree for this interview to be audio-recorded?

When I prepare the research outputs, I can attribute information to you in three ways: full name, pseudonym, or I can use NO attribution and hold your information confidentially.

- Would you like to be referred to using a pseudonym (false name)?
- Would you prefer that your information be not attributed to anyone at all?

May we start the interview now?

Date of script being read:...