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## A COMPARATIVE STUDY OF DIFFERENT PRACTICES IN ENVIRONMENTAL IMPACT ASSESSMENT

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### Abstract

Currently, there are two practices to assess the environmental and social impacts of the power development projects in Indonesia, namely Indonesia Environmental Impact Assessment (EIA) or Amdal and Environmental and Social Impact Assessment (ESIA) based on the International Finance Corporation (IFC) Performance Standards. However, the ESIA practices in Indonesia, in particular, have yet to be thoroughly examined in the academic context. This research compares the procedural features and environmental and socio-economic aspect coverage of Indonesia's EIA against the IFC (IFC PS) ESIA. A document analysis was employed to systematically analyze the main divergences and similarities contrasted with applicable Indonesian regulations and IFC PS. The results show distinctive differences between Indonesia's EIA and ESIA regarding screening, public participation, scoping, the study of alternatives, impact analysis, review and decision-making, environmental management plans and follow-up, and complementary parallel studies. The research also found that EIA is lacking in covering aspects of ecosystem services, labor, groundwater, landscape and visual impacts, cultural heritage, community safety and security, and non-routine activity or unplanned events. The identified gaps could suggest improvement to ensure Indonesia's EIA and ESIA practices in Indonesia align and provide benefits for sustainable development.

**Keywords:** Environmental impact assessment; ESIA; IFC Performance standards; Indonesia.

### 1. Introduction

Large-scale projects carry high environmental risks and can significantly transform the physical, biological, and social environment (Aung et al., 2020; Glasson et al., 2019; Hacking, 2019; Ho et al., 2020). Hence, at the project planning stage, it is critical to assess the environmental and social impacts of the proposed projects to prevent and mitigate adverse environmental damage, social conflicts, and financial losses. In current practice, there are two instruments to assess the environmental impacts of power development projects in Indonesia. Firstly, Indonesia EIA, or *Analisis Mengenai Dampak Lingkungan* (Amdal), aims to comply with Indonesian legislation requirements and standards. In general, Amdal assessed proposed businesses/projects concerning relevant Indonesian policies and their likely consequences to the environment's social and biophysical components (Dhiksawan et al., 2018). Secondly, ESIA is guided by the financiers' environmental and social frameworks and Good

International Industry Practice (IFC, 2012). This new approach to impact assessment has emerged from an integrated perspective that acknowledges and evaluates social matters equally (Gulakov et al., 2020a; Vanclay, 2020). It responds to the increasing awareness to capture the intense and complex interrelationship linking land and society (Climent-Gil et al., 2018; Iglesias-Merchan & Domínguez-Ares, 2020; Mottee et al., 2020). The ESIA is particularly mandatory to obtain financing from international agencies, multilateral donors, and private lending institutions (Equator Principles, 2020; IFC, 2012).

However, the differing approaches result in gaps between the Indonesia EIA process and the ESIA perspective, which may result in failure to address actual societal problems (Borgert et al., 2019). Subsequently, donors or investors require the project sponsor to conduct a separate ESIA, although EIA and environmental permits for the proposed project have been granted in the scheme. This phenomenon raises a question of the differences between these systems, which lead to the development of two separate documents with a common theme and objective.

Power, mainly generated from liquefied natural gas (LNG), has become a center of interest since it has received significant foreign direct investment (FDI) inflows (United Nations Conference on Trade and Development (UNCTAD), 2022) due to its role in bridging the transition to cleaner energy (Fragkos et al., 2021; Hasudungan & Sabaruddin, 2018). The adoption of the ESIA in LNG-to-Power as a decision-making tool for projects is a relatively recent practice. However, since the 1970s, EIA has become an essential tool to support decision-making and a mean to align and integrate the three pillars of sustainable development (Coutinho et al., 2019; Glasson et al., 2019; Viliani & Harris, 2020). Since the introduction of EIA, there have been numerous reforms in the theoretical basis, procedures, agenda, and regulations to resolve the weakness in the former EIA process (Dhiksawan et al., 2018; Iglesias-Merchan & Domínguez-Ares, 2020; Nita et al., 2022; Zahroh & Najjicha, 2022). This has led to the creation of ESIA, intended to answer the dissatisfaction in the EIA systems (Quigley, 2021).

A growing body of literature has been published on Indonesia's EIA in the past five years. Dhiksawan et al. (2018) review the history and regulatory framework of the system. Law enforcement, however, is weak, with ineffective penalties for non-compliance (Zahroh & Najjicha, 2022). Accountability of public participation in the EIA process has been debatable, which majority of authors highlight insufficient provision of information, incompatible participation methods, and procedural injustice (Kurniawan et al., 2020; Kurniawan et al., 2021; Lai & Hamilton, 2021). Further, a comparative review of EIA in South East Asia countries reveals that Indonesia's EIA does not specify the importance of climate change, biodiversity offset, and the requirement to consider alternative actions (Swangjang, 2018). The critical opportunity lies in promoting the actors' capacity in EIA preparation and approval to enhance the overall system effectiveness (Cristina et al., 2022; Kurniawan et al., 2019).

Few scientific publications have been released on ESIA and IFC PS which predominately examine their implementation overseas, including in China (Narain et al., 2020), Cambodia (Quigley, 2021), Uganda (Kahangirwe & Vanclay, 2022), and Russia (Gulakov et al., 2020b). Though ESIA in Indonesia is widely applied by multilateral donors, international agencies, and private lending institutions, limited research has been published. A study by Siregar and Utomo (2019) reviewed the differing public participation between Indonesian regulation and Equator Principal requirements. However, it is inadequate in catching the broader aspects of ESIA and Indonesia EIA.

While the literature has explored gaps in Indonesia's EIA, less work has examined the ESIA practice in Indonesia and how these two systems contrast despite the common theme. The authors seek to fill this gap by identifying the main similarities and divergences between the two systems in administrative frameworks, procedural features, and environmental and socio-economic aspects of Indonesia's EIA and ESIA. Among applicable international frameworks for ESIA, the discussion is scrutinized to International Finance Corporation Performance Standards for Environmental and Social Sustainability (IFC PS). This study is critical because FDI for the power industry will increase rapidly in Indonesia in the next few decades, requiring EIA and ESIA in the decision-making process. This aligns with the National Electricity Supply Business Plan (RUPTL) 2021-2030 ([National Electricity Company \(PLN\), 2021](#)) to increase power production by 40.6 GW for the next ten years through Public-Private Partnership (PPP) and multilateral funding.

An in-depth understanding of Indonesia's EIA and ESIA is required to efficiently and effectively implement the two studies. Ultimately, this article contributes to the literature by providing insights on EIA's and ESIA's core elements and advancement potentially presented by the assessment method. Due to the limited number of scientific articles about the EIA and ESIA in power projects in Indonesia, relevant government and agency reports, regulations, and guidelines are included to strengthen the completeness of the review and promote a balanced picture of the available evidence.

## 2. Methods

This research adopted a qualitative approach that enables a study of the complexity and extensiveness of EIA and IFC PS-based ESIA practices and procedural features in Indonesia through complex interactions among policy, guidelines, and implementing factors, which may have been lost within a quantitative research approach. Because they are anchored to different guidelines and have their unique system, the comparative studies of [Swangjang \(2018\)](#), [Hasan et al. \(2018\)](#), and [Aryal et al. \(2020\)](#) were adopted. A specific LNG-to-Power project was chosen to enable a deeper understanding of the main elements that influence the overall procedures and output of the EIA and ESIA ([Hasan et al., 2018](#); [Kurniawan et al., 2020](#); [Loomis & Dziedzic, 2018](#)).

Document analysis was then employed to review the whole pack of EIA, and ESIA reports, follow-up reporting documents, supporting documentation, relevant regulations, IFC PS, and other relevant guidelines. The analysis has been structured in adherence with checklists from [United Nations Environment Programme \(UNEP\) & United Nations Development Programme \(UNDP\) \(2010\)](#). They are designed to investigate the primary information provided in EIA and ESIA reports, the critical features of the impact analysis, the mitigations, and public participation, along with the environmental, social, and economic aspects covered. All checklist data from document analysis were described using the descriptive qualitative method, which clearly explains the similarities and differences between EIA and IFC PS-based ESIA. The key takeaway from the results could suggest the EIA and ESIA practice trends and some proposals for improvement. The authors have full access to the complete set of EIA and ESIA reports of the selected project, making this work possible. Covid-19 cases fluctuated, so the document analysis was conducted remotely from May-October 2022.

The project involves constructing, operating, and maintaining a 1,760-megawatt (MW) LNG-to-power project located in Karawang Regency, West Java, approximately 100 kilometers (km) east of Jakarta. Indonesia's Independent Power Production (IPP) developed and operated the project under a 25-year power purchase agreement (PPA) with the

Indonesian utility company. Figure 1 depicts the power plant's aerial view. The presence of agricultural fields and residential buildings characterizes the site. The jetty area is adjacent to mangrove forests and fishponds.



Figure. 1 Aerial view of the project site context  
(Source: Esri, 2023)

### 3. Results and Discussions

The results from the document analysis of reports and relevant regulations and guidelines are presented in Table 1–Table 5. They are categorized into different impact assessment phases and described in the subsections below, where key differences or similarities between EIA and ESIA practices are identified. Differences between the EIA regulation and ESIA guidelines due to legislative provisions and financier mandatory requirements are outlined in the first subsection.

#### 3.1. Administrative framework

##### 3.1.1. Indonesia EIA regulations

Systemic measures Indonesia EIA is made clear in Act Number 32/2009 regarding environmental protection and management. Article 1 of the act defines EIA as a study of significant and notable impacts of a proposed business and activity on the environment. It is compulsory for the decision-making process on the implementation thereof. Subsequently, in 2021, Government Regulation (GR) Number 22/2021, an implementing regulation for environmental protection and management that provides for comprehensive guidelines on EIA process and environmental approval, was established. It also mandates that the proposed project location complies with local spatial planning.

Screening of an activity requiring an impact assessment study is required under the Minister of Environment (MOE) Regulation Number 05/2022. Following the enactment of GR 22/2021, a new EIA screening criteria was set on MOE Regulation Number 05/2021. The highlighted activities are primarily unchanged, which are those activities that are likely to have significant, adverse, and irreversible impacts on the environment that include: (a) changes in land and landscapes; (b) natural resources exploitation (both renewable and non-renewable resources); (c) processes and activities with the potential to generate waste and pollution and to cause environmental damage and natural resource degradation; (d) processes and activities which transform the natural and built environment, including social and cultural environment; (e) processes and activities which impair the protection of conservation area and cultural heritage; (f) introduction of micro-organisms, plant and animal species; (g)

utilization of natural resources including living natural resources; (h) high risk toward national defense; and (i) novel technology which highly impact the environment.

According to MOE Regulation Number 16/2012, EIA consists of terms of reference (ToR), environmental impact assessment, and environmental management and monitoring plan (EMP). Public participation in the EIA process is mandatory and can start as early as prior to the ToR preparation. Relevant technical approvals, i.e., hazardous waste, wastewater discharge, and exhaust emissions, shall be obtained before environmental impact assessment submissions. The EIA study team shall possess a certificate of competence. The review process is carried out by the Environmental Feasibility Study Team (previously Assessment Commission), consisting of representatives from the ministry, local agencies, and environmental specialists. The EIA system emphasizes the EMP in the EIA follow-up step. Once the EIA is approved, environmental approval (previously environmental permit) will be issued for commencement by the minister, governor, or regent/mayor, depending on the project context and boundary. For the case study, the Minister of Environment and Forestry issued the environmental permit. The approval can be revoked if the project proponent shows consistent nonconformance against EMP. The approval authority owns control over EMP and project monitoring. Other relevant EIA regulations are outlined in Table 1.

Table 1. Principal regulation and guidelines of EIA and ESIA

Regulation/Guideline	Content
<b>EIA</b>	
Act Number 32/2009	Environmental protection and management
Government Regulation Number 22/2021*	Implementing regulation for environmental protection and management, one of which provides comprehensive guidelines on the EIA process and environmental approval
Minister of Environment and Forestry (MOEF) Regulation Number 18/2021*	Certification of EIA competency, EIA consulting services, and environmental feasibility study
Minister of Environment (MOE) Regulation Number 05/2012**	Environmental impact assessment/EIA Screening criteria (types of commercial plan or activities that need to undertake an EIA)
MOEF Regulation Number 4/2021*	New screening criteria for impact assessment (types of commercial plan or activities that need to undertake an EIA, UKL-UPL, or SPPL)
MOE Regulation Number 8/2013**	Procedures, assessment, and examination of environmental documents and issuance of environmental permit
MOE Regulation Number 3/2013	Environmental audit and certification for the auditor
Government Regulation Number 27/2012**	Environmental permit concerning EIA
MOE Regulation Number 16/2012	Guideline on environmental document preparation
MOE Regulation Number 17/2012	Public participation and information disclosure in environmental impact assessment and environmental approval
MOE Decree Number 45/2005**	Guidelines for the preparation of mitigation, management, and monitoring report
MOEF Regulation Number P.22/MENLHK/SETJEN/KUM.1/7/2018	Norms, standards, procedures, and criteria for Online Single Submission (OSS)
Head of BAPEDAL Decree Number 299/11/1996	Technical guidelines for social aspect review in preparation for EIA
Head of BAPEDAL Decree Number 56/1994	Guidelines on potential impacts
<b>ESIA</b>	

Regulation/Guideline	Content
IFC Performance Standards for Environmental and Social Sustainability 2012	A benchmark for identifying and managing environmental and social risks in projects
World Bank Group Environment, Health, and Safety (EHS) General Guideline	General examples of Good International Industry Practice (GIIP) are referred to in IFC Performance Standards
World Bank Group EHS Guideline for Thermal Power	Electric utility industry-specific examples of GIIP are referred to in IFC Performance Standards
World Bank Group EHS Guideline for Electric Power and Distribution	

Note: \*New regulation as per 2021; \*\*Used in the case study EIA document but now is obsolete

### 3.1.2. ESIA Guidelines

International Finance Corporation, a member of the World Bank Group, released a set of Performance Standards (PS) based upon the original World Bank Group Safeguard Policies, which further recognized the specific issues associated with private sector projects. 2012 The IFC PS was updated to include greenhouse gases, human rights, community health, and safety and security. There are eight PS addressing issues of risk management, labor, resource efficiency, community, resettlement, biodiversity, indigenous people, and cultural heritage. The IFC PS is typically applied to development projects in Indonesia where the projects receive financing from commentarial banks, which are signatories for the Equator Principles or form IFC directly.

Performance Standard on Social and Environmental Assessment and Management Systems guides the ESIA preparation and broadly aligns with the EIA basic principles. The ESIA process starts with a screening process, considering project scale and risks. This is followed by scoping the assessment process based on the initial screening and risk assessment outcome. Stakeholder identification and consultation is an integral part of the ESIA preparation. ESIA report comprises scoping report, impact identification and analysis, environmental and social management plan (ESMP), and associated management action plans. The ESIA process shall align with good international industry practice, meaning the exercise shall be carried out by professionals with extensive experience undertaking similar assessments globally or regionally.

Further, the environmental management plan of ESIA shall follow World Bank EHS Guidelines, both general and industry-specific, which outline approaches to EHS management and environmental quality standards generally considered practical in new facilities with existing technology and at a reasonable cost (IFC, 2007). Approval of ESIA leads to approval of project financing from lenders. IFC PS also requires an ESMP and the associated action plan to incorporate mitigation and monitoring required as set out in the ESIA. Reporting of the Projects Sponsors' environmental and social performances against the ESMP and approved plans or the duration of the loan period is required. Nonconformance with the approved plans may result in termination of the financial assistance or higher bank interest than the original contract.

## 3.2. Procedural features

### 3.2.1. Screening

Generally, Indonesia EIA and IFC PS-based ESIA follow the common EIA steps applicable globally (Clarke & Vu, 2021; Hasan et al., 2018; Jha-Thakur & Khosravi, 2021; Khosravi et al., 2019; Nita et al., 2022; Otwong & Phenrat, 2017; Soria-Lara et al., 2020; Swangjang, 2018), which starts with the screening and all the way to follow up and environmental

management plan. Both deploy a multidisciplinary team and methods in stakeholder engagement, impact identification, and assessment (Byambaa & de Vries, 2019; Glasson et al., 2019; Loomis & Dziedzic, 2018). Though the general steps are not dissimilar, each step has different procedural features.

The Indonesia EIA and ESIA screening processes differ procedurally, as outlined in Table 2. The EIA screening is carried out in one step by referring to the project type and threshold set in the regulation. Should the project exceed the threshold, EIA is mandatory. On the other hand, ESIA is conducted with a holistic approach by a multidisciplinary team. The process typically starts by defining project magnitude, boundary, emissions, and scientific rationale. The case study is a large-scale LNG-to-power project projected to significantly transform the environment, communities, and economy (Hacking, 2019). The impact could be adverse or unprecedented, requiring a comprehensive impact assessment study. The initial process also typically involves reviewing design information, desk-based baseline data, and local and national policies to determine the planning framework and limitations for the study. For the study, national strategic goals, such as energy transition and universal electricity access, were evoked as key propositions supporting the proposed development. However, aligning with sustainable goals is missing in EIA documents as it focuses on meeting local and national legislation requirements. ESIA references relevant, sustainable commitments, particularly those Indonesia is a signatory.

Table 2. General features of EIA and ESIA

Study phase	Procedural features	EIA	ESIA
Screening	Screening based on project type and threshold	√	√
	Screening based on project location, scale, sensitivity, and the magnitude of potential environmental impacts, including direct, indirect, induced, and cumulative impacts.	-	√
	Deployment of a multidisciplinary team; a holistic approach	-	√
	Regulatory and planning framework review	√	√
	Reference to sustainability goals established at the national/regional level	-	√
Scoping and analysis of alternatives	Scoping (with public participation)	√	√
	Discussion of project alternatives	√	√
	Analysis of alternatives to include design, technology, and components, aside from location	-	√
	Consideration of “no project” alternative	-	√
	Baseline data	√	√
	Physical environmental baseline data captured seasonal variation.	-	√
	Socio-economic survey of people impacted by land acquisition and loss of access to resources	-	√
	Associated facilities	-	√
Impact analysis	Screening of Indigenous people	-	√
	Identification of vulnerable group	-	√
	Multidisciplinary impact analysis	√	√
	Impacts from non-routine activities	-	√
	Cumulative impacts	-	√
	Residual impacts	-	√
	Quantitative risk analysis	-	√
EIA review and decision making	Disclosure of impact assessment results	√	√
	Formal reviews	√	√
	The proposal returned for revision and resubmission.	√	√
	Final decision: approval or acceptance	√	√



Study phase	Procedural features	EIA	ESIA
Follow-up and environmental management plan (EMP)	Provision of the environmental management plan (EMP)	√	√
	Clear specification of method statements	√	√
	Presence of estimated budget in EMP	-	√
	Provision of environmental and social management system (ESMS) and associated action plan	-	√
	Periodical reporting of EMP implementation	√	√
	Monitoring and audit	√	√
Parallel studies	Greenhouse gas assessment	-	√
	Traffic assessments	√	√
	Flood risk study	-	√
Public participation	Early and ongoing public participation	√	√
	Stakeholder engagement plan	-	√
	Provision of grievance mechanisms	-	√
	Stakeholder engagement plan	-	√
	Disclosure of impact assessment	√	√

Note: √ = available; - = not available

### 3.2.2. Scoping and analysis of alternatives

The EIA and ESIA scoping phase is accomplished through public participation to inform the key stakeholders with relevant information about the project (i.e., design, timeline, and potential impacts and opportunities), capture feedback, and set priorities thereof. The results are summarized in the scoping reports and integrated with the study's next steps. For alternative analyses, despite required by MOE Regulation Number 16/2012 to explore possible alternatives in terms of location, design/technology, and components, EIA tends to focus highly on location (Ministry of Environment and Forestry, 2019; Ministry of Finance, 2016) and diminishes the rest. The discussion is lacking, emphasizing that that project location is final and hence alternative is limited (Kurniawan et al., 2020). ESIA analyses of alternatives, in contrast, consider alternative locations, fuel sources, and technology/design. The “No project” alternative is also discussed. This is commensurate with a desire for transparency in the impact assessment process and willingness to explore all feasible options objectively to facilitate balanced decision-making to achieve sustainable development (Rathi, 2021).

The scoping phase also involves baseline data collection through environmental and social samplings and surveys. The key findings are (1) ESIA baseline data for the physical environment captures seasonal variation (dry and wet seasons) in order to provide the appropriate level of detail; (2) ESIA undertakes a socio-economic survey which results are used as a basis to determine the number of vulnerable people impacted by the project, those who are physically and economically displaced; and (3) indigenous people screening is part of ESIA scoping study. These are not available in the EIA process. The indigenous people screening reveals that no indigenous people are present within the area of project influence and hence, not a relevant aspect of the project.

In determining the study boundary, EIA employs the outermost boundary of the overlay of the project area, ecological, social, and administrative boundaries. ESIA adopts a different approach. Instead of project boundaries, the study set the project area of influence encompassing areas exposed to direct and indirect impacts, associated facilities (i.e., utilities, waste facility, port, hospital, roads, etcetera), and cumulative impacts. Some of the associated facilities are located beyond the EIA study boundary.

### 3.2.3. Impact analysis

The impact analysis of both EIA and ESIA is undertaken using scientific methods, expert judgment, and public consultation. However, the differing guidelines attributed to gaps in procedural features and covered aspects. The impact analysis phase of the EIA assesses the significant hypothetical impacts (DPH) identified in the scoping. Any impacts not considered a DPH are not carried forward in the analysis but incorporated in the environmental management and monitoring plan. The ESIA does not discriminate impacts meaning that all significant and less significant impacts are addressed in the impact analysis. Moreover, ESIA underscores the importance of cumulative and residual impact identification and evaluation. EIA fails to consider these types of impacts in the assessment, a common drawback of the practice (Asian Development Bank (ADB), 2019; Ministry of Finance, 2016). This translates to an urgency to improve the capacity of EIA practitioners in assessing cumulative and residual impacts. In addition, ESIA scopes in an impact study from non-routine activities and a quantitative risk assessment to capture the overall environmental and social risks associated with the project. They are not present in EIA.

Table 3 outlines the environmental and social aspects scoped in the study. EIA impact analysis does not cover the following aspects: groundwater quality, landscape, and visual effects, waste generation, ecosystem services, community access, hazardous substances, cultural heritage, community safety, and impact from non-routine activity or unplanned events. These missing aspects, however, are covered in ESIA systems. Mainly ecosystem services and critical habitat assessment, there is an emerging trend to include this aspect in environmental assessment as a good practice to improve mitigation or enhancement measures (Cook et al., 2019; Sousa et al., 2020). This also aligns with the Convention on Biological Diversity (2004) recommendations of employing an ecosystem approach to decision-making.

Table 3. Environmental and social aspects were scoped in the study.

Aspects	Indonesia EIA	ESIA
Air quality	√	√
Odor	√	√
Greenhouse gas emission	√	√
Noise and vibration	√	√
Soil quality	√	√
Groundwater quality	-	√
Surface water quality	√	√
Marine water quality	√	√
Landscape and visual effects	-	√
Waste generation (including hazardous waste)	-	√
Hazardous substances	-	√
Terrestrial biodiversity	√	√
Aquatic biodiversity	√	√
Habitat	√	√
Ecosystem services	-	√
Land acquisition and economic displacement-related impact	√	√
Community income and livelihood	√	√
Job and business opportunity	√	√
Impact on existing businesses or industries	√	√
Community access (public rights of way)	-	√
Cultural heritage	-	√
Land and marine traffic	√	√

Aspects	Indonesia EIA	ESIA
Community health	√	√
Community safety	-	√
Public perception	-	√
Pressure on existing public facilities	-	√
The impact of non-routine activity or unplanned events	-	√

Note: √ = scoped in and monitored; - = neither scoped in nor monitored

### 3.2.4. EIA review and decision making

EIA and ESIA benefit from external parties' formal reviews, particularly during document submissions. The process of EIA review is carried out by the Assessment Commission (now the Environmental Feasibility Study Team), consisting of representatives of local authorities and subject matter experts. This review process allows for EIA revision to accommodate inputs from the reviewers. Once approved or accepted, the environmental permit (now environmental approval) is issued. A similar process applies to ESIA. The financier, supported by relevant experts, executes the review process to ensure compliance with IFC PS requirements. The review process accommodates revisions of the documents to improve the quality of ESIA. Approval for financial assistance is provided once the ESIA is accepted. The analyzed project has obtained both EIA and ESIA approvals.

### 3.2.5. Follow-up and environmental management plan (EMP)

The EIA and ESIA case studies cover assessments for the construction and operational phases. A separate decommissioning EIA and ESIA will be developed before the decommissioning phase. Under the PPA contract, after 25 years of operation, the asset ownership will be transferred to PLN. No decision was made during the EIA and ESIA study on what activities will be included after the asset transfer.

As detailed in Table 2, the EIA procedural features on follow-up and EMP phase show a significant discrepancy with those for an ESIA. Typical EIA follow-up and EMP were developed to comply with key regulatory requirements (Borgert et al., 2018; Borgert et al., 2019), namely provision of EMP, specification of method statement, provision for decommissioning, CSR, and emergency response plan. A distinct feature of ESIA EMP is unlike EIA EMP. It provides an estimated budget for the management and monitoring plan. Other prominent features of ESIA are the provision of ESMS and associated management action plans that address the issues of interest in impact assessment. These action plans are derived from the EMP. This includes biodiversity action/offset plan, CSR, chance finds procedure, emergency response plan, local recruitment and procurement plan, spill management plan, occupational health and safety management plan, worker training plan, pesticide management, resettlement action plan, livelihood restoration plan, and worker accommodation and management plan. Indigenous people's plan is a standard feature of ESIA (IFC, 2012) but is irrelevant to the analyzed project.

Table 4 outlines the comparative review of EIA and ESIA mitigation measures. The case study ESIA covers broader environmental, social, and economic aspects than EIA does. Occupational health and safety (OHS) measures are not addressed in EIA as the principal EIA regulations do not specify the requirement to include this aspect.

As for EMP implementation reporting, EIA regulation mandates a six-monthly report to be delivered to the respective authority throughout the project lifecycle. The analyzed project provides periodic reporting to MOEF and copies the local environmental agency. ESIA EMP implementation is reported to the financier on a semester basis during the construction phase  
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and annual basis during operational phase. The report is made publicly available on the financier's website.

Table 4. Mitigation measures considered in the case studies in addition to “mitigation by design.”

Mitigation measures	Indonesia EIA	ESIA
Additional habitat survey prior to construction	-	√
Management system certification (national or international)	√	√
Drainage system	√	√
EMP	√	√
Landscaping, replanting with local species	√	√
Reinstatement of interfered infrastructure	√	√
Site reinstatement	√	√
Air quality management	√	√
Corporate social responsibility plan	√	√
Resettlement action plan	-	√
Livelihood restoration plan	-	√
Chance finds procedure	-	√
Emergency response plan	√	√
Local recruitment and procurement management	√	√
Noise and vibration management	√	√
Spill contingency management	-	√
Security management	-	√
Soil management	√	√
Groundwater management	-	√
Stakeholder engagement plan	-	√
Surface water management	√	√
Biodiversity action/offset plan to achieve no-net loss and net-gain	-	√
Traffic management	√	√
Waste management	√	√
Occupational health and safety management	-	√
Worker training	-	√
Worker accommodation management	-	√
Human resource management plan (including retrenchment)	-	√
Indigenous people management	-	*

Note: √ = present; - = not present; \*=common feature but not relevant aspect of the case study

### 3.2.6. Parallel studies

The analyzed EIA and ESIA are accompanied by parallel technical studies which complement and support the studies. Under EIA practice, traffic assessment has been performed for traffic impact appraisal due to regulations in force. As presented in Table 3, aside from technical studies, ESIA was supplemented by greenhouse gas assessment and flood risk study. While there is plenty of scope for using EIA to increase project resilience, this aspiration to incorporate climate change impacts and adaptation is rarely realized in practice (Hacking, 2019).

### 3.2.7. Public participation

Public participation is a substantial part of EIA and ESIA. Assuring a participatory process is pivotal because it improves the decision-making quality (Bouzuenda et al., 2019; Zhou et al., 2019) However, these two practices have a few differences, as outlined in Tables 4 and 5. Firstly, the formal EIA public consultation is kicked off through disclosure in the newspaper, DOI: <https://doi.org/10.7454/jessd.v6i1.1195>

followed by consultation with impacted communities. The ESIA consultation commenced during the scoping study, followed by disclosure on online or offline media. Secondly, the ESIA consultation is presented in the Stakeholder Engagement Plan (SEP), and the consultation undertaken is tracked and recorded throughout the project lifecycle. The EIA consultation requires no consultation plan. Thirdly, the ESIA consultation acknowledges prior and informed consent in conducting consultation as it is ethical for research involving humans (Bromwich & Millum, 2021; Josephson & Smale, 2020), but the EIA process does not require such consent. Lastly, the ESIA consultation provides a grievance mechanism that enables affected communities to lodge complaints with the project sponsor. This is widely circulated to the project-affected people but not addressed in the EIA process. The authors argue that public consultation in EIA treats the affected community as an object (Siregar & Utomo, 2019; Kurniawan et al., 2020), while ESIA underscores the meaningful and ethical consultation (indicated by prior and free, informed consent), acknowledging the community as the subject of the process, supported by stakeholder engagement plan which guides the project sponsor in effective stakeholder participation throughout the life of the project.

### 3.3. Influence of Indonesia Legislative Provision and IFC Performance Standards

The above discussion has explored the different procedural features and aspects of EIA and ESIA. The EIA lacks sustainability because ecosystem services, climate change adaptation, biodiversity offsets, and consideration of alternative plans are insufficiently analyzed or scoped out (Swangjang, 2018). This subsection examines how legislative provisions and standards have influenced this gap. Table 5 summarizes the comparative review between IFC PS requirements and Indonesia Regulations and how these differing features are reflected in EIA and ESIA. As for the national regulations, the authors pull EIA and relevant environmental and social regulations.

Table 5. Gap analysis between Indonesia regulations and IFC PS requirements

IFC PS Requirements	Indonesia Regulations	Implementation	
		Indonesia EIA	ESIA
<b>PS 1 - Assessment and Management of Environmental and Social Risks and Impacts</b>			
Project Screening	√	√	√
Environmental and social management system (ESMS) consists of the following elements: policy, risk & impact identification, management capacity, emergency response, stakeholder participation, and monitoring.	-	-	√
Baseline data as the basis of impact identification and evaluation	√	√	√
Transboundary impacts	√	√	√
The impact of a non-routine or unplanned event	-	-	√
Associated facilities	-	-	√
Impact assessment to consider the vulnerable group	-	-	√
Analysis of alternatives to include design, technology, and components, aside from location	√	-	√
Organizational competency and capacity	√	√	√
Emergency response plan	√	√	√
Environmental monitoring and audit	√	√	√
Public participation and information disclosure	√	√	√
Prior and informed consultation (consent)	-	-	√
External communication (publicly available monitoring report)	√	-	√
Grievance mechanisms (community and worker)	-	-	√

IFC PS Requirements	Indonesia Regulations	Implementation	
		Indonesia EIA	ESIA
<b>PS 2 - Labor and Working Conditions</b>			
Working conditions and management of worker relationship	√	-	√
Protecting the workforce (child labor and forced labor)	√	-	√
Occupational health and safety	√	-	√
Workers engaged by third parties	√	-	√
<b>PS 3 - Resource Efficiency and Pollution Prevention</b>			
Resource efficiency (water, energy, and other material)	√	√	√
Greenhouse gas emissions	√	√	√
Pollution prevention (water, air, soil)	√	√	√
Hazardous and non-hazardous waste management	√	√	√
Hazardous material management	√	-	√
Pesticide use and management	√	-	√
Adoption of World Bank EHS Guidelines and other international standards	-	-	√
<b>PS 4 - Community Health, Safety, and Security</b>			
Identification of risks and impact on community health, safety, and security	√	√	√
Consideration of community safety in project design	-	-	-
Community exposure to diseases	√	√	√
Security personnel	-	-	√
<b>PS 5 - Land Acquisition and Involuntary Resettlement</b>			
Classification of the displaced person includes affected persons with no recognizable legal right or claim.	√	-	√
Land compensation	√	-	-
Socio-economic survey of the project-affected households	-	-	√
Resettlement action plan	√	-	√
Livelihood restoration plan	-	-	√
Recognition of indirect impact (loss of access to land or asset)	-	-	√
<b>PS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources</b>			
Identification of risks and impact on biodiversity	√	√	√
Biodiversity offset with the target of no net loss and/or net gain.	√	-	√
Habitat assessment	-	-	√
Invasive species	√	-	√
Ecosystem services	√	-	√
<b>PS 7 - Indigenous Peoples</b>			
Identification of risks and impact on Indigenous people	√	*	*
Free, prior, and informed consent	-	*	*
Mitigation and development benefits to Indigenous people	-	*	*
<b>PS 8 - Cultural Heritage</b>			
Protection of cultural heritage or resources	√	-	√
Chance finds procedure	-	-	√
Community consultation on cultural resources	-	√	√
Consideration of indirect impact to include community access to cultural heritage	-	*	*

Note: √ = present; - = not present; \* = not relevant aspect for the case study and hence is not analyzed further.

As outlined above, IFC PS covers environmental and social issues than Indonesian regulations do. When host country regulations differ from the guidelines, the project is expected to achieve whichever is more stringent (IFC, 2012). Of the 8 PS, Indonesia

regulations fairly address PS 1, PS 2, PS 3, and PS 6 requirements but lack the remaining PS. This gap further translates to excluding such features or aspects in the EIA study.

This study also observed that despite exhaustive regulations for labor and working conditions, this aspect is scoped out from impact assessment. For biodiversity, PS6 is structured around the mitigation hierarchy, often with the overall goal of at least no net loss of biodiversity. EIA fails to enforce the commitment of no net loss. The ESIA of the case study consistently follows the IFC PS requirements, except for PS 7 and PS 8, given that no indigenous people and cultural heritage are present within the project area of influence. However, Chance Find Procedures are in place to anticipate any finding of cultural resources in the project footprint during earthworks. Further, IFC PS captures the Project's overall value chain, from upstream (materials, workers, and associated facilities) to downstream (waste and product distribution), a concept EIA practice needs to adopt.

ESIA has become a decision-making tool for international agencies, multilateral donors, and private lending institutions (lenders). The lenders highly depend on project cash flows from the project finance perspective. Robust management of environmental and social risks can minimize pressure on the project's early stages, thereby keeping the risk of default minimum (Rao, 2019). Consequently, IFC PS requires several procedures and environmental aspects beyond what Indonesia regulates. When host country regulations differ from the guidelines, projects are expected to achieve whichever is more stringent (IFC, 2012). In addition, lenders must ensure that project development contributes to sustainable development and foster full respect for human rights, which could affect their reputation (Calzadilla & Mauger, 2018; Ormaza & Ebert, 2019).

The authors argue that the strength areas of ESIA that EIA can adopt are seen in the extent to which the project sponsor has to (1) capture and mitigate impacts across the value chain and demonstrate (2) the commitment to adopt a mitigation hierarchy and where residual impacts remain, compensate/offset for risks and impacts to workers, affected community, and the environment (Narain et al., 2020; Narain et al., 2023); (2) the commitment to maximize socio-economic benefits for the host community (IFC, 2012; Ijabadeniyi & Vanclay, 2020; Omenge et al., 2020); and (3) the commitment and the organizational capability, in terms of human resources and budget, to implement the agreed environmental and social action plans. While Indonesia EIA restricts the enforcement of environmental and social commitments to regulatory authorities (Dhiksawan et al., 2018; Zahroh & Najicha, 2022), ESIA extends such enforcement duty to involve financial institutions (Rao, 2019). Subsequently, ESIA practice goes beyond the usual EIA practice.

The identified weak points could suggest improvements to ensure EIA and ESIA practices in Indonesia are aligned and provide benefits for sustainable development. What is potentially promising is the benchmarking of EIA regulations and standards against the IFC PS. Lenders typically adopt environmental and social safeguards best suited to their development context and thus result in one-size-fits-all standards (Narain et al., 2023; Ormaza & Ebert, 2019), often more stringent than the host country's regulations. However, where harmonization does occur, it provides an opportunity for the transfer of best practices (Morgado & Taşkın, 2019) to (1) improve the Indonesia safeguards systems and (2) increase the applicability of IFC PS in the country.

#### 4. Conclusion

The comparison of Indonesia EIA and IFC PS-based ESIA is focused on the regulatory framework and procedural features. This qualitative research used a document analysis approach to systematically analyze the main divergences and similarities contrasted with applicable Indonesian regulations and IFC PS. The difference between EIA and ESIA is influenced by regulations and standards which guide their process. The fact that ESIA practice addresses more environmental, social, and economic issues than EIA practices is evident. The identified shortcomings signal an area of improvement for EIA practice to ensure the study would benefit more in terms of sustainable development.

The study has some limitations which could suggest future research. Firstly, IFC PS is used as the ESIA guideline, among other safeguard policies. IFC PS is the most widely used environmental and social safeguard, with more than 86% of the development banks explicitly benchmarking their safeguards against it. Secondly, the authors' presumptions about the research topic can impede neutrality. For anticipating, this study employed consistent methodology, selecting appropriate project samples and rechecking collected data. Thirdly, the data is drawn from a limited project case. Generalizing specific issues highlighted in this article may not be possible, given the uniqueness of the project setting. However, the critical takeaway from studying EIA and ESIA of the selected project could provide insights for stakeholders and academia with similar contextual issues. Additional studies are recommended for further and more comprehensive results by selecting two or more project samples from different sectors or integrating with other parallel assessments, such as sustainability assessment, risk assessment, and cost-benefit analyses.

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#### Author Contribution

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