RISK ASSESMENT OF
PT INTERNUSA JAYA SEJAHTERA
PALM OIL PLANTATION
SOUTH PAPUA PROVINCE

[1]*RISK ASSESSMENT OF PT INTERNUSA JAYA SEJAHTERA PALM OIL PLANTATION SOUTH PAPUA PROVINCE*

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ABSTRACT

This assessment aims to identify risks of management of PT Internusa Jaya Sejahtera plantation in South Papua concerning the presence of flora and fauna, peat vulnerability, security of State-protected forests, potential encroachment, and mapping of risks from management of social aspects such as worker and community rights, along with other environmental issues. This assessment uses spatial data; Hansen map, GLAD map, map of forest and waters, peat map, Key Biodiversity Area (KBA) map, and Indicative Map of New Concession Issuance Moratorium (PIPPIB); in addition to the non-spatial one; data concerning complaints or negative issues concerning the company concession collected from online media. ArcGIS 10.5 is employed in the process of overlaying map data over the company concession boundaries. Spatial and non-spatial analysis produces scale of risks of the company concession (8,881.17 ha). The spatial analysis scores 3 (low risk) for spatial risk, while the non-spatial analysis scores 3 (low risk).

Keyword: *PT Internusa Jaya Sejahtera, risk, ArcGIS*

[1] https://www.interfaithrainforest.org/s/Interfaith_IssuePrimer_TropicalForestsClimateChange_ID.pdf

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1. INTRODUCTION

1.1 Background

Forest plays a vital role to hold against climate change impacts and limit the rise of global temperature up to 1.5^{o}C. Avoiding deforestation and land degradation as well as improved reforestation are a very important action to mitigate climate change, the result of which could contribute to one third of the mitigation efforts necessary until 2030 to efficiently keep the rise of global temperature below 2^{o}C[1].

Along with the company's improved understanding on deforestation and land degradation-related risks, it starts to develop a good governance system to manage them. Number of companies that have reported to have monitoring in place of deforestation and land degradation issues has significantly increased from 2017. Out of 96 companies that have reported to have used palm oil from Indonesia in 2019, 91% reported to have monitoring in place of deforestation and land degradation issues, increasing from 69% in 2017. This indicates how these issues have become increasingly important to company directors and how executives' capacity has been built to support mitigation actions to protect forests and other tree-vegetated areas.

Palm oil plantation development will continue on, implementing sustainable development principles and creating the balance between economic, ecological, and social aspects. From economic standpoint, natural resources are used to boost community income and serve as the State's foreign exchange to leverage local growth, advancement, and development distribution. From ecological standpoint, palm oil plantation development will provide benefits, such as optimised critical/abandoned lands, decreased land degradation/erosion, contribution to micro- and macroclimates, contribution to Greenhouse Gas (GHG) emission reduction, and balanced ecosystem. The presence of palm oil plantations also become the space to which biodiversity habitats could expand. Lastly from social standpoint, it could contribute to job opportunity, create development distribution, reduce rural poverty, and ensure secured access to management of natural resources, particularly lands. On top of that, their presence could also loosen social tensions and conflicts that are often found in the field.

In addition, efforts will be made to develop palm oil plantation in the future, such as increased production and improved productivity, particularly for community palm oil plantations using superior clones, applying Good Agricultural Practices (GAP) following

sustainable plantation development rules, strengthening smallholder organisations, improving palm oil integration into cattle farming, improving infrastructure supports for palm oil through plantation/access roads to port, and increasing palm oil product value-added by developing domestic industries for cooking oil, bio-fuel, and oleochemical industries. Seeing palm oil plantation potentials and roles in local and national economies, its development will continue, applying sustainable palm oil development principles.

Subsidiary Risk Mapping is a risk analysis method for palm oil plantations using system to score parameters of each indicator for both spatial and non-spatial indicators. Spatial indicators take the form of mapping analysis relating to no deforestation and no peat, Key Biodiversity Area (KBA) analysis, Government-designated protection area analysis, and new concession moratorium analysis. As for non-spatial indicators, they are focused more on analysis of complaints or negative issues concerning the presence of palm oil plantations.

1.2 Objective

Mapping of risks of PT Internusa Jaya Sejahtera's palm oil plantation management aims to:

1. Identify risks of its palm oil plantation management concerning the presence of flora and fauna, peat vulnerability, security of State-protected forests, potential encroachment, and mapping of risks from management of social aspects such as worker and community rights, along with other environmental issues.
2. Plan risk mitigation through a series of appropriate actions relevant to field conditions.

1.3 Scope

The scope includes:

1. Spatial data used is collected from medium resolution data, e.g., TM8 landsat satellite image data, GLAD and Hansen deforestation data, and other supporting data from competent stakeholders.
2. Non-spatial data is collected from online media mentioning the actual posting time.
3. PT Internusa Jaya Sejahtera is yet to independently carry out early detection of deforestation.

2. LITERATURE REVIEW

2.1 Location

Located in Ulilin and Elikobel Subdistricts, Merauke District, South Papua, PT IJS is an Indonesian legal entity running palm oil plantation and processing business with Right to Cultivation (HGU) concession of 8,881.17 ha. The concession is accessible within four hours of driving from Merauke to Ulilin Subdistrict office where some parts of the road are already asphalt.

Table 1. PT IJS Location

No.	Detail	Description
1.	Coordinate	7°00'00"-7°40'00'S 140°20'00"-140°00'00"E
2.	Elevation	0 – 100 m a.s.l.
3.	Local Governments	- Ulilin and Elikobel Subdistricts
		- Merauke District
		- South Papua
4.	Watershed	Kumbe and Merauke Watersheds
5.	Concession Boundaries	
	- North	Water catchment and cultivation zone
	- East	Water catchment
	- South	Water catchment and cultivation zone
	- West	PT Agrinusa Persada Mulia palm oil plantation, water catchment, cultivation zone, and urban area.

2.2. Subsidiary Risk Mapping (SRM)

Subsidiary Risk Mapping is a risk analysis method for palm oil plantations using system to score parameters of each indicator for both spatial and non-spatial indicators. The risk should be mapped to develop mitigation measures to ensure the continued management related to the plantation management and its production, derivative product management, environmental management, and social management.

2.3. SRM Indicator

SRM analysis employs two key indicators, including (1) spatial indicator; and (2) non-spatial indicator, each uses scoring parameter to identify the risk value.

2.3.1. Spatial Indicator

Spatial indicator relates to space or location. It includes spatial parameters in the form of maps concerning areas with deforestation and others with high biodiversity. Score of each parameter is used to identify the risk level/scale (Table 2).

2.3.1.1. Deforestation Parameter

To identify a deforested area, SRM employs the following two approaches.

a) Hansen map, i.e., deforestation maps by Maryland University published by Global Forest Watch (GFW).

b) GLAD, which is GFW map that warns of tree cover loss.

2.3.1.2. Peat Parameter

Parameter of peat, including protection or cultivation peats, uses peat map data from Ministry of Forestry and Environment (MoEF).

2.3.1.3. KBA Parameter

This parameter uses KBA map published by the International Union for Conservation of Nature and Natural Resources (IUCN).

2.3.1.4. Protection Area Parameter

Protection area parameter uses forest and waters map published by MoEF.

2.3.1.5. New concession issuance moratorium parameter

New concession moratorium on primary forests and peatlands, particularly for concessions issued before 17 June 2011, is another parameter used to assess risks based on spatial indicators. This parameter uses Indicative Map of New Concession Issuance Moratorium (PIPPIB) published by MoEF. See table below for risk parameters and scores.

Table 2. Spatial Risk Scale

Spatial Analysis												
Risk Scoring												
Maryland University		GFW Map		KLHK Peat Land Map		IUCN Map		KLHK		KLHK		Min/Max Score
HANSEN		GLAD		PEAT LANDS		Key Biodiversity Area		Legally Protected Area		PIPPIB		
2011-2018		2018-Now		Cultivated/Protected		Elephant, Tiger, Orangutan, Rhino		HL, CA, SA, TN		>17 June 2011		
Criteria	Score	Criteria	Score	Criteria	Score	Criteria	Score	Criteria	Score	Criteria	Score	
No Deforestation	0	No Deforestation	0	No Peat	0	No KBA	0	APL	0	No PIPPIB/Location Permit/IUP <17 June 2011	0	0
Deforestation	1	Deforestation	1	Cultivated Peat	1	Found 1 species	1	HP,HPK,HPT	1	Undeveloped PIPPIB areas	1	6
				Protected Peat	2	Found >1 species	2	HL,TN,CA	2	Developed PIPPIB areas	2	10

2.3.2. Non-Spatial Indicator

Non-spatial indicator is concerned with description regarding legal, community, worker, environment, and liability- recovery complaints and negative issues received by the company through print, electronic, and social media. Non-spatial risks are not concerned with spatial perspective; but rather, it highlights companies from number of negative issues and complaints they received. The more negative issues, the more their images deteriorate in the eyes of palm oil industry. Each parameter has a score used to specify the risk level/scale. See Table 3 for risk scores/scales.

Table 3. Non-Spatial Risk Scale

Quantity of Negative Media Monitoring & Grievance List					Min/Max Skor
Legal	Community	Labor	Enviroment	Liability-Recovery	
0	0	0	0	0	0
1	1	1	1	1	5
2	2	2	2	2	10

0 - No negative issues or complaints

1 - There are 1-2 nega

2 - There are 2 or more negative issues or complaints under each category

Scale of Score:

0-3 Low Risk
4-6 Medium Risk
7-10 High Risk

3. METHODOLOGY

3.1. Data

Data used in this research includes:

1. MoEF's 2020 land cover data
2. TM 8 image downloaded from USGS.Gov
3. Papua's PIPPIB, peat, and forest and waters data published by MoEF
4. Downloaded IUCN KBA Data
5. GLAD and Hansen data downloaded from GFW
6. Ministry of Agriculture's peat data
7. Negative issues and complaints data downloaded from various online sources

3.2. Implementation of Spatial Indicators

In general, this research includes four stages as follows.

1. Download spatial data relating to risk mapping as a baseline in processing risk maps. Visit *https://earthenginepartners.appspot.com/science-2013-global-forest* to download example of deforestation-related spatial data.
2. Overlay spatial data over PT IJS HGU boundary data to produce outputs, such as areas with deforestation risks, peat, KBA, PIPPIB, and forest area function.
3. For spatial indicators with areas indicated to have potential risks, each parameter's scoring analysis is as follows.
    a. Deforestation. Score (0) if no deforestation was carried out in 2018-2022. Score (1) if deforestation was carried out in 2016-2022.
    b. Peat. Score (0) if HGU concession is not located on peat. Score (1) if HGU concession is located on cultivation peat. Score (2) if HGU concession is located on protection peat.
    c. KBA. Score (0) if HGU concession is not located in KBA. Score (1) if HGU concession is located in KBA and one key species is found. Score (2) if HGU concession is located in KBA and two or more key species are found.
    d. Area Function. Score (0) if HGU concession is located in a Non-Forestry Zone. Score (1) if HGU concession is located in Production Forest, Limited Production Forest, and Convertible Production Forest. Score (2) if HGU concession is located in protection areas (Protection Forest, Nature Reserve-Nature Conservation Areas).

e. PIPPIB. Score (0) if IUP concession was issued before 17 June 2011. Score (1) if HGU concession is located in PIPPIB area, but no lands have been cleared for palm oil. Score (2) if HGU concession is located in PIPPIB area and lands have been cleared for palm oil.

4. The following is risk level classification based on total scores per parameter.
   a. 0-3, Low Risk
   b. 4-6, Medium Risk
   c. 7-10, High Risk

3.3. Implementation of Non-Spatial Indicators

1. Online search for negative issues and complaints related to PT IJS
2. Classify negative issues and complaints by parameter
3. Each parameter is scored following evidence found online, with details as follows.
   a. Score 0 if there are no negative issues/complaints
   b. Score 1 if there are 1-2 negative issues/complaints under each parameter
   c. Score 2 if there are 2 or more negative issues/complaints under each parameter
   d. Particularly for liability, score 2 if the concession is larger than 3,000 ha
4. The following is risk level classification based on the total scores per parameter
   a. 0-3, Low Risk
   b. 4-6, Medium Risk
   c. 7-10, High Risk

4. OUTPUT AND ELABORATION

4.1 Risk analysis output by spatial indicator

Table 4. Risk Scale Scoring

No.	HGU Name	Hansen	GLAD	Peat	Key Biodiversity Area	Protection Area	PIPPIB Map	Total	Risk Scale
1	PT Internusa Jaya Sejahtera	1	1	0	1	0	0	3	Low

4 indicates the output of risk scoring by spatial indicator. Using Hansen and GLAD approaches, PT IJS is identified to have carried out deforestation, while map of forest and waters function indicates that its concession is located in Non-Forestry Zone (APL). The concession is also indicated to be situated in a KBA. The HGU concession is not located on peatland or PIPPIB zone. Spatial indicator total scoring indicates that the company scored 3, hence low risk for environmental damage. Unless they apply sustainable palm oil management, the environmental damage rate would accelerate.

4.2 Spatial Analysis of Deforestation Parameter

Concerning deforestation parameter, risk analysis uses two analysis bases, i.e., Hansen Map and GLAD Map analyses.

4.1.1. Hansen Map Analysis

Table 5. Size of 2016-2018 Deforestation Area according to Hansen Map

2016-2018 Deforestation (Hansen)					
Company	Total area of company concession (ha)	Year			Total (Ha)
		2016	2017	2018	
PT Internusa Jaya Sejahtera	8,881.17	1,480.135	1,682.272	1,682.745	4,845.151

Table 5 shows that PT IJS concession faced deforestation in 2016-2018 with total area of 4,845.151 ha. Figure 1 shows the location of the 2016-2018 deforestation indicated on Hansen map. Based on Hansen Map deforestation indicators, it is known that the company scores 1 as deforestation is found in its HGU concession.

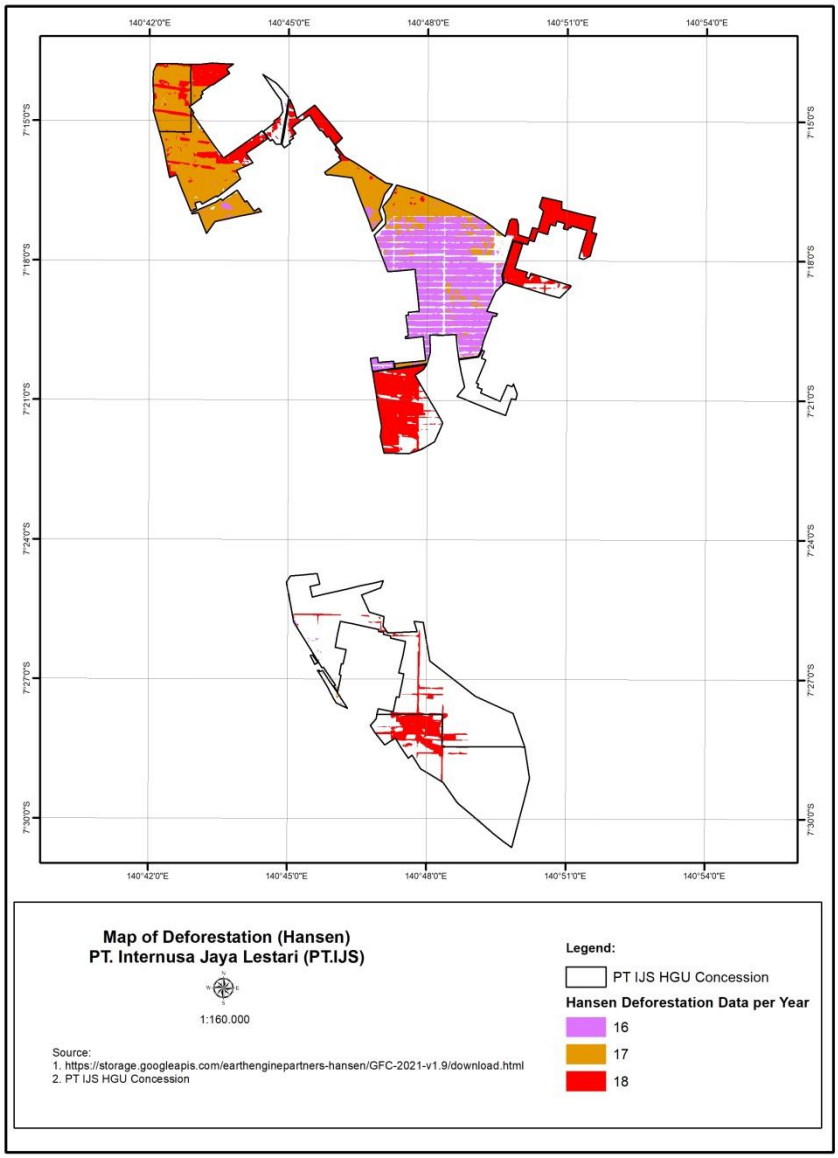

Figure 1

4.1.2. GLAD Analysis (2019-2020 Clearing)

Table 6. Size of Deforestation Area according to GLAD Map

2019-2022 Deforestation (GLAD)						
Company	**Total area of company concession (ha)**	**Year**				**Total (Ha)**
		2019	**2020**	**2021**	**2022**	
PT Internusa Jaya Sejahtera	8,881.17	2,302.650	856.236	3.425	0.5	3,162,811

Table 6 shows the output of 2019-2022 deforestation area identification using GLAD approach. The table indicates that in PT IJS concession, a massive land clearing was carried out in 2019 (covering an area of 2,302.65 ha) but decreased in the following years. In 2022, deforestation consumed only 0.5 ha. Figure 2 shows location of deforestation indicated by GLAD approach. Based on GLAD map deforestation indicator, it is known that the company scores 1 as deforestation is found in its concession.

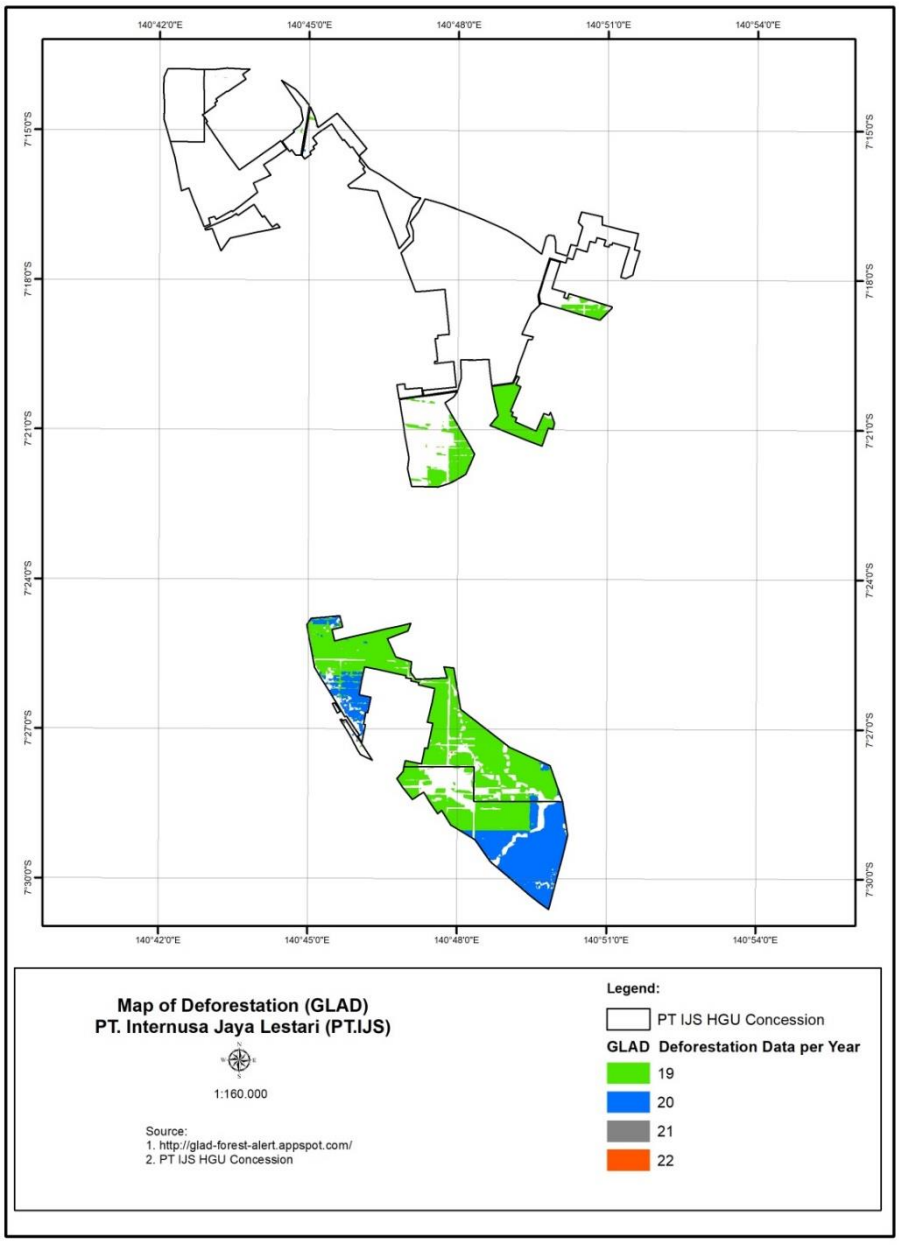

Figure 2

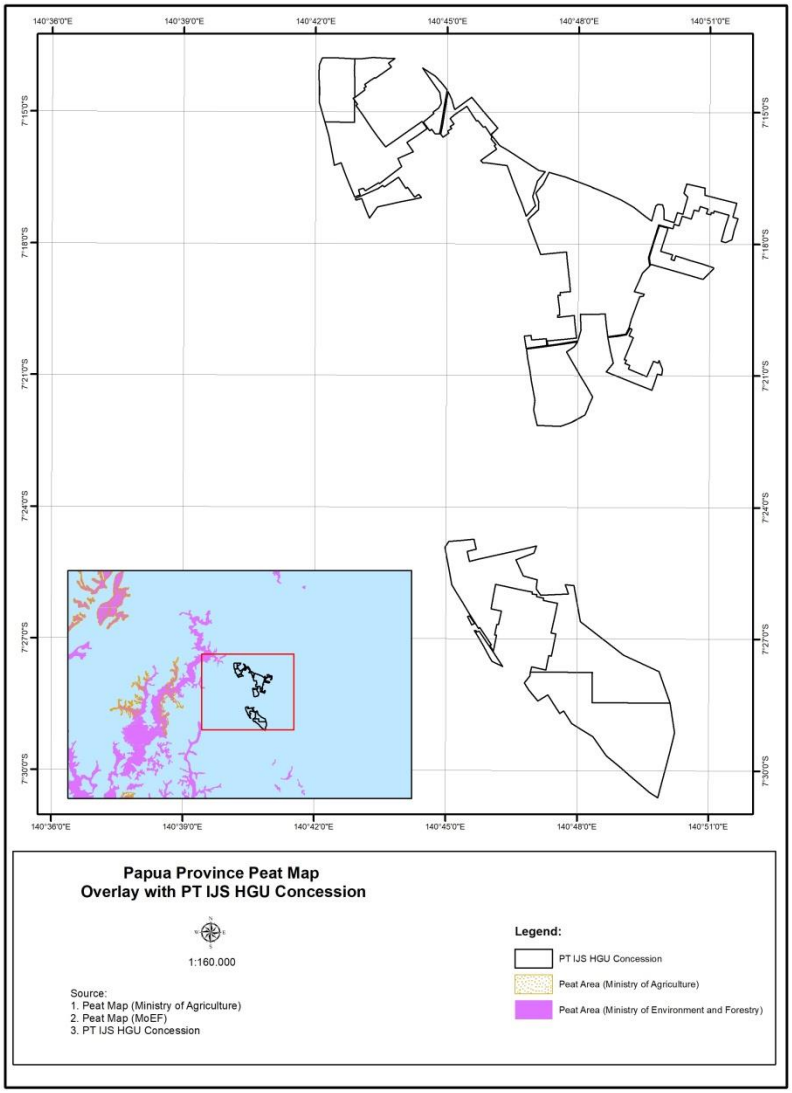

Figure 3

4.1.3. Spatial Analysis of Peatland Parameter

Table 7. Land Clearing on Peat

Cultivation Peat (ha)				
Company	**Total area of company concession (ha)**	**Non-peat (0)**	**Cultivation Peat (1)**	**Protection Peat (2)**
PT Internusa Jaya Sejahtera	8,881.17	-	-	-

Based on Map of Peat Area issued by Ministry of Agriculture and MoEF, it is known that PT IJS concession is not located on peat, scoring 0 for peat parameter risk scale (Table 7). Figure 3 shows peat map overlaid with PT IJS concession.

4.1.4. Spatial Analysis of KBA Parameter

Table 8. Size of Land Clearing in KBA

Key Biodiversity Area (ha)				
Company	**Total area of company concession (ha)**	**Non-KBA (0)**	**1 species (1)**	**>1 Species (2)**
PT Internusa Jaya Sejahtera	8,881.17	-	428.10	-

Based on IUCN KBA Map, out of the total 8,881.17 ha of the company's concession, 428.10 ha is located in Upper Kumbe KBA with only one key species (Table 8). See Figure 4 for Map of KBA around the concession. In conclusion, PT IJS scores 1 as its concession is located in Upper Kumbe KBA.

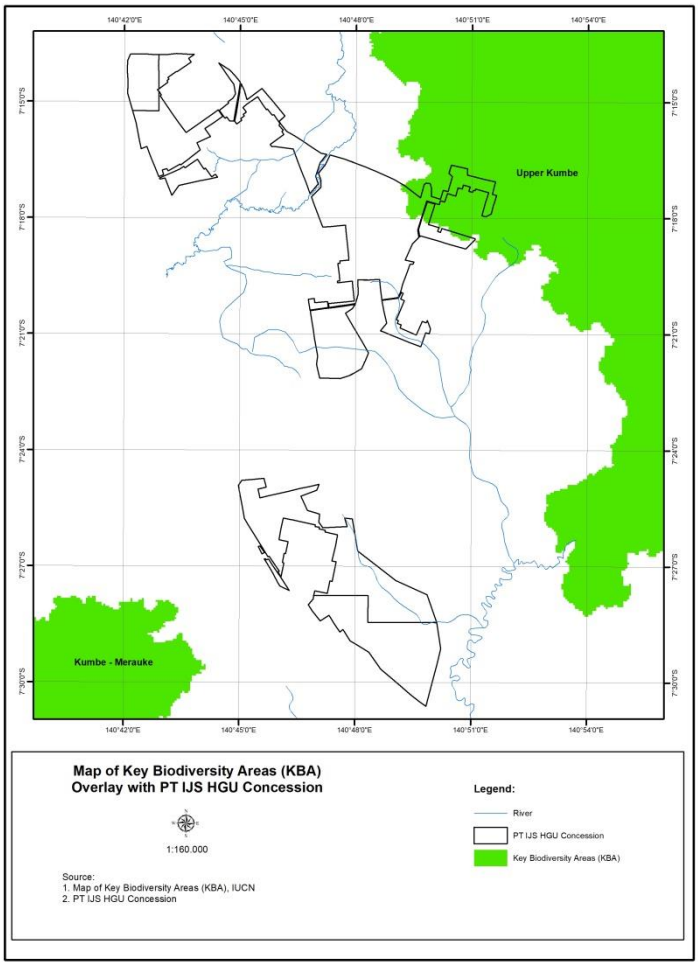

Figure 4

4.1.5. Spatial analysis – Protection Area

Table 9. Size of Areas with Overlapping Functions

Company	Total area of the company concession (ha)	Area Function							Total Area (ha)
		Non-forestry Zone	Production Forest	Convertible Production Forest	Limited Production Forest	Protection Forest	National Park	Nature Reserve	
PT Internusa Jaya Sejahtera	8,881.17	8,881.17	-	-	-	-	-	-	8,881.17

Based on overlay between map of Papua forest and waters published by MoEF in 2012 and the company's concession, it is known that the entire concession is located in non-forestry zone (APL) (Table 9). Figure 5 indicates that the concession is located outside the areas of Papua Forest and Water area function. As such, concerning Protection Area parameter, PT IJS scores 0 because its area is located in non-forestry zone.

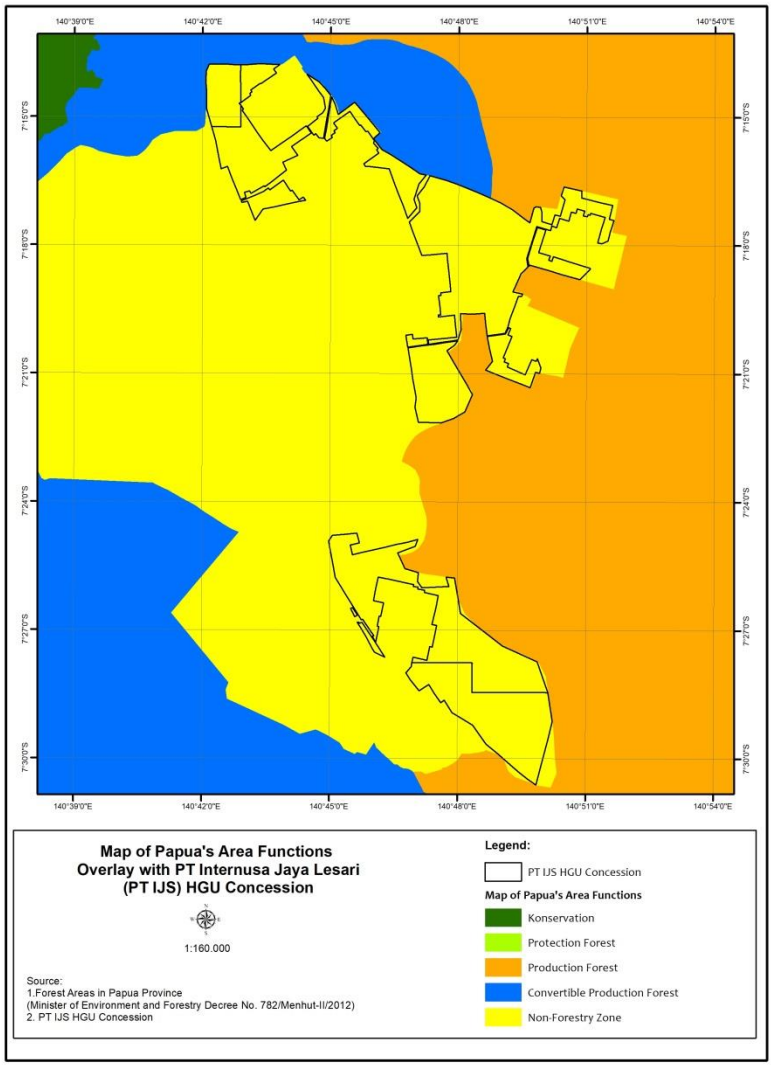

Figure 5

4.1.6. Spatial Analysis – Indicative Map of New Concession Issuance Moratorium (PIPPIB)

Table 10. Land Clearing in PIPPIB Zone

Size of PIPPIB Zone (ha)				
Company	**Company total concession area (ha)**	**Non-PIPPIB/Concession/IUP <17 June 2011 (0)**	**Non-Cleared PIPPIB Area (1)**	**Cleared PIPPIB Area (2)**
PT Internusa Jaya Sejahtera	8,881.17	-	-	-

Based on the PIPPIB map issued by MoEF and data in Table 10, PT IJS has not cleared and planted in PIPPIB zone. Therefore, the company has a risk scale of 0 for PIPPIB parameter. Figure 6 indicates the overlay of PT IJS concession with PIPPIB map.

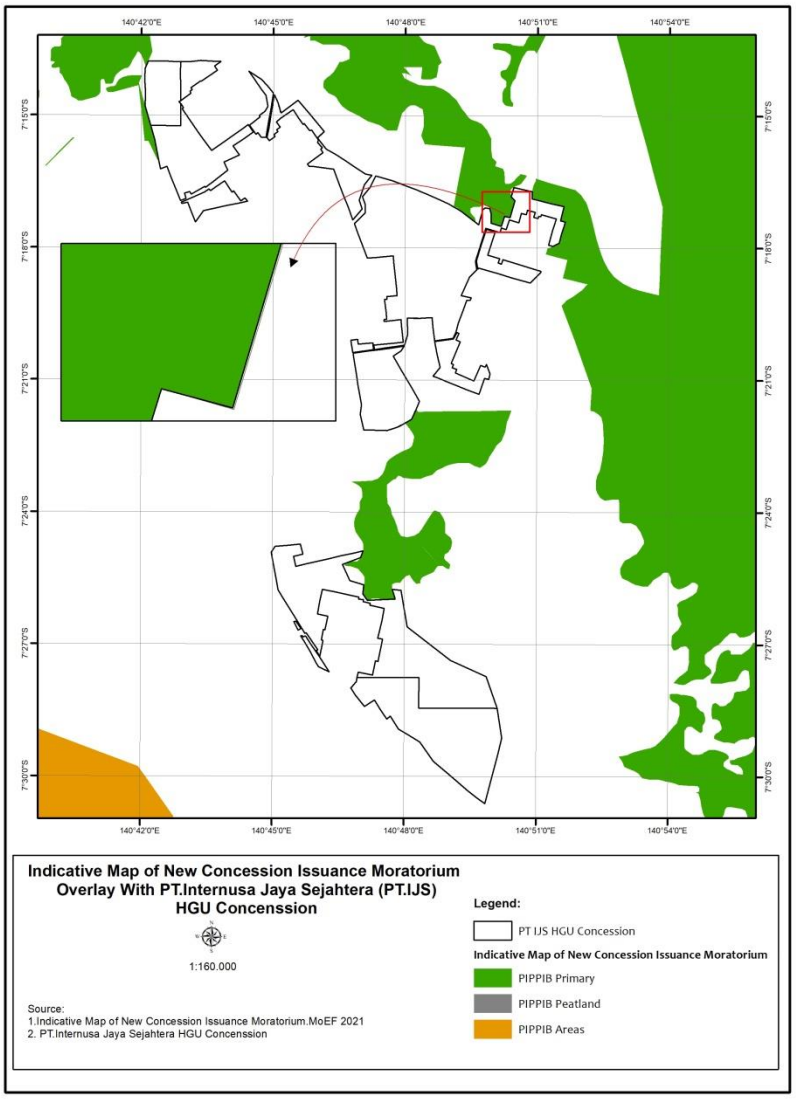

Figure 6

4.3 Risk Analysis based on Non-spatial Indicator

Table 11. Risk Scale Scoring

No.	Mill Name	Group/Parent Company	Non-Spatial Analysis													
			Legal	Score	Community	Score	Worker	Score	Environment	Score	Liability	Score	Recovery	Score	Total	Description
1.	PT. Internusa Jaya Sejahtera	Indonusa Group		0	1. https://mongabay.co.id/2017/11/30/polemik-tanah-marga-di-kampung-bupul-saat-hutan-berubah-jadi-kebun-sawit/ 2. https://landmatrix.org/media/uploads/oil-palm-company-is-destrying-the-fraternal-links-within-communities-around-muting-and-bupul.pdf	1		0	1. https://www.mightyearth.org/wp-content/uploads/Rapid-Response-Report-7-August-2018.pdf 2. https://www.mightyearth.org/wp-content/uploads/Rapid-Response-Report-10-copy.pdf 3. https://www.mightyearth.org/wp-content/uploads/Rapid-Response-Report-11-copy.pdf 4. https://www.mightyearth.org/wp-content/uploads/Rapid-Response-Report-12.pdf 5. https://www.teras.id/news/pat-20/294813/yayasan-pusaka-temukan-42-kasus-pelanggaran-ham-di-papua-sepanjang-2020 6. https://chainreactionresearch.com/wp-content/uploads/2020/02/Pelanggar-yang-Sama-Terus-Melakukan-Pembukaan-Hutan-untuk-Kelapa-Sawit-di-Asia-Tenggara.pdf	2		0		0	3	Low Risk

Table 11 indicates the risk scoring by non-spatial indicators. Indicators assessed include legal, community, worker, environment, liability, and recovery aspects. The assessment includes finding negative issues/grievances of each aspect in various media, particularly online media. Scoring is done from 0-2 depending on number of negative issues found. The assessment found negative issues. Upon calculating all aspects in total, PT IJS scores 3 (low risk).

Score 1 is given when 1-2 negative issues are found in mass media concerning community aspect and score 2 is when there are more than 2 negative issues in mass media.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

1. PT IJS scores 3 for risks under spatial indicator (low risk)
2. PT IJS HGU concession is not located in peat area
3. PT IJS HGU concession is located in a Non-Forestry Zone (APL)
4. PT IJS HGU concession is not located in PIPPIB zone
5. Based on Hansen map analysis, the largest deforestation was carried out in 2019 (2,302.650 ha)
6. PT IJS HGU concession belongs to Upper Kumbe KBA
7. PT IJS scores 3 for risks under non-spatial indicator (medium risk)
8. Negative issues are found concerning community and environment aspects

5.2 Recommendation

1. PT IJS should conduct monitoring and management of Upper Kumbe KBA.
2. PT IJS should handle negative issues and grievances by setting up hotline to immediately respond grievances from both local community and its workers.
3. PT IJS should conduct a liability assessment to see more detailed intensity of deforestation that it carried out in 2016-2022.