



Assessing the Development Impact of the Sota Border Post Connecting Indonesia and Papua New Guinea

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ABSTRACT

Although some studies have mentioned land use and land cover across the borderlands of New Guinea, there have not yet been a series of systematic studies that link the topic with the construction of the Sota border post (*Pos Lintas Batas Negara*—“PLBN Sota”). With reference to realism, liberalism and asymmetrical power relations, this study examines the development impacts of the Sota border post. A set of interdisciplinary mixed-methods approaches are used including geospatial and earth observation analysis, collation of bureau of statistics data as well as academic and grey literature review. Results provide a baseline land cover assessment for the study area surrounding the Sota border post. There have also been a range of socio-economic and biophysical impacts of the infrastructural and immigration capacities along the Southern borderlands of New Guinea. In terms of international relations, the presence of the Sota border post is expected to foster cooperation between Indonesia and PNG, decrease conflict, and promote stability in the border area. As a result, both realism and liberalism can be used as theoretical frameworks to understand the trajectory of developments along the borderlands. However, due to the asymmetries of power, the rhetoric of liberalism



may be rendered less convincing.

KEYWORDS:

Asymmetries of Power; Indonesia and PNG; International Relations; Land Use and Land Cover; Sota Border Post

INTRODUCTION

The 750 km border between Indonesia and Papua New Guinea (PNG) plays a pivotal role in connecting Asia and the Pacific (Heathcote, 2021). Most of the Indonesia-PNG border area ranging from the North to the South is still covered with forest undisturbed by humans, making it challenging to traverse, monitor and regulate. Both halves of the island of New Guinea have a number of shared Land Use and Land Cover (LULC) characteristics (Letsoin et al., 2020; Hoover, 2017a). These include both socio-economic and biophysical LULC dynamics. In terms of the socio-economic, the communities on both sides have a number of shared historic, social and cultural land use practices. In terms of the biophysics, New Guinea has a unique richness of biodiversity, vegetation, elevation ranges, soil types, geologies, and climates (Britannica, 2019; Hoover, 2017b; Marshall & Beehler, 2007). For example, Papua has 657 species of birds while the wider New Guinea Region has 831 species of birds making up 6.8% and 8.6% of the world's total birds or avifauna, respectively (Mack & Dumbacher, 2007). In order to monitor the environmental

conditions along the borderlands, an understanding of land use and land cover change is essential.

In relation to governance of the borderlands, the governments at both sides of the border have agreed to improve security and regulate traditional border crossings. These agreements are laid down in the Basic Agreement Between the Government of the Republic of Indonesia and the Independent State of Papua New Guinea on Border Arrangements signed in 1979 (Mangku, 2018). In line with this agreement, the government of Indonesia considers it vital to build transnational border posts along the border with PNG. The first one is the border post (*Pos Lintas Batas Negara*—“PLBN”) in the north, at Skouw in 2017 (Somba, 2017; Korwa & Rumabar, 2017). The border post at Sota is the second one (Piri, 2021).¹ Indonesia commissioned these border posts to improve the monitoring and regulation of cross-border movements between Indonesia and PNG. The growing amount of literature on this international borderland has revealed

¹ Currently, the Indonesian government is also completing the construction of the Yetetkun Border Post (PLBN) in Boven Digoel Regency, Papua Province.

data on land use and land cover in Indonesia and PNG in general (Letsoin et al., 2020; see also Juniyaniti et al., 2020; Samanta, 2016; Hoover, 2017a). However, no systematic study that connects the land use with the construction of border posts has been conducted, including the Sota border post. This study aims to fill gap and seeks to: (1) provide a baseline assessment of land cover assessment of the areas of the Sota border post; (2) shed light on past, present and future socio-economic and political dynamics; and (3) explain the implications of the Sota border post for the international relations between Indonesia and PNG.

This study is critical because it informs policy and programs in this dynamic region of Southern New Guinea. The study seeks to address the following three questions: what are the key development impacts of the Sota border post? What are the land-cover conditions on either side of the border adjacent to the Sota border post? How can the development of the border post be explained through realism, liberalism or asymmetries of power?

The article is structured as follows. It first reviews the relevant literature to provide a description and evaluate the extant literature and areas that have not yet been explored. Next, as part of a mixed methods approach, the study details the theoretical frameworks used to analyse the context of this border development from an international relations perspective. This is followed by a description of the methods used in the

quantitative remote sensing analysis component of the study. The subsequent section presents the results, including the outcome of the remote sensing and geospatial assessment of land cover in Merauke and Morehead. The discussion section encompasses the impacts of the development of the Sota border post, future foundations for Indonesian border management policy, and the possible implications for international relations and security from realism, liberalism and asymmetries of power.

LITERATURE REVIEW

The literature that covers the various dimensions of the border splitting the island of New Guinea in two is limited. There are a number of papers that focus on international relations and security implications of this borderland (Blaskett, 1989; Teturan et al., 2019; Mite et al., 2020), welfare outcomes along the borderland (Mangku, 2021), and notably one paper which focuses on the geospatial planning of a border post and its surrounding area (Latif & Augustan, 2017). In the wider conceptual literature outside of the context of the Merauke-Morehead border, there are studies that shed light on areas of environmental governance along borderlands (Munoz-Melendez & Martinez-Pellegrini, 2022). A number of papers have been written about the asymmetric power relations in border governance between a nation state with more power: (economic or military) at the border than the other nation state (Munoz-Melendez & Martinez-Pellegrini,

2022; Apanisile & Oloba, 2020). While Mite et al. (2020) explore the asymmetries of power in Indonesia's international relations, the extent to which this is demonstrated at the Indonesia and PNG border is yet to be investigated in greater depth.

In the context of the Indonesia and PNG border, power asymmetries among the two countries are apparent in the literature. Pfetsch (2011) defines *asymmetry* as a structure one can find in most social and political relations and in relations between unequal parties. In this regard, Indonesia can be categorised as the nation state with greater 'hard power' (military resources) and stronger economic resources in its position on the border (Mangku, 2021). In contrast, PNG is categorised as 'subordinate' in terms of both power, economic resources, and infrastructure adjacent to the border (Tapari & Burton, 1995). The Indonesian government strongly emphasises political security and is concerned with the rhetoric of economic development on welfare for borderland communities (Mangku, 2021). In contrast, the PNG government has relatively limited resources and outreach for these remote areas (Tapari & Burton, 1995). For example, Indonesia established the Sota border post and market and even allowed PNG citizens living in border areas to check their health at TNI health officers in Sota District, and the Sota District Health Centre. This trend has been occurring largely due to inadequate health facilities and services in the Morehead and Western Province of PNG.

As a result, more and more people have decided to come for medical treatment in Merauke (Nugroho, 2016; Hapsari, 2020). Power asymmetries between Indonesia and PNG are most likely influenced by economic conditions, security policies and military power. Firstly, according to the Observatory of Economic Complexity, in 2020, Indonesia's economy was ranked 64 in the Economic Complexity Index (ECI -0.093), and 28 in total exports (\$178B). In the same year, Papua New Guinea was ranked 127 in the Economic Complexity Index (ECI -1.8), and 90 in total exports (\$9.34B). In more common macroeconomic terms, Indonesia's GDP and GDP per capita are \$1,186,067M USD per annum and \$4,357 USD per capita/annum, respectively (Country Economy, 2021). In PNG, we see a GDP of \$26,594USD and a GDP per capita of \$2916USD (Country Economy, 2021). Indonesia's economic growth has been recognised in international relations as the country has been inducted as one of the G20 members. It implies Indonesia has sufficient funding for border development. Secondly, Indonesia's policies related to border development also continue to develop from time to time, even forming a particular agency for the border in 2010, well-known as the National Border Management Agency (*Badan Nasional Pengelolaan Perbatasan*—"BNPP"). Finally, national security and economic policy also play a vital role in determining the distribution of power. Indeed, the current President of Indonesia, Jokowi, desires to

advance a border area and the border market as the centre of economic growth (Mandibondibo et al., 2022).

It has been claimed that the Indonesian government is seeking to implement approaches to improved welfare along the borderlands (Mangku, 2021; Teturan et al., 2019). Yet, some scholars have a different opinion. Norotouw (2017), for instance, argues that the security approach will remain at the forefront of bilateral relations between Indonesia and PNG. The argument for this revolves around the issue of Papuan separatism which is forecast to continue to affect Indonesia and PNG ties into the foreseeable future. While it is true that border policies are designed to obtain certain state objectives, there may also be intersections with local values surrounding the different positions around the separatism movement. This may include Indigenous Melanesian cultural ties between Merauke and wider Papua with Morehead and wider PNG. While outside of the scope of this research, studies of these cultural ties have included shared genealogies (Burton, 2007), border relations around issues of asylum seekers between West Papua and Papua New Guinea (Glazebrook, 2008) as well as shared cultural identities and ontologies (Goldman & Ballard, 1998). This would constitute an important cultural consideration that may influence border policies. In any case, Norotouw (2017) recommends that the formulations of border policies should focus on building trust between the two countries

to minimise misunderstandings. With this in mind, national interests will likely supersede any local level cultural considerations.

Pugu (2020) also affirms that Indonesia's border policy approach toward PNG focuses less on socio-cultural aspects and more on state security. Both countries attempt to overcome such threats as 'illegal' border crossers, weapons and drugs smuggling, human trafficking, and illegal logging. Pugu (2020) underlines that globalisation has far-reaching implications by transforming the national territory into a borderless environment. In her study, Pugu (2020) examines illegal small arms trafficking in Papua and how it exacerbates human security and contributes to the protracted conflict in Papua. She identifies at least three factors that contribute to such trafficking: marijuana trafficking, cross-border ethnic and economic relations; and the natural environment of the border, which is mainly covered by dense forest. Monitoring the dense forests, woodlands and swamplands and land cover changes over time as attempted in this study, may shed light on the role of the natural environment in the potential for migration and trade, both legal and illegal.

During the Covid-19 pandemic, Korwa and Sinaga (2021) examined the policy approach at the Indonesia-PNG border as a deterrence measure. Their assessment shows how the two countries can use border policies to better regulate human migration and prevent the spread of viruses such as Covid-19. It is essential

to ensure human security in both countries, especially in PNG as it has limited health infrastructure in the remote regions of the borderland. The two countries agreed to close border gates in January 2020 and tighten security along the border. Nevertheless, the repatriation process for citizens of both countries was still being carried out amid the Covid-19 pandemic through the PLBN (Cross-Border Post) in Skouw, Jayapura. This PLBN is a place for document inspections of border-crossers, including immigration, customs, quarantine, security, and others.

Maryen et al. (2021), add another variable to the Indonesia-PNG border management. Regardless of welfare, security, and environment approaches, Maryen et al. (2021) look at a cultural approach with the involvement of indigenous Papuan women in accessing border markets. In this context, indigenous people are expected to play a more significant role than non-indigenous people in selling their commodities. Maryen et al. (2021) contend that this will help improve the well-being of border communities and Indigenous Papuans.

Overall, the literature review shows that there are relatively few studies that have compared conditions across the border in the Merauke and Morehead regions. Furthermore, we have no studies on the LULC dynamics in Southern New Guinea. This study seeks to provide a baseline to shed some light on these LULC dynamics as well as the implications for Merauke and Morehead at the local subnational level and the national levels.

This is a preliminary exploration that focuses on Merauke in West Papua. Future studies should cover both sides of the border.

THEORETICAL FRAMEWORK

This section outlines in greater detail, the theoretical approaches used to analyse the context of the study area. These include realism, liberalism, and asymmetries of power. Realism is a school of thought considered to have a dominant influence in the discipline of International Relations (IR), mainly focusing on competition and conflict (Antunes & Camisao, 2017). Realist theory has several assumptions. First, this theory assumes that the nation-state (usually abbreviated as *state*) is the leading actor in international relations. Despite acknowledging the existence of non-state actors in the global system, realist proponents believe they are not as crucial as states. Second, states interact in a circumstance called *anarchy* – the world lacks any supreme authority nor any hierarchically superior power capable of overcoming matters in the international system. Third, realist thinkers view the states as rational actors in making decisions, carefully calculating the costs and benefits of actions they take to pursue the national interest. The concept of national interest plays a pivotal role in realism, in which security is considered the primary goal (Donnelly, 2005; Elman, 2007; Humphreys, 2015). In short, realism adopts a pessimistic view of human nature.

Liberalism, in contrast to realism,

provides a more optimistic worldview, emphasising the likelihood of peace and cooperation. To some extent, liberalism is strongly linked to individual liberties and free markets (Burchill, 2005; Meiser, 2017). Jorgensen (2010) contends that the liberal school of thought can be identified by several characteristics. First, liberal thinkers have strong faith in human reason. In this sense, they believe humans are rational actors, making them capable of shaping their destiny in international relations. Second, liberal theorists argue that there is a nexus between domestic and international politics and should not be separated from each other. Third, liberal proponents argue that the more the states depend on each other economically, the less conflict and war would appear among them. Last but not least, liberal supporters contend that institutionalising international relations would positively impact the world, including the United Nations.

Meanwhile, Womack (2006) defines asymmetry theory as a new paradigm that deals with the ramifications of national disparities on international relations. Despite creating differences in interactive behaviour between states, asymmetry makes the international order relatively stable. In this regard, asymmetry power uses multipolarity to critique unipolarity, which overestimates the prevalence of absolute power. Majeski (2004) also believes that the difference in power among nation-states has become an

increasingly poignant area for international relations scholars because asymmetries are mainstream in the international system. Majeski (2004) found that survival and cooperation would increase despite endowing agents with various forms of asymmetric power. In short, this indicates that the asymmetry of power in international relations creates positive results. Next, this article will describe the research method used in this study.

METHODS

Study area

Through a thorough review of data held at the Bureau of Statistics, this study is able to shed light on a profile of Merauke Regency (BPS, 2021). As shown in figure 1, Merauke is located at the easternmost boundary of Indonesia as well as in the southernmost part of Papua Province: 5° - 9° south latitude and 137° - 141 East longitude (BPS, 2021). In the East, it is directly adjacent to the nation-state of Papua New Guinea. In terms of topography, Merauke Regency is a lowland area with altitudes ranging from 0-60 metres above sea level (BPS, 2021). It comprises the largest area of all regencies in Papua Province (BPS, 2021). The area of Merauke Regency is 46,791.63 km² (BPS, 2021). In 2021, Merauke's total population included 230,932 inhabitants (BPS, 2021). Because censuses in this remote are hard to undertake, this number is not very reliable.

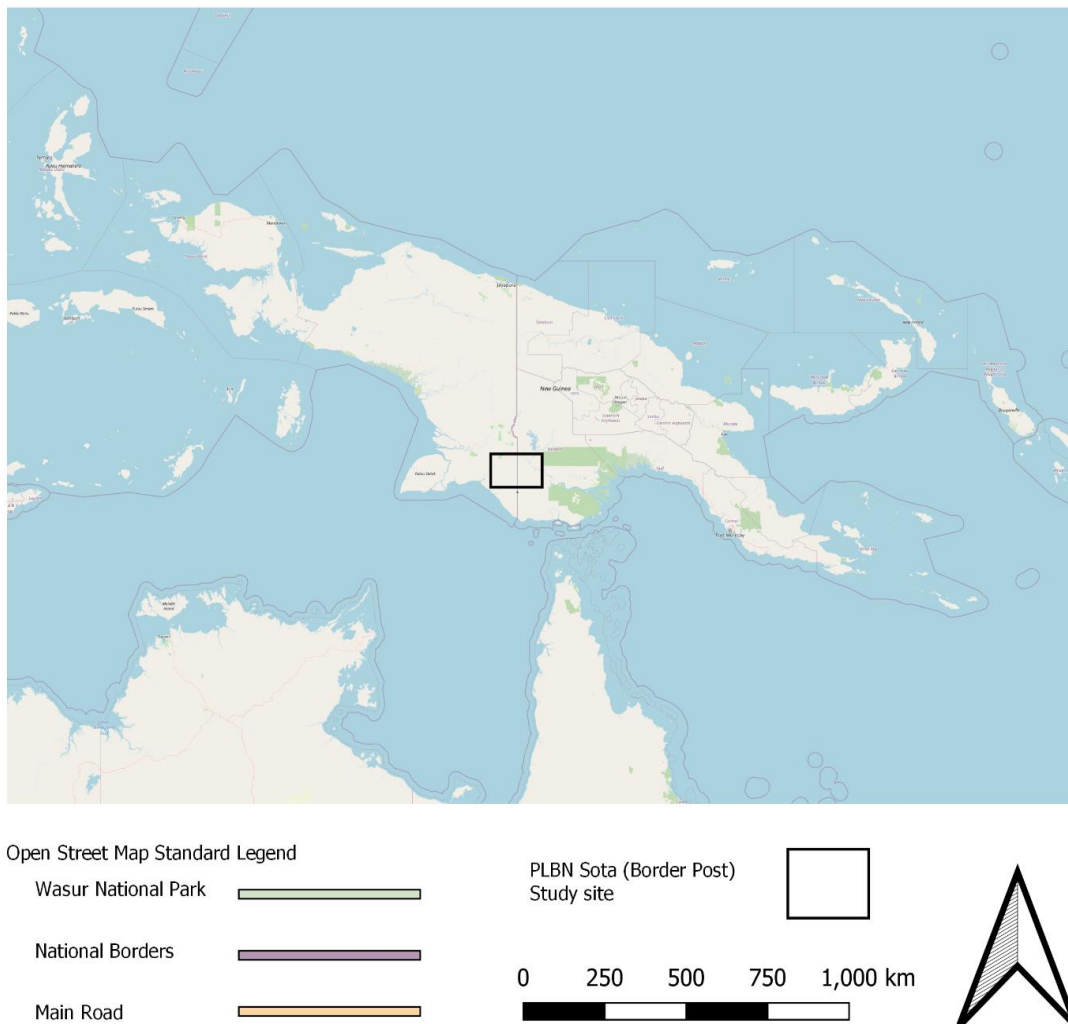


Figure 1. Location of the transnational border study site within the Asia-Pacific region highlighted in the central bounding box in the Southern Provinces of New Guinea.

Source: drafted by authors using Quantum GIS and the Open Street Map basemap (2022)

Both the Morehead district and the Merauke Regency have a tropical climate with an average air humidity of 80.5% (BPS, 2021). The average temperature in the Merauke Regency is 27.91°C with temperatures ranging from 20.30°C to 36 20.30°C (BPS, 2021). Through ongoing decentralisation of state power since 2000, Merauke Regency now has 20 districts, 11 sub-districts, and 179 villages (BPS, 2021). In 2020, Merauke Regency consisted of 20

districts, 11 sub-districts, and 179 villages. The latest regional expansion took place in 2018 (BPS, 2021). The number of Civil Servants in Merauke Regency in 2019 reached 7,795 employees (BPS, 2021). Located in the Merauke Regency, the Sota District is directly adjacent to PNG. According to BPS, the district of Sota has 3,461 inhabitants (2021). To the North, Sota is bordered by Elikobel District, to the East by PNG and to the South and

West by Merauke Regency, Tanah Miring District and Jagebob District. Sota District includes an area of 2,319,071 km² (5.06% of the total area of Merauke Regency (BPS, 2021). Sota is 80.00 km from Merauke Regency and can be reached in 1-2 hours drive. Sota is surrounded by the Wasur National Park (Latif & Agustan, 2018).

The Merauke Regency is adjacent to the Morehead district in PNG, located in The Western Province of PNG. Morehead district has 18 villages. There are eight villages near the Bensbach River (Wereave, Weam, Korombo, Bensbach, Torwaia, Wando, Balamuk, and Bandber), two villages near the coast (Bula and Tais), and eight villages in the north region (Indorodoro, Kandarisa, Tokwa, Mengete, Yokwa, Rouku, Wemenevre, and Mibini) (Suligoj et al., 2005). In the final figures of the 2011 census in PNG, 2,802 households with 16,133 persons were recorded for the Morehead District, consisting of 8,314 males and 7,819 females (BPS, 2021). The 2011 figure is higher compared to the previous census in 2000, where only 2,104 households with 11,504 persons (5,746 males and 5,758 females) were recorded in the Morehead district (National Statistics Office 2011 Census results, 2013). Due to the remoteness of the region these census data are not reliable and should be taken as estimates.

Methods of data collection

This study used a mixed methods approach that combines both quantitative and qualitative datasets. In doing so, the study integrates five methods: (1) review

of grey literature; (2) academic literature review; (3) review of Central Bureau of Statistics data sets; (4) GIS (Geographic Information System) analyses; and (5) remote sensing data analyses. The remote sensing methods required five steps: 1) Sentinel 10 m resolution surface reflectance imagery in Google Earth Engine was downloaded for the study site; 2) this imagery was reduced to a geo-median for 2020; 3) clouds were reduced with a mask; 4) supervised classification of six classes including urban, agriculture, woodlands, forest, bare lands, and surface water; 5) division of the study site into Merauke, Papua and Wereave Village and Morehead District, Western Province subsample areas; and 6) statistics generated for each of these sites.

In terms of the biophysical implications of the Sota border post, these were explored through a land cover assessment. The importance of measuring land cover change is that it provides a baseline and benchmarks for monitoring future changes over time. This in turn allows for measurements of rates of change to highlight areas that need to be monitored more closely or need to be closed off and preserved. A clear example of this is the Wasur National Park in Papua Province (Cochrane, 2006). It is important that these areas remain fenced off to prevent logging, mining, agriculture, and other unregulated land uses that often lead to ecological degradation. The ability to maintain these landscapes within certain thresholds of ecological status is only possible if we

measure the extent of environmental degradation in the areas of these habitats over time. Towards that aim, the baseline provides the first step of a biophysical impact assessment.

RESULTS AND DISCUSSION

The results of the geospatial assessment of Merauke and Morehead

The results of the geospatial assessment quantify areas of the security facilities and nearby settlements shown in figures 2. As

shown in figure 3, the security facilities and border post itself comprises a fenced area of approximately 1.21 km of perimeter enclosing an area of approximately 5.48 hectares or 0.0548 km². There is an area of settlements and agriculture next to the border post and that makes up the township of Sota sub-district. This includes an area of approximately 4.1 km². The main roads connecting to this township head West to Merauke and North to Sawaoe.

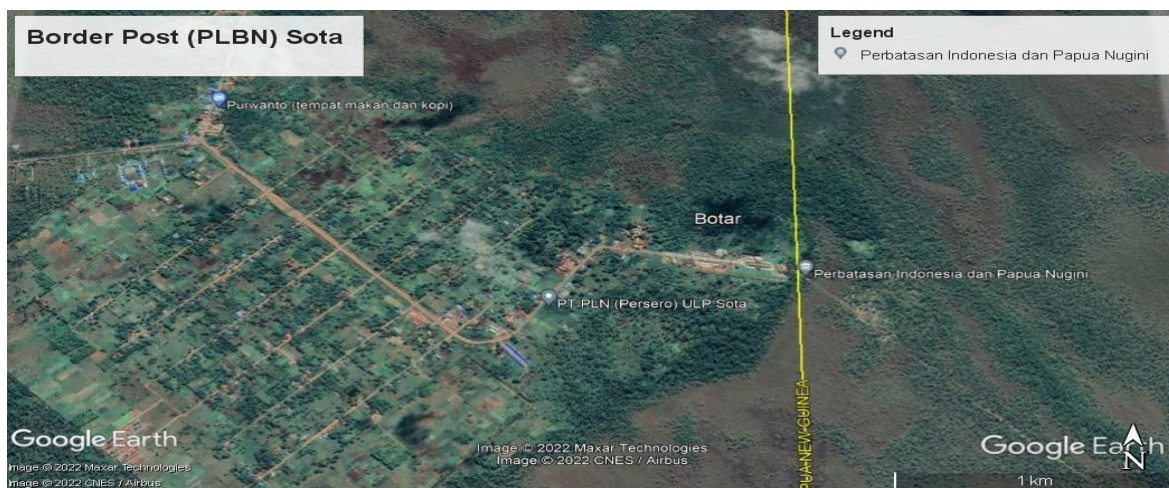


Figure 2. Maxar / Digital Earth Satellite image of the Sota border post and surrounding area including the Border of Indonesia and PNG (shown in yellow). *Source:* Google Earth (2022)



Figure 3. Maxar / Digital Earth Satellite image of the Sota border post facilities. *Source:* Google Earth (2022)

The results of the land cover assessment are shown at a large scale (2500 km²) in figure 4. A subsample of this area in figure 5 is used to characterize land cover to the East and West of the border (508 km²). This subsample is further divided into two, as shown in figure 6, to show the differences between the East (Merauke Regency) and West (Morehead district).

The results in table 1 and figure 7 outline the land cover characteristics including area for each land cover class across the single study site of 508 km². The study site comprises mostly woodlands defined as sparsely vegetated savanna (45.40%). These areas include Trans-Fly savanna, bamboo forests, and grasslands (Stronach, 1999; Yuliana, 2016; Setyarini et al., 2020). The bare lands make up

approximately 29.13%. These bare lands include vegetation that are more prone to fires including grassy plains and sparsely vegetated lands (Stronach, 1999). The forest classes cover 23.57% of the total study area. These include denser forests (including swamp forest), monsoon forest, coastal forest, bamboo forest, and large stretches of sago swamp forest (Stronach, 1999; Yuliana, 2016). Land for agriculture makes up 0.70% and are relatively limited to the settlements close to the border post on the Indonesian side of the border. These urban sites make up 0.68% and are primarily the residential areas and paved areas including roads with higher rates of runoff. Finally, the surface water bodies including rivers make up 0.52% of the total study area.



Figure 4. Visualisation of the results of the land cover classification of an area of 2500 km² within the wider area of the Southern Provinces of New Guinea. *Source:* Map from Google Earth Engine code editor in script developed by authors (2022)

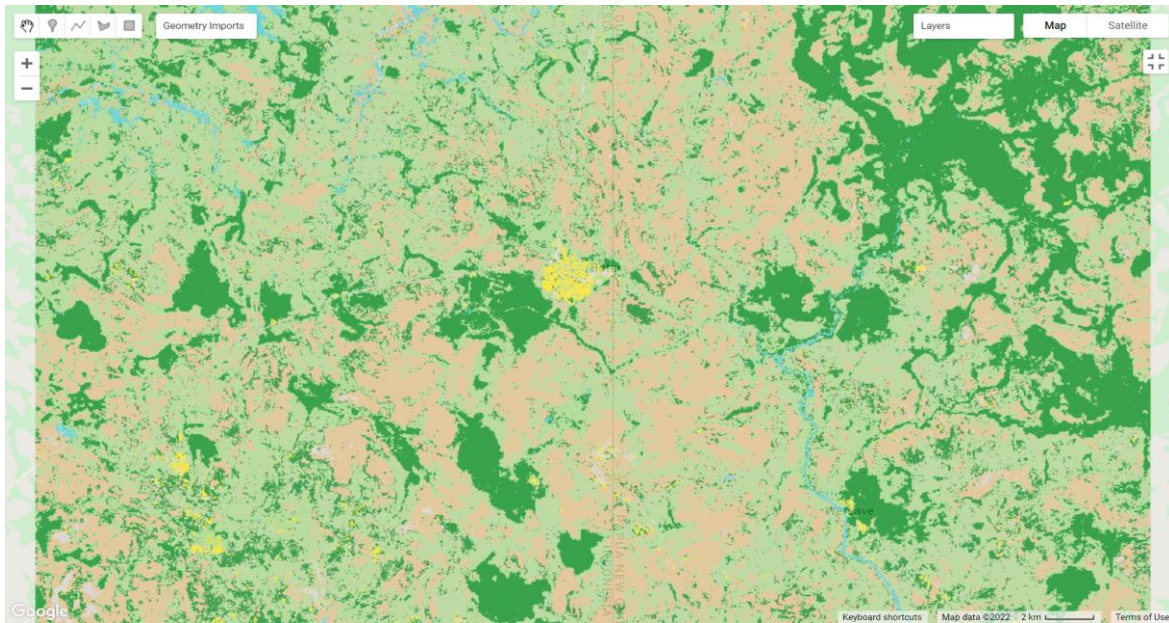


Figure 5. Subsamped visualisation of the results of the land cover classification (508 km²).
 Source: Map from Google Earth Engine code editor in script developed by authors and linked to figure 4 (2022)

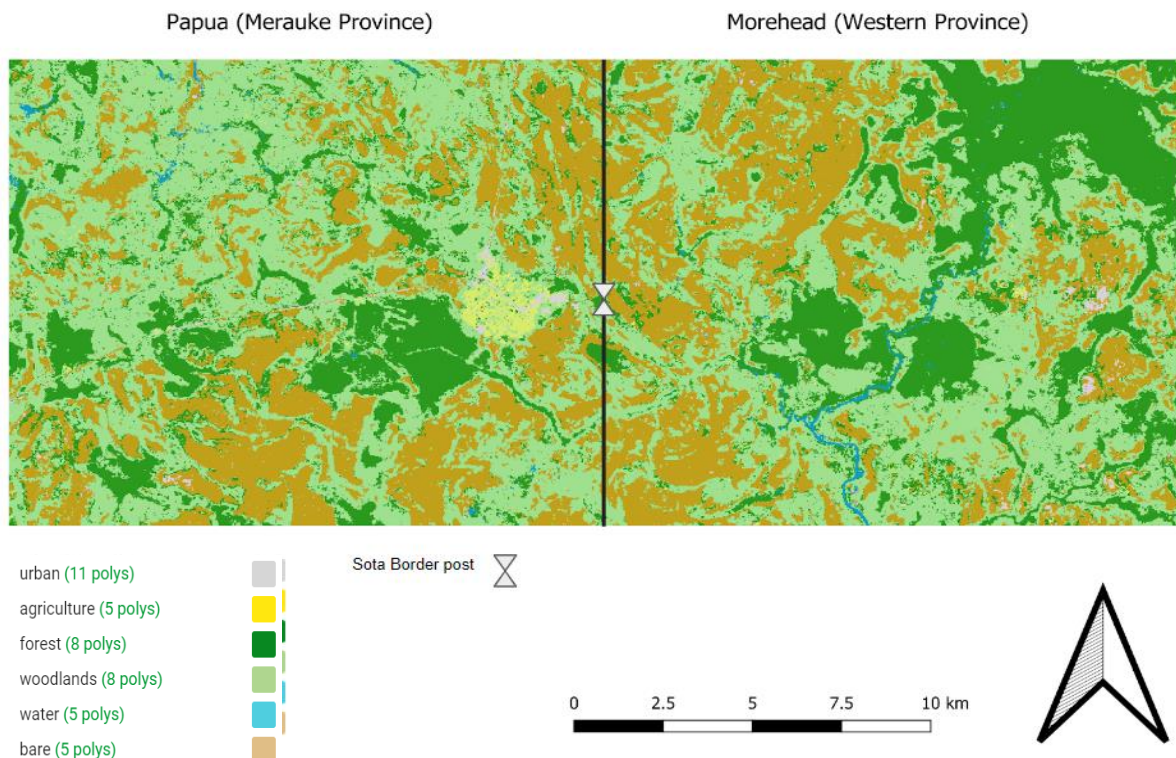


Figure 6. Land cover assessment across both the Sota sub-district, Merauke in Papua Province (254 km²) and the area of Morehead, Western Province, PNG (254 km²), directly adjacent to the border post symbolised in this map. Source: Map from Google Earth Engine code editor in script developed by authors and linked to figure 4 and 5 (2022)

Table 1. Summary of land cover assessment for total study area

	Area of land cover (km ²)	Percentage proportion (%)
Water	2.63	0.52
Urban	3.44	0.68
Agriculture	3.55	0.70
Forest	119.76	23.57
Bare	147.98	29.13
Woodlands	230.65	45.40
TOTAL	508.00	

Source: collated by the authors from the results of the analysis conducted Using Google Earth Engine and Quantum GIS (2022)

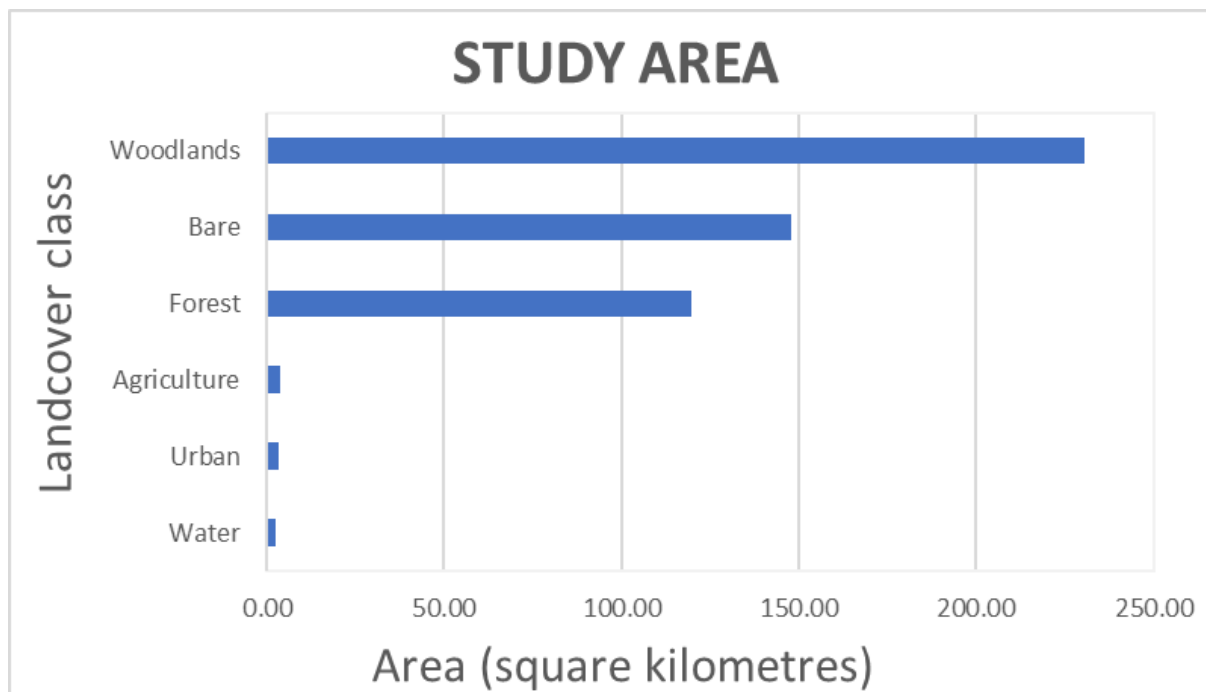


Figure 7. Summary of total land cover across both Merauke and Morehead sample areas.

Source: collated by the authors from the results of the analysis conducted using Google Earth Engine and Quantum GIS (2022)

The results in table 2 outline the land cover characteristics including areas for each class across a single study site from each side of the border. In terms of

percentages, as shown in table 3, the West subsample area in Merauke includes 49.93% woodlands, 29.15% bare lands and 18.77% forest. Agriculture makes up



1.11%, urban areas make up 0.71% and surface water is 0.34%. Across the border, the subsample area in Morehead is mostly made up of woodlands (40.88%), bare lands (29.11%) and forest (28.38%). Minor land cover classes in Morehead include surface water (0.69%), urban or paved areas (0.65%) and agricultural land (0.29%).

Figure 8 compares the percentage proportions of the land cover classes across the two subsample areas. The figure highlights how in Morehead there is a far greater proportion of surface water as compared to Merauke. This is likely a result of the larger Wereave River which

runs from North to South almost parallel to the border on the PNG side. There is also a much larger forested area in Morehead as compared to Merauke. This is primarily due to a large forested area identified in the Northeast of the study area towards the vast Fly River floodplain. In contrast, Merauke has a much larger proportion of agriculture and urban lands. This can be attributed to the development of the settlements in Sota. The other natural land classes including woodlands and some of the bare sparsely vegetated lands are much more similar in percentage proportion across both Merauke and Morehead.

Table 2. Summary of land cover assessment as area in km² for each land cover class across each of the two subsample areas in Merauke and Morehead

	Merauke (km ²)	Morehead (km ²)
Forest	47.67	72.09
Agriculture	2.81	0.73
Water	0.87	1.76
Urban	1.79	1.65
Woodlands	126.82	103.83
Bare	74.03	73.95
TOTAL	254.00	254.00

Source: collated by the authors from the results of the analysis conducted using Google Earth Engine and Quantum GIS (2022)

Table 3. Summary of land cover assessment as percentage proportion for each land cover class across each of the two subsample areas in Merauke and Morehead

	Merauke (%)	Morehead (%)
Forest	18.77	28.38
Agriculture	1.11	0.29
Water	0.34	0.69
Urban	0.71	0.65
Woodlands	49.93	40.88
Bare	29.15	29.11

Source: collated by the authors from the results of the analysis conducted using Google Earth Engine and Quantum GIS (2022)

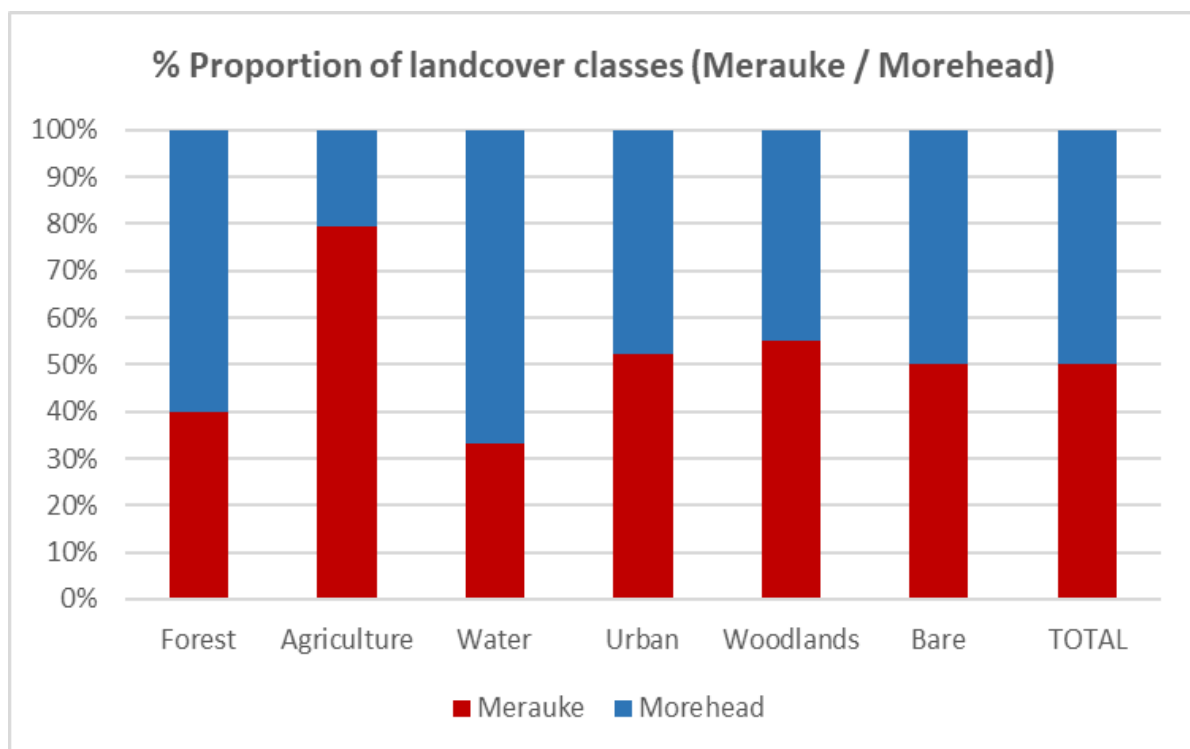


Figure 8. Percentage of each of the land cover classes in Merauke relative to Morehead.

Source: collated by the authors from the results of the analysis conducted using Google Earth Engine and Quantum GIS (2022)

Impacts of the development of the Sota Border Post

The development of the Sota border post has had a range of implications for the sub-district of Sota. These include population dynamics, migration, social, cultural, and economic changes as well as environmental and land cover changes. There were three main objectives within the development plan of Sota border post: 1) border security monitoring; 2) supporting economic growth; and 3) to showcase international standards of immigration border facilities of Indonesia. This ambitious vision has sought to transform this sub-district from a remote backwater station into a centre for advancement of border security, economy and social, cultural development (Mulyana, 2021).

A key impact of the development of the Sota border post can be seen in land cover changes. This border post was established with funding from the Indonesian Government in March 2019. The budget implications for this included approximately 103.6 billion Indonesian rupiah or approximately 7.25 million USD (Kementerian PUPR, 2021). The Sota border post has resulted in the demarcation, fencing-off, and paving of several zones. These have included an interior zone, a sub-interior zone, and a zone for the residents (Kementerian PUPR, 2021). As shown in the results section, this includes a border post interior zone of 0.055 km² and a total area of all zones covering 4.10 km²

The interior border post has a metal gate, a monument of the national symbolic Garuda figure, and a series of buildings for Custom, Immigration, Quarantine, and Security (CIQS) (Badan Nasional Pengelola Perbatasan RI, 2021a). In the sub-interior zone, there are approximately 16 buildings including a mosque and church. In the wider residential zone, there is a border market with 15 shops, a monument of the first Indonesian President, Ir. Sukarno, and a waste disposal facility (Kementerian PUPR, 2021). This residential area includes a self-sustaining infrastructure with electrical, water supply, water treatment, sanitation, electrical utilities, roads and parking (Kementerian PUPR, 2021).

In terms of the socio-economic impacts of the development of Sota, the market setup in the residential zone has become a hub for economic activity and international trade with people from Western Province, PNG (averaging up to 350 people per month) often coming into Sota market to buy Indonesian products, including agricultural products and food crops (rice, wheat flour, shallots, betel nut) as well as electronic goods, spare parts for vehicles and bicycles (Badan Nasional Pengelola Perbatasan RI, 2021b). In terms of larger-scale trade, the wider district of Merauke has become a main rice producing and exporting region of Eastern Indonesia. This is evidenced through Merauke Regency increasing export volumes to 15,000 tonnes of rice for export to Daru, the capital city of Western Province, PNG in 2020 (Astuti, 2021).

In terms of immigration, several agreements between Indonesia and PNG stipulate that every citizen living in the respective border areas of the two countries can freely enter and travel across the border area of the other party. They do so by obtaining a so-called Cross-Border Pass from the parties under the provisions stipulated in the agreement between the two bordering countries. At the Indonesia - PNG border, the movement is regulated under the Basic Agreement between the Government of the Republic of Indonesia and the Government of the Independent State of Papua New Guinea on Border Arrangements signed on 17 June 2013. The governments of Indonesia and PNG have agreed on enabling the use of traditional border crossing cards (similar to a second passport), red cards for people from Indonesia and yellow cards for people from PNG (Korwa & Sinaga, 2021).

With all of these migratory movements combined with economic development occurring in Sota and Merauke, this has at times led to a perception of socio-economic inequity on either side of the border. Both Sota and neighbouring Morehead in Western Province PNG were similarly remote and therefore economic development was not an imperative. However, with the establishment of the border post there was suddenly an imperative to rapidly escalate economic development for the settlement of Sota. This was further subsidised with a large injection of funding from the Indonesian Government (approximately 7.25 million USD).

This has led to a widening gap in terms of economic resources, assets and infrastructure on either side of the international border. For example, reporters from the PNG media: *The National* have commented on the disparity in economic growth and infrastructure as: “an international embarrassment where on the Indonesian side there is massive infrastructure and economic development but PNG villagers live in poverty deprived of Government services” (Faiparik, 2019). This is an example of the perceptions of inequity between the two districts.

Foundations of Indonesian Border Policy

The foundation of border infrastructure is complicated and requires collaboration, not only between various Ministry stakeholders from one country but also between the neighbouring countries. This is demonstrated most clearly in the example of Indonesia and PNG where the Central Government of Jakarta is over 3700 km away from the Sota border post. This is further than the distances from Sota to the capital of PNG, the Solomon Islands, Australia, and even the Philippines.

Alongside the geographic challenges, there are a range of legislative challenges. Muta’ali et al. (2017) maintain that even though twenty-three laws and regulations closely related to border management, only five laws, one government regulation, and three presidential regulations are in fact relevant. These five laws include: 1) Law

of Republic of Indonesia Number 17 of 2007 on The Long-Term National Development Plan of 2005-2025; 2) Law Number 43 of 2008 on State Territory; 3) Law Number 26 of 2007 on Spatial Planning; 4) Law Number 27 of 2007 on the Management of Coastal Areas and Small Islands; and 5) Law Number 32 of 2004 on Regional Government.

Meanwhile, the only government regulation closely related to border management is Government Regulation (PP) Number 26 of 2008 on National Spatial and Regional Planning (RTRW). The Presidential Regulations, which are closely associated with border management, are: 1) Presidential Regulation Number 5 of 2010 on the National Medium-Term Plan of 2010-2014; 2) Presidential Regulation Number 78 of 2005 on the Management of the Outermost Small Islands; and 3) Presidential Regulation Number 12 of 2010 on the National Border Management Agency. Muta'ali et al. (2017) describe three approaches introduced to border management: welfare, security, and environment. The physical manifestation of these policies has included the development of 11 border posts along the borders of Indonesia. The Sota border post was the second post developed in Papua after the Skouw border post in Northern Papua. The Sota border constitutes the most decentralised and geographically distant border post out of all of the posts of Indonesia. The development of the Sota border post in Merauke has been attributed to the potential for economic

growth for the region. Linking this border security post's construction to economic development can be viewed as an example of a welfare approach (Muta'ali et al. 2017; Teturan et al., 2019).

The welfare approach aims to stimulate the development of economic and trade activities in borderlands. This approach has four core policies: 1) Accelerating the development and security of Custom, Immigration, Quarantine, and Security (CIQS) facilities and infrastructure at the Cross-Border Inspection Post; 2) Accelerating the increase in economic growth in border areas; 3) Accelerating the quality of human resources in border areas; and 4) Accelerating the strengthening of institutional capacity for borderland development (Muta'ali et al. 2017; Teturan et al., 2019).

The security approach was also adopted. In this approach, the Indonesian National Armed Forces (TNI) plays a key role, with two dimensions, namely traditional and non-traditional defence. Traditional defence is carried out by establishing Boundary Security Posts and Joint Command Posts, while the non-traditional approach is demonstrated in examples where military operations might lead to economic development with potential funding to support communities. In addition, the security approach focuses on protecting the interests of national marine development in land-sea borderlands. In that context, the idea is to form a state border safety belt in the form of a buffer area or security zone (Muta'ali

et al., 2017).

Environmental approaches play an essential role in border management. These approaches focus on aspects of environmental sustainability and seek to minimise the impact of border area development activities, such as economic activities and trade with neighbouring countries. This approach also ensures ecological balance in the exploitation of natural resources such as coal, gold, petroleum and the exploitation of fishery resources that are not environmentally friendly (Muta'ali et al., 2017).

Implications for international relations and security

Indonesia and Papua New Guinea (PNG) established a diplomatic alliance after PNG was declared an independent nation in 1975 (Farneubun, 2016). The border between PNG and Papua province was previously a source of concern for the Indonesian government due to the complicated regional and international politics related to its governance of West New Guinea.

Indonesia's interest in political, economic, and social partnerships with PNG emerged because of PNG's geographical location as the only bordering country in the east. Since Indonesia took control of West New Guinea, nationalists as 'freedom fighters' fought for self-determination and often faced oppression from the Indonesian military. For decades after Indonesia assumed control of the territory, indigenous Papuans fled across the border

to Papua New Guinea (Bell et al., 1986).

PNG's determined interest in sustaining a relationship with the Indonesian government stems from the economic benefits associated with the partnership. Indonesia's government is partly interested in maintaining a relationship with PNG to secure political stability within Papua province. Indonesia also uses its partnership with PNG as an opportunity to extend its diplomatic relations with the rest of the Pacific region.

In terms of international relations theoretical frameworks, this border relationship between Indonesia and PNG can be viewed through the lens of liberalism. According to Moravcsik (1992), liberalism in international relations refers to a rejection of realism and machiavellianism as the key rationales driving international relations. Liberalism holds that international cooperation and mutual benefit is a more powerful driver motivating the interests and actions of nation states (Moravcsik, 1992). Liberalism is the political philosophy connected to the idea of limited governance. It encourages different religious beliefs and preferences of lifestyles and promotes freedom of speech for everyone in society. In practice, this is often not the case and all over the world we see liberal governments restricting people's freedoms, attacking human rights, and promoting economic and social instability. In economic terms, liberalism promotes competitive markets that are free from government interference (Freeman, 2017). To some extent it can be argued that

liberalism is demonstrated through the example of the cooperation of the Indonesia-PNG relationship in the co-management of the border. In particular, the presence of the Sota border post is expected to foster cooperation between the two nations, decrease conflict, and promote stability in the border of Indonesia and PNG. However, there may be others who argue that the asymmetrical nature of these power relations suggests that more realist motives drive Indonesia's rapid border development. From this perspective, Indonesia's motives driven by realism would constitute an example of unilateral action potentially driven by a range of nation-state interests.

In terms of relations between Indonesia and PNG, the review shows that much of the current context of the development of the Sota border post has taken place within a context of asymmetries of power. These asymmetries of power are better contextualised within a paradigm of realism rather than a paradigm of liberalism. This is particularly apparent within the borderlands between these two countries. Further evidence of this has been demonstrated in Indonesia's perspective on PNG's borders being based more on realist assumptions (survival, national interests, anarchy), even though, to some extent, Indonesia offers cooperation (liberalism) to deepen the bilateral trade ties (Antunes & Camisao, 2017; Elman, 2007; Shofa, 2022). Several previous cases prove this where many freedom fighters from West Papua used the border as a

sanctuary and gathered support for West Papuan independence while in PNG (Blades, 2020; Kabuni, 2021; Norotouw, 2017). These actions were perceived by the Republic of Indonesia as threats to national sovereignty and integrity. To reduce the risk of disintegration of national security and sovereignty, Indonesia has taken action to preserve their unitary state amid anarchy. The actions taken have included strengthening border security, such as constructing a Sota border post to control the entry and exit of people and attempting to improve the well-being of Papuan border communities to increase the sense of nationality and allegiance to Indonesia. In addition, Indonesia is aware that it is more powerful than PNG in terms of hard power and economic resources particularly in terms of investment along the borderlands. The Indonesian military expenditure (% of GDP), for instance, outweighs PNG in 2020, with 0.9% compared to 0.4% (The World Bank, n.d). Indonesia also has political authority and strong leadership on the global stage, such as becoming the G20 Presidency (2021-2022) and the Chair of ASEAN for 2023. Accordingly, these power asymmetries form perceptions and encourage Indonesia unilaterally to secure its national interests on the border according to a realist perspective.

CONCLUSIONS

The study meets three main objectives. Firstly, it provides a baseline land cover assessment that highlights the impact of

the development of the Sota border post. Secondly, the research and discussion highlight the socio-economic impacts of the development of this border post. Thirdly, the study shows the implications of the post through a disciplinary lens of international relations. Overall, the Sota border post has had a moderate impact on the adjacent borderlands with increasing urban paved areas and agriculture in the Sota settlement area. The land cover assessment provided within this study can contribute towards a baseline for a longer term time series study for environmental and geospatial monitoring.

The area assessed is limited compared to the vast expanses of woodlands and forest across Merauke. These land cover classes may also be linked to greater challenges in traversing, monitoring and regulating the migration of peoples along the borderlands. On the East side of the border, there has been little land cover impact. In terms of socio-economic impacts, the development of the post has led to a rapid increase in new economic activity in Sota. The markets, facilities and supporting economy that has arisen to support them have become important sources of livelihoods for communities along the borderlands. Furthermore, these have even become the source of greater widening perceptions of disparity between the two countries.

In terms of the lens and scale of international relations, the extent to which the border post can be viewed as an example of international cooperation driven by theoretical underpinnings of

liberalism is arguable. The asymmetries of power may also signal that this border post development may not be fully accredited to liberalism but may be driven more by Indonesia's realist motivations. In addition, there have been a range of socio-economic and biophysical impacts of the infrastructural and immigration capacities along the southern borderlands of New Guinea.

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