



## **THE PAN BORNEO HIGHWAY: A SECURITY IMPACT ASSESSMENT MEASURE (SIAM) MODEL ANALYSIS FOR KESBAN (SECURITY AND DEVELOPMENT)**

**Azrul Azlan Bin Abdul Rahman<sup>1</sup>, Abdul Rashid Bin Othman<sup>2</sup>, Mohd  
Shahfizul Bin Md Suaimi<sup>3</sup>, Mohd Aimullah Bin Kamaruddin<sup>4</sup>**

---

**Article History: Received:** 02.10.2022

**Revised:** 23.12.2022

**Accepted:** 15.03.2023

---

### **Abstract**

Pan Borneo Highway is a road network on Borneo Island connecting two Malaysian states, Sabah and Sarawak, with Brunei and Kalimantan region in Indonesia. The aim of this research is to conduct an analysis of the development plan's potential for growth and how this prospective growth will pave the way for an increase in the difficulty of sustaining security. The objective of this research is to identify security and development issues in the regions of Sarawak and Sabah, identify the activities that are being undertaken to mitigate security challenges and increase the development of these areas through projects such as the Pan-Borneo Highway and evaluate the future impacts of these projects in the context of Security and Development doctrine. By using Security Impact Assessment Measure (SIAM) Model Analysis as research methodology, this research found that The Pan Borneo Highway will run through a broad area, it will be important to make it secure and favorable to the growth and prosperity required for future development. Traditional risks have the lowest impact compared to non-traditional threats, with smuggling, human trafficking, smuggled products, and poachers having the most impact. This research is not only seen in Malaysia but can be extended to Brunei and Indonesia's perspective, especially Kalimantan outer ring road connectivity.

**Keywords:** Pan Borneo Highway, Security Impact Assessment Measure, Security and Development.

---

<sup>1</sup>Research Fellow, Centre for Defence and International Studies (CDISS), National Defence University Malaysia, Kem Sungai Besi, 57000, Kuala Lumpur

<sup>2,3,4</sup>Faculty of Defense Studies and Management, National Defence University Malaysia, Kem Sungai Besi, 57000, Kuala Lumpur

**DOI: 10.31838/ecb/2023.12.s3.050**

### 1. Introduction

Najib Tun Abdul Razak, a former Prime Minister of Malaysia, officiated over the formal opening ceremony of the Pan Borneo Highway on March 31, 2015 in Bintulu. The event was held to celebrate the completion of the highway. The Pan Borneo Highway will traverse vast lands, which means that additional development and safety measures will need to be taken in the future to ensure that the highway is safe and can thrive for future expansion. This is necessary to ensure that the Pan Borneo Highway can be successfully expanded in the future. This portion of the Pan Highway Borneo runs for a cumulative distance of 2,038 kilometres through the entirety of East Malaysia. It is a four-lane dual carriageway that connects Sabah and Sarawak and has a total length of 2,038 kilometres. There is no charge for using this highway (Redzuan, 2019). The idea of gradually constructing a single market that would enable free movement of products and services, as well as capital and employees with specialised abilities, is one that is currently being contemplated. This would allow for free movement of workers with specialised skills and capital. To put it succinctly, the fundamental goal is to make it feasible for investment, capital, commodities, services, and skilled labour to flow freely inside East Malaysia. This is stated as a

goal in the nutshell.

This will make it possible for East Malaysia to expand its networks of commerce and production, therefore creating a market that is more integrated for the region's consumers and enterprises. It is believed that Tun Abdul Razak was the one who initiated the security and development programmes in the 1970s, and the Pan Borneo Highway Project in East Malaysia may be considered as another analogous approach by the government at this present time period (Abrullah, 2018). As a consequence of this, it is essential to strike a balance between the development in each region in order to ensure that people in Sabah and Sarawak, which are comprised of a diverse range of ethnic groups and cultural traditions, have a sufficient understanding of the positive effects that will result from the construction of the Pan Borneo Highway. These people will be able to appreciate the benefits that will accrue as a direct result of the Pan Borneo Highway. This carefully thought-out evolution would earn their support for the administration and win the trust of the general people in the notion. After that point, the mobility aspect will be obtained among the public, which is essential in order to begin the process of neutralising the element. After that point, the element will be neutralised.



Figure 1.1: Pan Borneo Highway extend in Sarawak. Source: JKR, Sarawak (2022)



Figure 1.2: Pan Borneo Highway extend in Sabah Source: JKR, Sabah (2022)

### **Problem Statement**

There are many security and development issues and challenges that Malaysia has identified across the Sabah and Sarawak (Dollah et al., 2016). Most security challenges are from Non- Traditional threats, which are potentially exasperated with lack of development particularly socio-economic in these areas. The Pan-Borneo Highway project is designed to enhance the transportation links across Sarawak and Sabah, extending into Brunei and the Kalimantan regions of Indonesia, with the objective to increase the economic development of the regions through the creation direct and indirect development opportunities (Sloan et al., 2019). In the context of the KESBAN doctrine, projects such as the Pan-Borneo Highway enhance the development and security of these affected areas of Sabah and Sarawak (Zulkifli, 2022). Therefore, the primary focus of this research will be on doing an analysis of the potential for growth in the development plan and how this potential growth will pave the way for an increase in the difficulty of preserving security. In other words, the research will investigate the potential for growth in the development plan will pave the way for an increase in the difficulty of maintaining security.

### **Research Objective**

For this study have three research objectives to fulfil research first objective is to identify security

and development issues in the Sarawak and Sabah regions. Second is to analyse efforts to mitigate security challenges and activities to enhance development across the Sarawak and Sabah regions, particularly those related to the Pan-Borneo Highway and third objective is to evaluate the future effects to security and development of activities related to the Pan-Borneo Highway project.

### **2. Research Methodology**

This research went through three phase which are, first phase is data collection of literature reviews, second phase discussion analyse development and security, economy stability spill over and impact of Pan highway Borneo using KESBAN concept and results of the study analyse using Model Security Impact Assessment Measure (SIAM). Research methodology in this study have three phase which are as follow:

Phase 1. Collecting data and literature review this will find result and theme to the research, during visit related agency are giving briefing the impact of Pan Borneo Highway in KESBAN concepts there are 21 Agency government and non-government are involved for this briefing. Collecting data by question and answer session in after briefing by respective persons. List of agencies are involved are shown at figure 2.1

No.	Agency	Speaker's
1	Air Region 2 Headquarters	Assistant Chief of Staff A5
2	Army Field Command East (AFCE)	Chief Director of Operation and Training
3	5 Inf Div	Chief of Staff
4	National Security Council (NSC)	Sabah - Assistant Director Sarawak - Assistant Director (Military)
5	Malaysia Immigration Department (MID)	Sabah – Enforcement Division Sarawak - Deputy Assistant Director
6	Royal Malaysia Customs Department (RMCD)	Sabah – Secretariat Branch Sarawak - Superintendent of Customs Customs Contraband Enforcement Team (CCET)
7	University Malaysia Sabah (UMS)	International Relations Programs, Faculty of Social Science and Humanities (FSSH)
8	Eastern Sabah Security Command (ESSCOM)	Chief of Staff Operation
9	Royal Malaysia Police (RMP)	Sabah - Deputy Chief Criminal Investigation Dept Sarawak - Deputy Chief of Sarawak Criminal Investigation Dept
10	Sabah State Government	Deputy Director

11	Public Works Department (JKR)	Sabah – Deputy Director Project Sarawak - Senior Engineer
12	Sabah State Economic Planning unit (EPU)	Deputy Director
13	Sabah Economic and Investment Agency (SEDIA)	Chief Strategy Planning Officer
14	Desa Cattle Dairy Farm	Head of Agro
15	Rainforest Discovery Centre (RDC)	Forestry Officer
16	Wildlife Department	Head of Enforcement Division
17	Sabah Forestry Department	District Forestry Officer
18	Sepilok Orangutan Rehab Centre (SORC)	Veterinary Officer
19	Tourism Sarawak	State Director
20	University Malaysia Sarawak	Senior Lecturer Faculty of Social Science UNIMAS
21	Sarawak Economy Planning Unit (EPU)	Deputy Director

Figure 2.1: List of Government and Non-government Agencies

Source: Develop by researcher

Phase 2. Discussion on Security and Development, in this phase will identify issue or spill over of impact that effect from Pan Borneo Highway. This also will identify that construction of the Pan Borneo Highway has had an influence on East Malaysia that may be characterised as both advantage and disadvantage. Massive project will be able to catapult East Malaysia to the next stage of development.

Phase 3. By using Analysis SIAM model can only be used to conduct an evaluation of one of the potential solutions to the problem and threats. When there are many diverse options to take into consideration, it is necessary to create individual assessment scenarios for each of those possibilities. In other words, there should be a separate review carried out for each and every potential action, and it should be feasible for all of these evaluations to take place at the same time. The results of the individual assessments may be used as a source of information in both the evaluation and the comparison. Both of these processes are able to take these results into account.

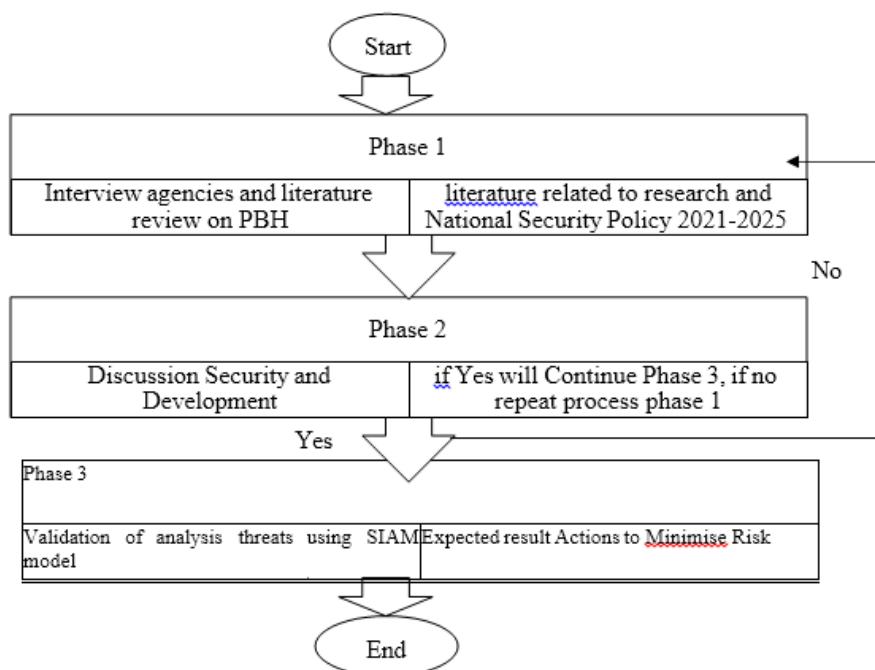


Figure 2.2 Methodology Flowchart of this research  
Source: Develop by researcher

## LITERATURE REVIEW

### 5.1 Impact of Pan Highway Borneo to Development

It is anticipated that the completion of the Pan Borneo Highway in 2023 will, in a manner that is comparable to that of previous highways, bring about favourable and improved results for the states of Sabah and Sarawak. These expectations are based on projections made by the government of Malaysia (Wong et al., 2017). It is predicted that there will be an increase that is eight times greater, particularly in the fields of tourism, infrastructure development, and logistics as a result of the fact that it will undoubtedly provide access to regions that were previously inaccessible. The reason for this is because it will undoubtedly provide access to regions that were previously inaccessible (Douglas & Douglas, 1999).

There is no doubt that local businesses, such as those dealing in house rentals, local items and handicrafts, as well as services related with

sightseeing, would unquestionably profit from this initiative, which will have a favourable influence on the bottom lines of those businesses (Mat et al., 2015). Aside from the hospitality industry, this project is widely regarded as the keystone of the public transit network. This is as a result of the fact that it offers its customers a heightened and more joyful travelling experience, all while cutting in half the amount of time required to finish the route. In 2022, the economy of Sarawak, which is the third largest of the states that make up Malaysia, generated 6% of the overall gross domestic product (GDP) of Malaysia. Sarawak is the third largest of the states that make up Malaysia. The size of Sarawak's population makes it the third biggest of the states that comprise Malaysia. It has traditionally placed a significant emphasis on the exploitation and export of natural resources, including as oil and gas, lumber, and palm oil, and it is anticipated that it will grow even more after construction of the Pan Borneo Highway is finished.

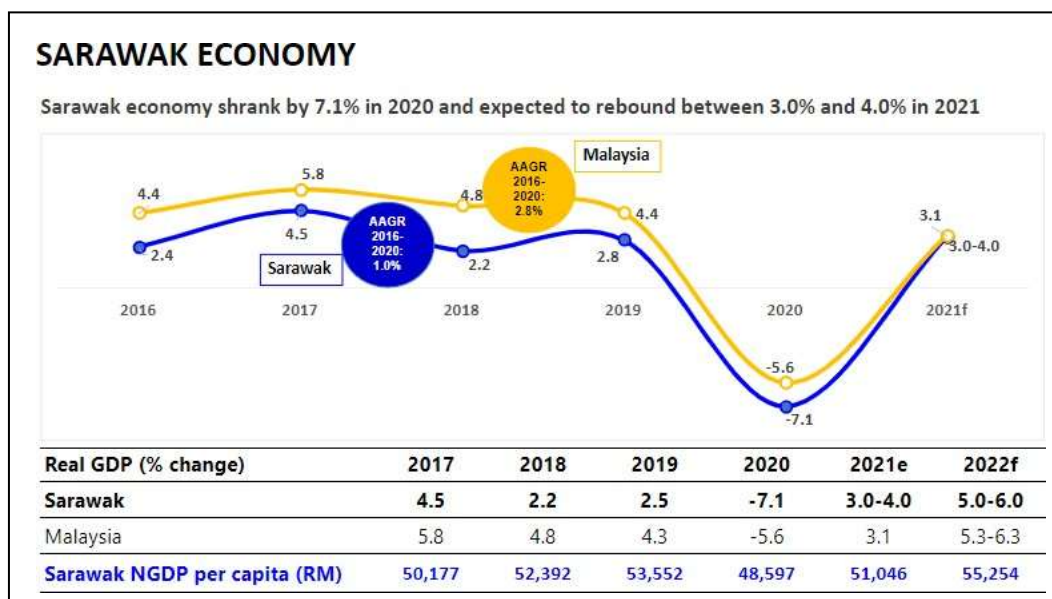


Figure 3.1: Sarawak Yearly GDP  
Source: Economic Planning Unit, Sarawak (2022)

By reducing the amount of time of travel it takes to move goods and by increasing the extent to which rural regions can be accessed, the Pan Borneo Highway will improve the connectedness of the region as well as the productivity of businesses that provide local transportation services. This will be accomplished by increasing the extent to which rural areas can be accessed. Both advantages will become attainable as a direct result of the development of the route. This will result in a decrease in the cost of transportation, which, in turn, will lead to an improvement in the accessibility of services in rural areas as well as an increase in the availability of commodities that are priced more competitively (Abram et al.,

2022). Moreover, this will lead to an increase in the availability of goods. In addition to this, those who live in rural regions will see an improvement in their quality of life as a direct result of this. A total of around 400,000 new jobs have already been generated as a direct consequence of this effort across the totality of the two states that are taking part in it (Ikau et al., 2019). In addition to the positive effects that it has already had on the economy, this is another one of its benefits. 2019 GDP for Sabah was 85,444 million RM. GDP of Sabah increased from 85,009 million RM in 2018 to 85,444 million RM in 2019 growing at an average annual rate of 3.8% this also expected to be increase when completion of Pan Borneo Highway.

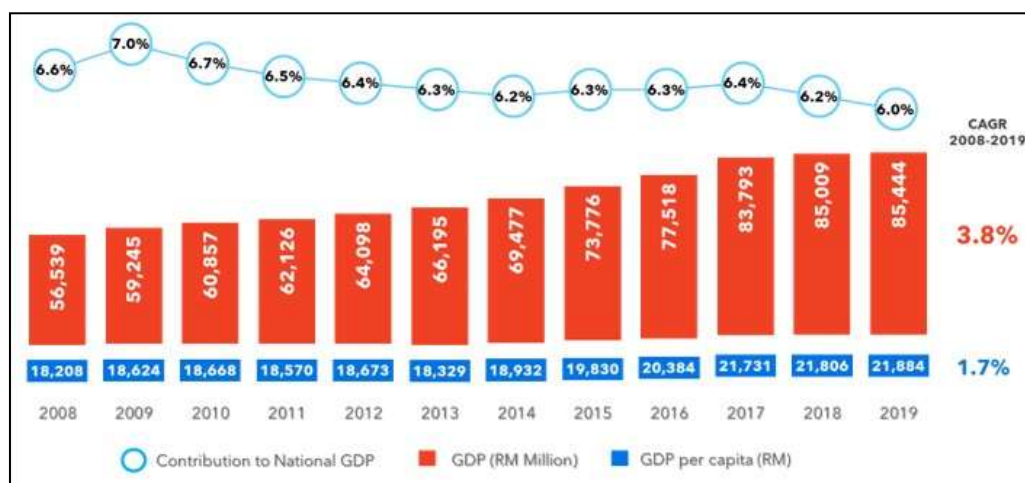


Figure 3.2: Sabah GDP per capita 2008 to 2019  
Source: Sabah Economic Development and Investment Authority (2022)

Despite this, local residents in both states have access to significant employment opportunities, whether it be in the construction industry or in the retail sale of locally produced goods in their respective regions. For example, the construction industry in both states employs a significant number of local residents. Construction sector in both states is responsible for the employment of a sizeable percentage of local workers. Since the inauguration of this initiative, the unemployment rate had really been going down, and on top of that, it contributed to contribute to the overall economic growth of both states. For example, in Sarawak, the first phase of the project has already resulted in the fabrication of 11 work packages, the most majority of whose job scopes consist of extending the existing two-lane federal road into a configuration that can accommodate four lanes of traffic. This was completed successfully during the first phase of the project (Akob et al., 2019). For constructing motorways throughout the state of Sabah, from

Sindumin all the way to Tawau through Sipitang, a sub-project with a total value of RM 12.8 billion and comprising of 35 distinct packages is now under construction. In December 2017, seven of these packages were finished, bringing the overall completion rate of the project up to 75 percent. The completion of the megaproject is extremely important for the expansion of Sabah's economy

(Sloan et al., 2019). This is due to the fact that the megaproject has to be able to provide assistance for the oil and gas economic sector in order for the economy of Sabah to expand.

## 5.2 Security Issues Impact of Development Pan Highway Borneo

Illegal behaviour, such as the hiring of illegal immigrants in the construction business, has a larger chance of occurring since it is possible that unlawful immigrants may be paid less than the local population (Zulkifli, 2022). This fact makes it more likely that illegal action will take place. This is one of the reasons why there is a larger possibility that illegal conduct will take place since there are more opportunities for criminal action. Additionally, there is a possibility that the illegal activities of smuggling and human trafficking may see a slight increase as a result of improvements made to the road access that the smugglers and traffickers use to sneak their goods and services into the country (Eilenberg, 2012). This is a possibility because there is a possibility that the road access that the smugglers and traffickers use to sneak their goods and services into the country may be improved. This is a possibility due to the fact that there is a chance that the people who smuggle and trade drugs will have better access to the highways.



Figure 3.3: Police booty smuggling goods  
Source: PDRM, Sabah (2022)

Other than non-traditional threat or criminal activities, environmental security also occurs due to Borneo being among the largest islands figure 2.4 below show that National Security brief on current issues to criminal activity at Sarawak border. It has been agreed that the construct of the Pan Borneo Highway would be followed by the deployment of both civilian and military organisations and troops in order to function as a deterrent force for this issue (Dollah et al., 2016). This is something that has been discussed and decided upon. To ease the issues and challenges that are now being encountered to security, something is being done in order to make this happen. To maintain order and cut down on the amount of illegal activity that takes place in certain areas, a big number of various local officials, including those from the Department of

Customs and Immigration, are going to be stationed there in the near future. In addition, the police must be involved in certain hot point places and routes that residents of both Malaysia and Indonesia utilise to convey their goods and services (Hitchner et al., 2009). These routes and locations include both land and waterways. These areas and routes contain both land-based and maritime transportation corridors in their entirety. These passageways and locations include highways in addition to minor streets and alleyways. If the military, police, and local authorities are deployed to assist in decreasing the rate of crime, it will further improve the economy of the state by allowing for the legitimate and appropriate purchase of products and services. In the context of our efforts to reduce overall criminal activity, this will be carried out.



Figure 3.4: Issue and Challenges – Illegal Crossing Borders Activity  
Source: NSC, Sarawak (2022)

### CONCEPTUAL FRAMEWORK

Project have been briefing by respective speaker lots of information were gather during these sessions. All information that can be conclude as Traits of project Pan Borneo Highway are Integrity, Accuracy of Project, Human Capability and Modern Technology. Integrity is the main factor that must have at all agencies to keep security and good management at all levels will make this project complete and vision of east Malaysia to see develop can be reality. Accuracy of Project is professional such an Engineer of project such JKR and other contractor can manage good project that can be complete in time

accuracy of timing, structural and budgeting all in good manage. Human Capability can be making all this happen with support of Enforcement Agencies to avoid criminal activity impact of spill over the project. Human capability also can be mean of expertise of all agencies gave and advise on subject matter expert such as rainforest avoiding critical area. Lastly is modern technology not just in development technology of construction but modern technology of enforcement agencies such as military conducting operation using drone for patrolling near the border relevant to Pan Borneo Highway.



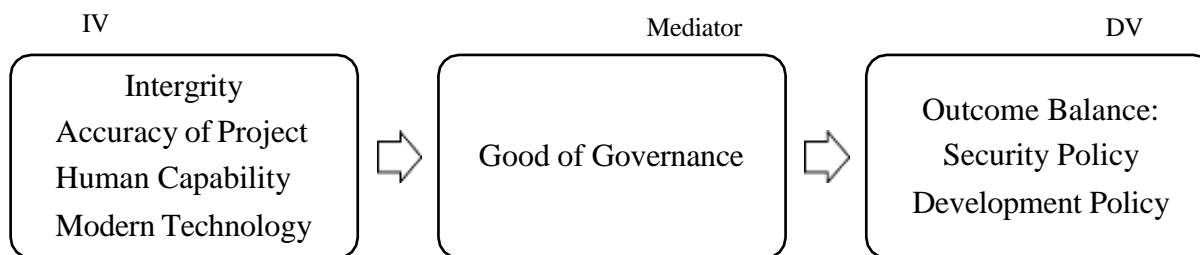


Figure 4.1 Conceptual Framework Balance outcome model of Pan Borneo Highway  
Source: Develop by researcher

**Analysis and Result**

**7.1 Analysis Model Security Impact Assessment Measure (S.I.A.M)**

SIAM model had been chosen because most significant analysis threat model relevant to Pan Borneo Highway (Hempel et al., 2012). To balance between development and security in Sabah and Sarawak in KESBAN concepts. Method are being use according to Barry Buzan 5 sector Security relevant to National Security threats. Because limitation of time for collecting data and survey,

brainstorming is the best method to evaluate value of severely and impact matrix.

Step 1: What are the threats?

There are 66 threats has been highlighted by National Security Council and strategy been taken on policy 2021-2021 (El-Muhammady, 2021). Threats had been categories by policy related to and relevant to Pan Borneo Highway and National Security Policy perceptive. 12 Threats have been identified from 66 threats NSC that relevant to Pan Borneo Highway. Figure 5.1 show the relevant to Pan Borneo Highway to National Security Policy.

No	Threats	National Security Policy 2021-2025
1	Environmental	Development of Self-Reliance Capabilities
2	Military / Security	Defence Cooperation
3	Smuggling	Cross Border Crime
4	Illegal Immigrant	Illegal Immigrants
6	Criminal	Separatist Movement & Ideology
7	Human Trafficking	Socio-Economic Disparity
8	Wildlife & Rainforest	National Resource Management
10	Smuggling	Smuggling Activities at Border Area and Entry Points
12	Drug	Narcotics Related Crime

Figure 5.1: Relevant to Pan Borneo Highway and National Security Perspective  
Source: Develop by researcher

Step 2: Proposes five components of security, all of which are interconnected with one another, as a means of offering an explanation for the challenges that are linked with the idea of security (Buzan et al., 2003). Matrix creation and assessment of probability of occurrence on Pan Borneo Highway

threats are most relevant selected to sector. Lowest marks are Very Unlikely (1) and highest is Very High (5). This step was brainstorming to identify Probability Of Occurrence from marks from Very Unlikely to Very High according to 5 Sectors security. Figure 5.2 show threats marking relevant to 5 sector security perceptive of Pan Borneo Highway.

Pan Borneo Highway	Sector				
	Politic	Military / Security	Economy	Social	Environmental
Smuggling	3	2	5	4	1

Wildlife, Poches/ Rainforest	2	3	4	1	5
Criminal	2	1	3	5	4
Illegal Immigrant	1	3	5	4	2
Human Trafficking	2	1	5	4	3
Drug	1	2	3	5	4

Figure 5.2: Threat and Sector Matrix.

Source: Develop by researcher

Step 3: Assessment of Impact and Severity

This step was assessed on severity and impact to Pan Borneo Highway marking are Uncritical (1), Marginal (2), Significant (3), Critical (4) and Disastrous (5). This step also was brainstorming to identify marking threats to impact for 5 sector security to Pan Borneo Highway. The threat is referred to traditional and non-traditional which

are Politic, Military or Security is refer to Traditional whereby Economy, Social and Environmental refer to non- traditional. First row is Probability of Occurrence marking and second row are Severity and Impact marking. Figure 5.3 Show assessment of impact and severity relevant to Probability of occurrence.

Pan Borneo Highway	Sector				
	Politic	Military/ Security	Economy	Social	Environmental
Smuggling	3	2	5	4	1
	3	2	5	4	1
Wildlife/ Poches/ Rainforest	2	3	4	1	5
	2	1	4	3	5
Criminal	2	1	3	5	4
	4	5	3	2	1
Illegal Immigrant	1	3	5	4	2
	3	2	4	5	1
Human Trafficking	2	1	5	4	3
	1	2	5	3	4
Drug	1	2	3	5	4
	1	5	3	4	2

Figure 5.3: Assessment of Impact and Severity

Source: Develop by researcher

Step 4: Creation of risk categories

This step involves the creation of risk categories. These categories are created by combining the probability of occurrence with the impact/severity assessment. The scores that are given thus refer to the multiplication of the probability of occurrence with the severity. This table is focused to visualize and prioritize the different threats. This very important for the selection of scenarios that need to be developed in next step, and in addition to the scenario development the table will provide

valuable information for the draft of the combined scenario threat report. In this stage we assess the severity of the threat based on its impact on several society dimensions as detailed in previous step. As seen in the table we use scales of 1-5 to assess the probability of occurrence and the severity of the threat. See also previous step for further explanation of the impact assessment. This step we found probability of occurrence to impact that three very high and disastrous, first point smuggling impact to economy, second

wildlife and rainforest impact to environmental and third are human trafficking impact to

economy.

Figure

5.4 show that Risk Categories probability and severity or impact are most to non- traditional threats.

Probability Of Occurrence	Very High (5)			* Criminal (Social)	* Drug (Social) * Illegal Immigrant (Economy),	* Smuggling (Economy) * Poches, Wildlife, Rainforest (Environmental) * Human Trafficking (Economy)
	High (4)	* Criminal (Environmental)	* Drug (Environmental)	* Human Trafficking (Social)	* Smuggling (Social) * Poches, Wildlife, Rainforest (Economy),	* Illegal Immigrant (Social)
	Possible (3)	* Poches, Wildlife, Rainforest (Military)	* Criminal (Economy)	* Smuggling (Politic)	* Human Trafficking (Environmental)	
	Low (2)	* Illegal Immigrant (Environmental) * Human Trafficking (Politic)	* Smuggling (Military) * Poches, Wildlife, Rainforest (Politic)		* Criminal (Politic)	* Drug (Military)
	Very Unlikely (1)	* Drug (Politic) Smuggling (Environmental)	* Human Trafficking (Military)	* Poches, Wildlife, Rainforest (Social) * Illegal Immigrant (Politic)		* Criminal (Military)
		Uncritical (1)	Marginal (2)	Significant (3)	Critical (4)	Disastrous (5)
	Severity / Impact					

Figure 5.4: Risk Categories  
Source: Develop by researcher

Step 6: Risk Description and action to be taken to minimise the risk. For each classification two classifications are selected. The first situation is a Probability and Severity, and the second situation is a 'very unlikely/disastrous' scenario. The situation narratives provide information about the scenario unfold as well as description about the reasons for that minimise the risk. Identify 30 risk put in on

schedule from very high and disastrous down to Very Unlikely and Uncritical. Description column will descript risk impact to Pan Borneo Highway and Column minimise the risk, is action to be taken is a proposed action for agency are involve. This propose can be review on development policy or security policy on next step. Table 5.1 show that risk assessment and action to be taken.

No.	Risk	Description	Probability	Severity	Actions to Minimise Risk
1	<b>Smuggling (Economy)</b>	Smuggling goods impact to reduce drop Sabah GDP and impact to economy will make serious economy crisis	<b>Very High</b>	<b>Disastrous</b>	Identify the critical hot spot area. Control subsidies goods from smuggling especially connecting route Pan Highway Borneo and Kalimantan focus Border management.
2	<b>Human Trafficking (Economy)</b>	Human trafficking impact to Economy entering using legal document such as visit then document then illegally contribute to criminal activity and drop economy but increase others problem	<b>Very High</b>	<b>Disastrous</b>	Organize a get-together with the purpose of increasing awareness in which people will watch films about human trafficking and then discuss them. Examine the ways in which modern slavery is still practised today, see an investigative documentary on gender trafficking, or investigate the ways in which forced labour might affect global food supply chains, for instance.
3	<b>Poachers, Wildlife &amp; Rainforest (Environmental)</b>	Wildlife are victims to poachers near to border and rainforest threats to illegal logging	<b>Very High</b>	<b>Disastrous</b>	stringent limitations on the domestic trade of ivory, including the prohibition of the selling of ivory over state boundaries and the capping of ivory trophy imports at two items per hunter, once every twelve months. In order to get over these federal limitations, illegal ivory is frequently passed off as antique. East Malaysia only state that must additional regulation prohibitions on top of the federal legislation.
4	<b>Illegal Immigrant (Economy)</b>	Illegal immigrants are seeking for job at near border and seeking asylum this give serious impact to economy	<b>Very High</b>	<b>Critical</b>	Strengthen the borders. Government and non-government agencies must have cooperation. Where information from civilian to the military or enforcement to act. Modern technologies are helping in patrolling
5	<b>Drug (Social)</b>	Drug impact to social of local citizen near at rural and city area where can destructive social life.	<b>Very High</b>	<b>Critical</b>	Gaining information and intelligence are important beside strictly law enforcement. Then educate local people especially in rural area about risk of drug. Learn about the possible side effects of the drugs

6	<b>Illegal Immigrant (social)</b>	Illegal immigrant impact to social are when they get involved in community some criminal activity will happen and might affect to social life of community.	<b>High</b>	<b>Disastrous</b>	Imposed heavier penalties onto middleman
7	<b>Crime (Social)</b>	Crime impact to social threatens public health and safety, upsets social order, causes unrest and uncertainty, stop efforts to foster community cohesion and trust, and imposes significant financial costs on the population	<b>Very High</b>	<b>Significant</b>	Taking into account on public complaints related to matter involving misconduct, corruptions and bribery by closely works with SPRM.
8	<b>Smuggling (Social)</b>	Smuggling impact to social because of the difficulties of the economy and the high unemployment rate, they are obliged to smuggle and are willing to suffer and put themselves in risk.	<b>High</b>	<b>Critical</b>	The most successful strategies to deter migrant smuggling are law enforcement, educational campaigns, and victim protection. Lawbreakers. The police utilise disruption and deterrents to combat crime.
9	<b>Poachers, Wildlife &amp; Rainforest (Economy)</b>	Poaching and hunting create damage to the ecosystem of the rainforest by eliminating species that are essential to the functioning of the ecosystem.	<b>High</b>	<b>Critical</b>	Wildlife and rainforest with Op Kazanah must coordinate the data and operation but this uncrucial to military and police.
10	<b>Human Trafficking (Social)</b>	Human trafficking impact to social in many survivors contract infectious diseases including sexually transmitted infections and develop mental health conditions, including anxiety, panic disorder, and major depression	<b>High</b>	<b>Significant</b>	To avoid issues will misinterpret my media and create uncertain condition.
11	<b>Human Trafficking (Environmental)</b>	Women, men, and children who are victims of human trafficking are subjected to forced labour and commercial exploitation in Malaysia, which serves as both a destination and transit country for these individuals. High demand for persons who can be exploited for low-wage labour, beggary, or sexual exploitation is one of the key factors contributing to the rise of human	<b>Possible</b>	<b>Critical</b>	The government is taking preventative measures against human trafficking. Tose measures describe a comprehensive, government-wide strategy to combat human trafficking, including initiatives to increase convictions of traffickers, improve victim protection, and prevent the crime from occurring within and beyond our borders.

		trafficking in the modern world.			
12	Drug (Mil/Sy)	The threat that illicit narcotics represent to national security.	Low	Disastrous	As a result of the fact that drug traffickers are familiar with the strategies used by police, the latter would benefit from having access to the most cutting-edge equipment currently on the market to confront new gangs and drug users.
13	Drug (Environmental)	Cannabis, cocaine, opium, and Ecstasy are all illicit narcotics that, when consumed, can harm the environment. There is a possibility that this will result in deforestation and the erosion of soil. In 2018, 269 million individuals abused illicit substances such as cocaine and marijuana.	High	Marginal	Decision-makers need to use the Whole of Government (WoG) approach, which consists of multi-party and multi-organizational governments. to deal with the drug that caused environmental pollution and deforestation.
14	Drug (Economy)	Drug trafficking refers to the illegal transportation of marijuana, cocaine, heroin, and other narcotics. International drug trafficking involves the illegal distribution of controlled substances.  Multiple elements contribute to the globalisation of the drug trade. Most of the factors are related to drug demand, supply, relationships between demand and supply, and money.	Possible	Significant	By developing policies, providing preventative education, research, treatment, rehabilitation, and reintegration programmes, developing alternative development initiatives, and coordinating efforts with regional, international, and peer organisations and agencies, individuals can be liberated from the grip of drug addiction.

15	Smuggling (Politic)	An increasing number of rural Malaysians are engaging in smuggling because of their difficult financial circumstances and the temptation of several criminal organisations.	Possible	Significant	<p>Law enforcement needs more patrols, technology, and intelligence- gathering capabilities. To eradicate corruption, procedures and personnel must be regularly checked and cycled.</p> <p>The government has increased border patrols, particularly in illegal routes (lorong tikus) regions. Intelligence and operations must be handled with integrity and without ulterior motives for the sake of the nation.</p> <p>The most successful strategies to deter migrant smuggling are law enforcement, educational campaigns, and victim protection. Lawbreakers. The police utilise disruption and deterrents to combat crime.</p>
16	Crime (Politic)	Misuse of power, corruptions and bribery among the civil servants and agencies can derail the cause.	Low	Critical	<p>Audit check should be made periodically to ensure there is no mismanagement and bribery among the civil and private agencies that involve in the PBH.</p> <p>Taking into account on public complaints related to matter involving misconduct, corruptions and bribery by closely works with SPRM.</p>
17	Crime (Mil/Sy)	Bribery and misuse of power among Mil/Sy agencies that seldom happen but will gave a huge impact and consequences	Very unlikely	Disastrous	<p>Ensuring the SOP and instructions issued are reviewed and updated frequently.</p> <p>Heavy punishment towards the personnel.</p> <p>Surprise inspection by higher authority or intelligence to ensure the integrity of personnel</p>
18	Crime (Environmental)	Illegal logging and poachers are seemed to be taking and advantages the ease of using the PBH to smuggle out the logs and animals.	High	Uncritical	<p>Cooperate with security agencies closely to prevent from happening.</p> <p>Enact Stricker laws and impose heavier penalties on offenders.</p>

19	<b>Illegal immigrant (Mil/Sy)</b>	Mil/Sy receiving threat from middleman handling the illegal immigrants.  Broad area to be covered by Mil/Sy agencies to monitor the route used by illegal immigrants.	<b>Possible</b>	<b>Marginal</b>	Imposed heavier penalties onto middleman  Procuring a higher technology equipment (Radar and UAV) to monitor the possible route used by illegal immigrants  Working closely with the civilian to receive information on the likely area used by the illegal immigrant to enter and exit the border
20	<b>Crime (Economy)</b>	The impact on the confidence of foreign investors will be diminish and it will indirectly impact the local economies.	<b>Possible</b>	<b>Marginal</b>	Strengthening and equipping the local security agencies and local authorities with latest equipment.  Giving Security Agencies and local authorities more power to deal with crimes  Increasing the numbers of security agencies and local authorities in the developing area  Increasing the numbers of security post in the rural area
21	<b>Poachers, Wildlife &amp; Rainforest (Mil/Sy)</b>	The impact is very low because this usually are target to wildlife and rainforest and poachers always prevent to meet with military or police.	<b>Possible</b>	<b>Uncritical</b>	Wildlife and rainforest with Op Kazanah must coordinate the data and operation but this uncritical to military and police.
22	<b>Poachers, Wildlife &amp; Rainforest (Politic)</b>	This impact low risk to politics most of these poachers are not related to any politics agenda	<b>Low</b>	<b>Marginal</b>	Keep continue to conducting Op Kazanah
23	<b>Smuggling (Mil/sy)</b>	Smuggling impact to military and security also low and not critical threats to military because some of smuggler usually prevent to engage with military and other security force	<b>Low</b>	<b>Marginal</b>	Keep monitoring rotating units with other agency to prevent that smuggling.
24	<b>Poachers, Wildlife &amp; Rainforest (Social)</b>	Impact very unlikely to social impact due to PBH will gave a good opportunity	<b>Very unlikely</b>	<b>Significant</b>	Keep monitoring in black market
25	<b>Illegal immigrant (Politic)</b>	Illegal immigrants increasing this impact to local politics gave a unstable of politics the issue a reason of security	<b>Very unlikely</b>	<b>Significant</b>	Enforcement program by all security agencies including spot check to hot area like construction site, market and factory.



26	<b>Illegal immigrant (Environmental)</b>	Men & womens illegally entering this country from whatever reason. Increasing this group of people affected socio economy, uncomfortably by local people & subsequently increases criminal issues.	Low	Uncritical	Enforcement program by all security agencies including spot check to hot area like construction site, market and factory.
27	<b>Human Trafficking (Politic)</b>	Women, men, and children who are victims of human trafficking are subjected to forced labour and commercial exploitation in Malaysia, which serves as both a destination and transit country for these individuals. Create sensitive issues with neighbouring country while there are criminal cases involving their citizen and under judgement of Malaysian Law.	Low	Uncritical	Law enforcement needs more patrols, technology, and intelligence- gathering capabilities.  Bilateral agreement with neighbouring country.  To avoid issues will misinterpret my media and create uncertain condition.
28	<b>Human Trafficking (Mil/Sy)</b>	Women, men, and children who are victims of human trafficking are subjected to forced labour and commercial exploitation in Malaysia, which serves as both a destination and transit country for these individuals. MAF as non-enforcement agency are unable to take any action. These activities may involve with local agent.	Very unlikely	Marginal	Enforcement by all security agency and practise 'undercover' agent involve in this activities.
29	<b>Drug (Politic)</b>	Create sensitive issues with neighbouring country while there are criminal cases involving their citizen and under judgement of Malaysian Law.	Very unlikely	Uncritical	Bilateral agreement with neighbouring country. To avoid issues will misinterpreted my media and create uncertain condition.
30	<b>Smuggling (Environmental)</b>	Smuggling activities affected socio economy like local people business production.	Very unlikely	Uncritical	Enforcement by security agency. Involvement by local people to trace this activities.

Table 5.1: Risk Assessment and action to be taken.  
Source: Develop by researcher

Step 7: Deriving Policies and Plans to Address the Gap

Establish the threats and actions to minimize risk related to probability impact based on 5 factor Barry Busan security element will determine the

needs of Policy for measure to address the gap. **Security policy** is defined as a high-level statement of organizational beliefs, goals, and objectives and the general means to attain the service provided effectively. **Development policy** is programs, policies or activities that seek to

improve the economic well-being and quality of life for a community. It assists communities respond to economic challenges and seize opportunities. Also support collaboration and co-

ordination between neighboring communities. Table 5.2 show deriving policies and plans to address the gap.

No.	Risk	Actions to Minimise Risk	Probability	Severity	Deriving Policy
1	<b>Smuggling (Economy)</b>	Identify the critical hot spot area. Control subsidies goods from smuggling especially connecting route Pan Highway Borneo and Kalimantan focus Border management.	Very High	Disastrous	Security
2	<b>Human Trafficking (Economy)</b>	Organize a get-together with the purpose of increasing awareness in which people will watch films about human trafficking and then discuss them. Examine the ways in which modern slavery is still practised today, see an investigative documentary on gender trafficking, or investigate the ways in which forced labour might affect global food supply chains, for instance.	Very High	Disastrous	Security
3	<b>Poachers, Wildlife &amp; Rainforest (Environmental)</b>	stringent limitations on the domestic trade of ivory, including the prohibition of the selling of ivory over state boundaries and the capping of ivory trophy imports at two items per hunter, once every twelve months. In order to get over these federal limitations, illegal ivory is frequently passed off as antique. East Malaysia only state that must additional regulation prohibitions on top of the federal legislation.	Very High	Disastrous	Security
4	<b>Illegal Immigrant (Economy)</b>	Strengthen the borders. Government and non-government agencies must have cooperation. Where information from civilian to the military or enforcement to act. Modern technologies are helping in patrolling	Very High	Critical	Security

5	<b>Drug (Social)</b>	Gaining information and intelligence are important beside strictly law enforcement. Then educate local people especially in rural area about risk of drug. Learn about the possible side effects of the drugs	<b>Very High</b>	<b>Critical</b>	Security
6	<b>Illegal Immigrant (social)</b>	Imposed heavier penalties onto middleman	<b>High</b>	<b>Disastrous</b>	Security
7	<b>Crime (Social)</b>	Taking into account on public complaints related to matter involving misconduct, corruptions and bribery by closely works with SPRM.	<b>Very High</b>	<b>Significant</b>	Security
8	<b>Smuggling (Social)</b>	The most successful strategies to deter migrant smuggling are law enforcement, educational campaigns, and victim protection. Lawbreakers. The police utilise disruption and deterrents to combat crime.	<b>High</b>	<b>Critical</b>	Security
9	<b>Poachers, Wildlife &amp; Rainforest (Economy)</b>	Wildlife and rainforest with Op Kazanah must coordinate the data and operation but this uncritical to military and police.	<b>High</b>	<b>Critical</b>	Security
10	<b>Human Trafficking (Social)</b>	To avoid issues will misinterpret my media and create uncertain condition.	<b>High</b>	<b>Significant</b>	Security
11	<b>Human Trafficking (Environmental)</b>	The government is taking preventative measures against human trafficking. Tose measures describe a comprehensive, government- wide strategy to combat human trafficking, including initiatives to increase convictions of traffickers, improve victim protection, and prevent the crime from occurring within and beyond our borders.	<b>Possible</b>	<b>Critical</b>	Development
12	<b>Drug (Mil/Sy)</b>	As a result of the fact that drug traffickers are familiar with the strategies used by police, the latter would benefit from having access to the most cutting-edge equipment currently	<b>Low</b>	<b>Disastrous</b>	Security

		on the market to confront new gangs and drug users.			
13	<b>Drug (Environmental)</b>	Decision-makers need to use the Whole of Government (WoG) approach, which consists of multi-party and multi-organizational governments. to deal with the drug that caused environmental pollution and deforestation.	<b>High</b>	<b>Marginal</b>	Development
14	<b>Drug (Economy)</b>	By developing policies, providing preventative education, research, treatment, rehabilitation, and reintegration programmes, developing alternative development initiatives, and coordinating efforts with regional, international, and peer organisations and agencies, individuals can be liberated from the grip of drug addiction.	<b>Possible</b>	<b>Significant</b>	Development
15	<b>Smuggling (Politic)</b>	<p>Law enforcement needs more patrols, technology, and intelligence-gathering capabilities. To eradicate corruption, procedures and personnel must be regularly checked and cycled.</p> <p>The government has increased border patrols, particularly in illegal routes (lorong tikus) regions. Intelligence and operations must be handled with integrity and without ulterior motives for the sake of the nation.</p> <p>The most successful strategies to deter migrant smuggling are law enforcement, educational campaigns, and victim protection. Lawbreakers. The police utilise</p>	<b>Possible</b>	<b>Significant</b>	Development

		disruption and deterrents to combat crime.			
16	Crime (Politic)	Audit check should be made periodically to ensure there is no	Low	Critical	Development
		<p>mismanagement and bribery among the civil and private agencies that involve in the PBH.</p> <p>Taking into account on public complaints related to matter involving misconduct, corruptions and bribery by closely works with SPRM.</p>			
17	Crime (Mil/Sy)	<p>Ensuring the SOP and instructions issued are reviewed and updated frequently.</p> <p>Heavy punishment towards the personnel.</p> <p>Surprise inspection by higher authority or intelligence to ensure the integrity of personnel</p>	Very unlikely	Disastrous	Security
18	Crime (Environmental)	<p>Cooperate with security agencies closely to prevent from happening.</p> <p>Enact Stricker laws and impose heavier penalties on offenders.</p>	High	Uncritical	Development

19	<b>Illegal immigrant (Mil/Sy)</b>	<p>Imposed heavier penalties onto middleman</p> <p>Procuring a higher technology equipment (Radar and UAV) to monitor the possible route used by illegal immigrants</p> <p>Working closely with the civilian to receive information on the likely area used by the illegal immigrant to enter and exit the border</p>	Possible	Marginal	Security
20	<b>Crime (Economy)</b>	<p>Strengthening and equipping the local security agencies and local authorities with latest equipment.</p> <p>Giving Security Agencies and local authorities more power to deal with crimes</p> <p>Increasing the numbers of security agencies and local authorities in the developing area</p> <p>Increasing the numbers of security post in the rural area</p>	Possible	Marginal	Development
21	<b>Poachers, Wildlife &amp; Rainforest (Mil/Sy)</b>	Wildlife and rainforest with Op Kazanah must coordinate the data and operation but this uncritical to military and police.	Possible	Uncritical	Development
22	<b>Poachers, Wildlife &amp; Rainforest (Politic)</b>	Keep continue to conducting Op Kazanah	Low	Marginal	Development
23	<b>Smuggling (Mil/sy)</b>	Keep monitoring rotating units with other agency to prevent that smuggling.	Low	Marginal	Security
24	<b>Poachers, Wildlife &amp; Rainforest (Social)</b>	Keep monitoring in black market	Very unlikely	Significant	Development
25	<b>Illegal immigrant (Politic)</b>	Enforcement program by all security agencies including spot check to hot area like construction site, market and factory.	Very unlikely	Significant	Development
26	<b>Illegal immigrant (Environmental)</b>	Enforcement program by all security agencies including spot	Low	Uncritical	Development

		check to hot area like construction site, market and factory.			
27	<b>Human Trafficking (Politic)</b>	Law enforcement needs more patrols, technology, and intelligence-gathering capabilities. Bilateral agreement with neighboring country. To avoid issues will misinterpret my media and create uncertain condition.	Low	Uncritical	Development
28	<b>Human Trafficking (Mil/Sy)</b>	Enforcement by all security agency and practise 'undercover' agent involve in this activities.	Very unlikely	Marginal	Security
29	<b>Drug (Politic)</b>	Bilateral agreement with neighbouring country. To avoid issues will misinterpret my media and create uncertain condition.	Very unlikely	Uncritical	Development
30	<b>Smuggling (Environmental)</b>	Enforcement by security agency. Involvement by local people to trace this activities.	Very unlikely	Uncritical	Development

Table 5.2: Deriving Policies and Plans to Address the Gap  
Source: Develop by researcher

Step 8: Mitigation and Monitoring of Policy to Threat and Vulnerability. Deriving policy is a final step but need to monitor where is the threats is still relevant to situation or current environment. Type of mitigation are Prevention, Deterrence, Containment, Detection and Reduction and type of monitoring are Baseline, Impact and Compliance (Hempel et al., 2012). The

process of identify risk, matrix risk score needs to be revise back when it came to a new environment or in multi domain. This is because need be sure that the policy are keeping in relevancy to the threats. Table 5.3 show the mitigation and monitoring the threats relevant to policies.

No.	Risk	Deriving Policy	Type of Mitigation	Type of Monitoring
1	<b>Smuggling (Economy)</b>	Security	Prevention	Impact
2	<b>Human Trafficking (Economy)</b>	Security	Prevention	Impact
3	<b>Poachers, Wildlife &amp; Rainforest (Environmental)</b>	Security	Prevention	Impact
4	<b>Illegal Immigrant (Economy)</b>	Security	Deterrence	Baseline
5	<b>Drug (Social)</b>	Security	Deterrence	Baseline
6	<b>Illegal Immigrant</b>	Security	Deterrence	Compliance

	(social)			
7	Crime (Social)	Security	Deterrence	Compliance
8	Smuggling (Social)	Security	Deterrence	Compliance
9	Poachers, Wildlife & Rainforest (Economy)	Security	Deterrence	Impact
10	Human Trafficking (Social)	Security	Deterrence	Baseline
11	Human Trafficking (Environmental)	Development	Deterrence	Baseline
12	Drug (Mil/Sy)	Security	Containment	Impact
13	Drug (Environmental)	Development	Containment	Baseline
14	Drug (Economy)	Development	Containment	Baseline
15	Smuggling (Politic)	Development	Containment	Impact
16	Crime (Politic)	Development	Containment	Compliance
17	Crime (Mil/Sy)	Security	Containment	Compliance
18	Crime (Environmental)	Development	Containment	Compliance
19	Illegal immigrant (Mil/Sy)	Security	Containment	Compliance
20	Crime (Economy)	Development	Detection	Compliance
21	Poachers, Wildlife & Rainforest (Mil/Sy)	Development	Detection	Baseline
22	Poachers, Wildlife & Rainforest (Politic)	Development	Detection	Baseline
23	Smuggling (Mil/sy)	Security	Detection	Baseline
24	Poachers, Wildlife & Rainforest (Social)	Development	Detection	Baseline
25	Illegal immigrant (Politic)	Development	Reduction	Baseline
26	Illegal immigrant (Environmental)	Development	Reduction	Baseline
27	Human Trafficking (Politic)	Development	Reduction	Baseline
28	Human Trafficking (Mil/Sy)	Security	Reduction	Baseline
29	Drug (Politic)	Development	Reduction	Baseline
30	Smuggling (Environmental)	Development	Reduction	Baseline

Table 5.3: Mitigation and Monitoring of Policy to Threat and Vulnerability

Source: Develop by researcher

#### Proposed Model

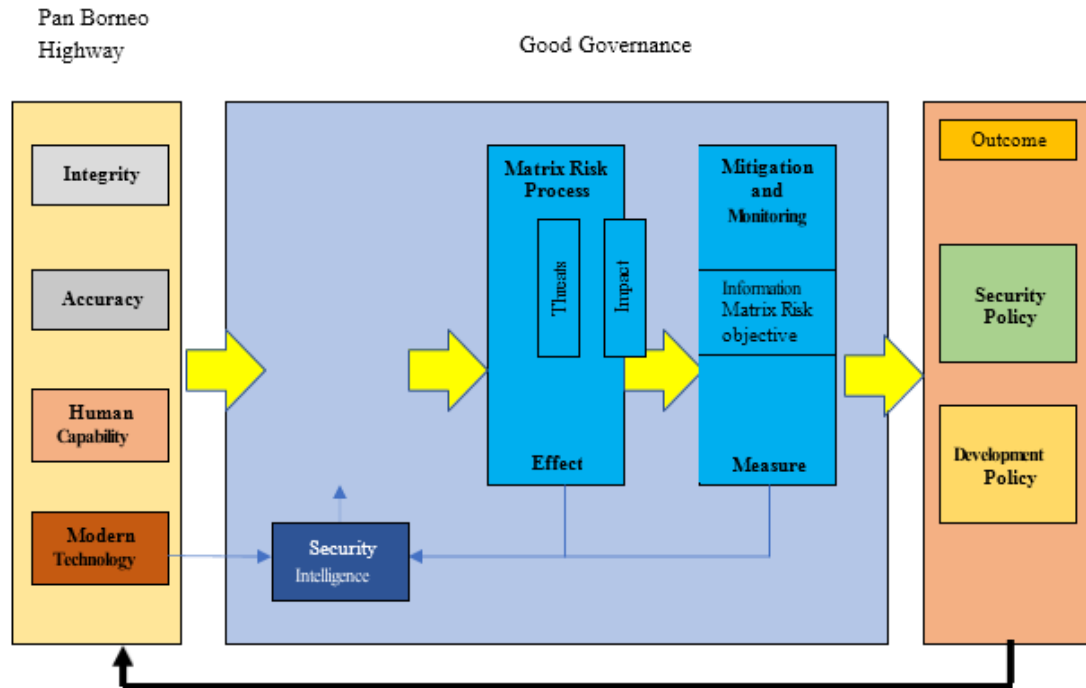
A new model where proposes to analyse of

Security impact where can be use for balancing outcome of security and development concepts (KESBAN). This can be seeing that Pan Borneo



Highway have 4 characteristics Integrity, Accuracy of project, Human Capabilities and Modern Technology were mediator by define the threats, effect of risk process and measure the risk how to mitigate and monitoring will have a good governance give a outcome balance on Security

policy and Development policy that show how KESBAN concept actually works and still relevant in contacts of whole of total defence in National Security. Figure 5.5 show that outcome balance model of KESBAN concept and relevant to SIAM model.



Outcome Balance

<b>Threats</b>
Information NSP 2021-2025
Information Threats
<b>Define</b>

Response: Update Security and Development requirement

Figure 5.5: Outcome Balance Model  
Source: Develop by researcher

### 3. Conclusion

This research to analyse the construction of the Pan Borneo Highway with the goals of Security and Development of social and economic in east Malaysia and improving the level of security in the region. Within the scope of this study, also investigate the construction of the Pan Borneo Highway. However, there are several security and development concerns after the Pan Borneo Highway is established because it will open doors to a type of non-traditional threats, which provides passage within Sarawak and Sabah, including Brunei and Indonesia. These highways will provide passage within Sarawak and Sabah, including both these countries. These initiatives will be necessary to make the highway secure and conducive to the growth and prosperity necessary for future development because the highway will pass through a very large territory. Borneo had impacts, both positive and negative, because of the construction of the Pan Borneo Highway. On the positive side, megaproject, east Malaysia can go to the next intensity of its development, which means that all its resources will be utilized to their fullest potential. As a immediate result, the standard of living of the population will improve, and job opportunities will be made accessible to people in Sabah and Sarawak. Then, the length of the intra-state connections in East Malaysia will be easy to access. Then on negative side, it is unreasonable to change the unfavourable opinions held by the area's residents. SIAM model were used to analyse threat impact to security relevant to Pan Borneo Highway as the results many perspectives were gain on this analysis. First perspective is on

traditional threats base on this Security Impact Analysis traditional threats are lowest impact beside non- traditional threats and its very high impact cause of smuggling, human trafficking, smuggling goods, and poachers. Outcome Balance model were proposed as the outcome of analysis is balance between security and development policy and based on KESBAN concepts. This will give a good monitoring and best way to mitigate the risk. As a result, the government must "to win hearts and minds" of the people to secure their support for the initiative, ensuring economic growth in the future.

### 4. Reference

- Abram, N. K., Lim, H. Y., Ng, C. K.-C., Yorath, S., Razi, M. H. M., Ong, C. G. S., . . . Wilson, K. B. (2022). The socio-economic and cultural impacts of the Pan Borneo Highway on Indigenous and local communities in Sabah, Malaysian Borneo. *PloS one*, 17(6), e0269890.
- Abrullah, M. I. U. (2018). Pan Borneo Highway a game changer for Sabah, Sarawak. In: NST.
- Akob, Z., Hipni, M. Z. A., & Abd Razak, A. A. (2019). Deployment of GIS+ BIM in the construction of Pan Borneo Highway Sarawak, Malaysia. *IOP Conference Series: Materials Science and Engineering*.
- Buzan, B., Buzan, B. G., W'ver, O., Waever, O., & Buzan, O. W. B. (2003). *Regions and powers: the structure of international security* (Vol. 91). Cambridge University Press.
- Dollah, R., Hassan, W. S. W., Peters, D., & Othman, Z. (2016). Old threats, new approach and national security in Malaysia:

- issues and challenges in dealing with cross-border crime in east coast of Sabah. *Mediterranean Journal of Social Sciences*, 7(3 S1), 178-178.
- Douglas, N., & Douglas, N. (1999). Towards a history of tourism in Sarawak. *Asia Pacific journal of tourism research*, 4(1), 77-86.
- Eilenberg, M. (2012). Territorial sovereignty and trafficking in the Indonesia–Malaysia borderlands. *Labour migration and human trafficking in Southeast Asia: Critical perspectives*, 112-129.
- El-Muhammady, A. (2021). Malaysia: Balancing national development, national security, and cybersecurity policy. In *Routledge Companion to Global Cyber-Security Strategy* (pp. 325-336). Routledge.
- Hempel, L., Ostermeier, L., Schaaf, T., & Vedder, D. (2012). SIAM.
- Hitchner, S. L., Apu, F. L., Tarawe, L., Galih@Sinah Nabun Aran, S., & Yesaya, E. (2009). Community-based transboundary ecotourism in the Heart of Borneo: A case study of the Kelabit Highlands of Malaysia and the Kerayan Highlands of Indonesia. *Journal of Ecotourism*, 8(2), 193-213.
- Ikau, R. A., Rashid, A., Muhammad, W., & Wahi, N. (2019). A preliminary study of safety management practices on Pan-Borneo highway construction sites in Kuching, Malaysia. *Journal of Physics: Conference Series*,
- Mat, N. A., Mansur, K., & Mahmud, R. (2015). The relationship between human capital investment and economic development in Sabah. *Malaysian Journal of Business and Economics (MJBE)*.
- Redzuan, A. F. B. (2019). Perception of The Contractors On Collaborative Relationship in Pan Borneo Project.
- Sloan, S., Campbell, M. J., Alamgir, M., Lechner, A. M., Engert, J., & Laurance, W. F. (2019). Trans-national conservation and infrastructure development in the Heart of Borneo. *PloS one*, 14(9), e0221947.
- Wong, S. C., Chew, P. S., Chew, Y. T., Mok, J. Y., & Sim, S. Y. (2017). Regional Development of Specification and Employment Developmant in Sabah and Sarawak: An Analysis with Shift Share Techniques [UTAR].
- Zulkifli, N. (2022). Pan Borneo Highway: Impact Towards National Security of Sarawak, Malaysia. *International Journal of Science Academic Research*, Vol. 03, Issue 03(pp.3540-3546).