
IMPROVING OUTCOMES OF
MAJOR INFRASTRUCTURAL
DEVELOPMENT IN SABAH:
FINDINGS FROM A CASE
STUDY OF THE
PAN BORNEO HIGHWAY

LEAP - FOREVER SABAH



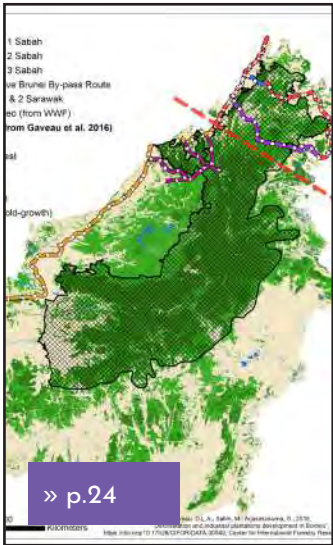
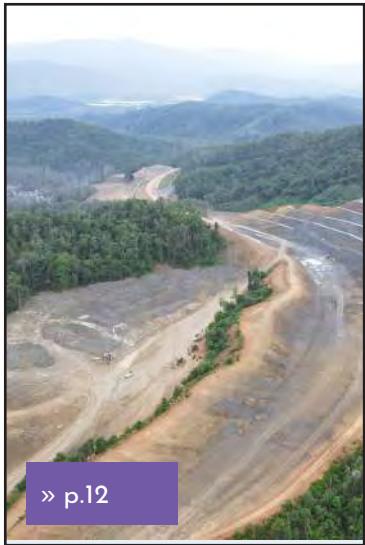


Tawai Class 1 Protection Forest Reserve in the heart of Sabah, forming the water catchment area for Telupid town and featuring the magnificent Tawai waterfall (the 2nd highest waterfall in Sabah).
The current proposed route of the Pan Borneo Highway will dissect this unique ecosystem.



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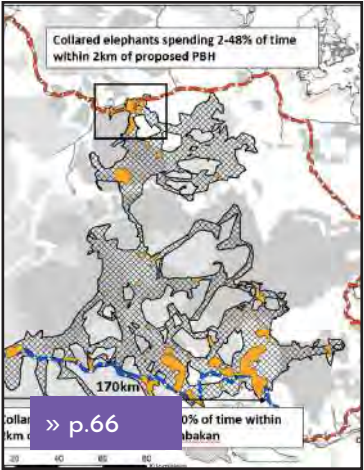
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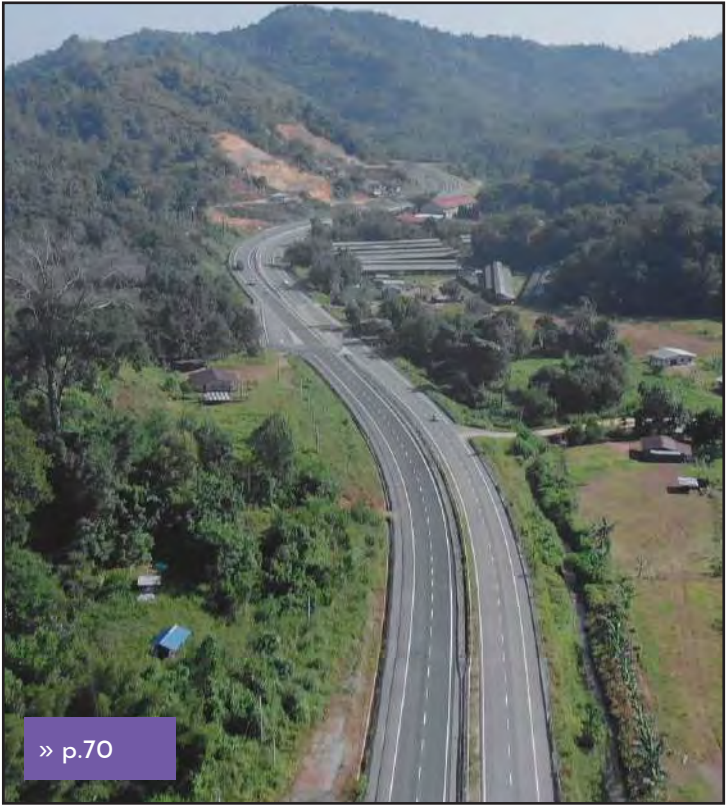
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1. INTRODUCTION & INTENTIONS

This report presents key findings from a four-year Humans Habitats Highways (HHH) initiative that explored ways for improving the outcomes of infrastructure development, with the Pan Borneo Highway (PBH) serving as a case study. Our aim is to highlight ways for the government, private sector, civil society and other stakeholders to collaborate more effectively towards improving outcomes for communities, the environment and the state.

Over the course of four years this initiative has:

- Developed Coalition 3H (comprising ten local organizations) as a platform for effective engagement in infrastructure development in Sabah;
- Gathered reliable information from researchers, local communities and the relevant agencies to map and properly understand how to reduce negative impacts of infrastructure development, especially in selected sections of the PBH
- Engaged Sabahans in infrastructure development issues, working in film, social media, the press, youth and public forums and student field studies; and
- Initiated multi-stakeholder processes between government, private sector, and civil society to better align infrastructure development with Sabah's sustainable development goals.

The findings from this work are shared in the spirit of responsibility and relationship. They have arisen equally from careful studies of satellite data and documents as from debates among Sabahans from all walks of life. Outreach and advocacy were central to the HHH discovery process, both for understanding the actual issues and the facts, and for working out how we could better work together to improve outcomes for Sabah. Not surprisingly, all stakeholders bring unique knowledge and solutions to the table. No "scientific" finding here was not improved by discussing it with those with practical knowledge of the situation on the ground. And suggestions from all directions - including private, government and community - and coming from teenage students to leading civil servants have found their way into these findings and recommendations.

We believe the Sabah State Government has an opportunity to build a legacy based on sustainability and equity. Sabah is well known for policies and mandates that favour long term sustainable use of its resources, some of which have earned accolades globally. It is also known for deliberating upon input from civil society and the private sector in deciding how to proceed with critical infrastructure projects.

In the case of PBH, we urge the Sabah Government to look for lower impact alignments, and to open the doors for open consultative planning with civil society and the relevant local communities. It is not too late to review alignments for certain sections of the PBH within Phase I, and this is the right time to have careful reviews of the plans for Phases II and III.

We also hope this project provides a precedent and methodology that may encourage other governments, consultants, researchers, and civil society, both regionally and globally, to engage creatively with large-scale infrastructure development projects to improve social and environmental outcomes.

2. HHH PROJECT BACKGROUND & ACTIVITIES

The project commenced in 2017 as HUMANS HABITATS HIGHWAYS (HHH) with a team from LEAP and Forever Sabah (FS) comprising individuals with experience in facilitation, communications, administration, biodiversity conservation, geospatial science, engineering and environmental law.

We agreed to focus on the PBH as an example of major infrastructure that has profound social, environmental, economic and developmental impacts, both positive and negative.

HHH worked with James Cooke University (JCU), Australia from 2017-2018 in tandem with their project “Limiting Environmental Impacts While Optimizing Benefits of Rapid Road Expansion in the Asia-Pacific Region”.

We then expanded and strengthened to COALITION 3H in early 2018 – as an advocacy grouping of research institutions, conservation NGOs and civil society organisations comprising Borneo Futures, Bornean Sun Bear Conservation Centre, Danau Girang Field Centre (DGFC), Forever Sabah (FS), Jaringan Orang Asal SeMalaysia (JOAS), LEAP, PACOS Trust, Seratu Aatai, and WWF Malaysia Sabah; Save Rivers, from Sarawak joined in 2020.

HHH engaged with diverse stakeholders in this work, developing collaborations with the Sabah Environment Protection Department (EPD), Sabah Forestry Department (SFD), Sabah Wildlife Department (SWD), Sabah Public Works Department (PWD), the former PBH Project Delivery Partner Borneo Highway PBP Sdn Bhd, Institute for Development Studies Sabah (IDS), Telupid Community Elephant Ranger Team (CERT) and various local communities. We developed a strong partnership with University College Sabah Foundation (UCSF).

The initiative prioritized the following hotspots on the PBH where social and environmental impacts would be most significant:

- Work Package 5 (Papar)
- Work Package 10 (Pituru – Rampayan Laut)
- Work Package 22-27 (Kinabatangan/Segama)
- Work Package 31 (Telupid/Tawai Forest Reserve)
- Work Package 33 (Taviu Forest Reserve)
- Southern area (Kalabakan – Sapulut)

We also examined the legal and policy aspects of infrastructure development in Sabah, including the Sabah Structure Plan 2033, the Serusup Environmental Impact Assessment process and the need to broaden *locus standi*.

New NGO group to assess Pan Borneo

KOTA KINABALU: Non-government organisations with social and environmental justice as well as research missions have formed Coalition Humans Habitat Highways (3H). The aim is to provide a platform for civil society, academia and the public to engage proactively in road and infrastructure development planning and processes, through science, information access, online dialogue, community workshops, forums and site expeditions.

Coalition 3H comprises Bornean Sun Bear Conservation Centre (BSBCC), Borneo Futures, Danau Girang Field Centre (DGFC), Forever Sabah, Jaringan Orang Asal Se-Malaysia (JOAS), Land Empowerment Animals People (LEAP), PACOS Trust and WWF-Malaysia.

It said, Malaysia, along with Indonesia and Papua New Guinea, is planning some of the most intensive road and infrastructure expansions in the tropical world over the next two decades. Sabah and Sarawak will see their share of this, including the highly promoted Pan Borneo Highway.

Roads, highways and bridges can be beneficial pathways to progress, equality and prosperity. They can also be harmful trails of destruction impacting the integrity of landscapes, cultures and economies. The difference lies in how they are planned. Robust discussions and open decision-making processes, relevant research studies and assessments, and collaborative engagement between public, private and civil society sectors can make this difference and help us find ways forward that optimise benefits and limit

risks, it said.

Coalition 3H is partnering with both local and international research institutions, namely Universiti Malaysia Sabah and James Cook University's (JCU) Centre for Tropical Environmental and Sustainability Science. The first focus will be on a Strategic Collaborative Assessment of the Pan Borneo Highway.

The Coalition is also engaging with professionals in the design, engineering and construction fields as well as the appropriate government agencies and local government bodies.

To lay the groundwork, multiple well-attended meetings and workshops across the sectors were held, and courtesy calls were made on government agencies such as the Environment Protection Department, Town and Regional Planning Department, the Sabah Forestry Department, the State Economic Planning Unit and the Ministry of Tourism, Culture and Environment.

Cynthia Ong, Executive Chairperson of LEAP and lead facilitator of the Coalition said, "We requested to meet with the Chief Minister, the Minister of Infrastructure Development and JKR since last year and were not able to meet, inform and get feedback from them. This is important to us as it is our intention to interface with the key government bodies in an open and professional manner."

"We want to shift our approach by organising and channelling our concerns as early as possible in the planning process, and harnessing the collective contributions of our partners towards achieving a sustainable landscape, particularly in

areas designated as 'Environmentally Sensitive' in the Sabah Structural Plan 2033," commented Dato' Dr. Dionsysius Sharma of WWF-Malaysia.

Coalition 3H partners Anne Lasimbang, Executive Director of PACOS Trust and Beverly Joeman, Secretariat Director of JOAS chorused, "We see and acknowledge the efforts made by the proponents and the builders of the Pan Borneo Highway to inform the public and communicate progress; we also track the concerns and criticism raised by some indigenous peoples and local communities and groups. The Coalition will bring useful studies, research findings and community consultations to help bridge gaps and promote informed discourse."

Several analyses are planned for the year ahead, focusing in on various stretches and particular alignments of the Pan Borneo Highway. These will be shared widely via scientific journals, social media, print and online media, workshops and forums. They will also consider financing as well as local, national, regional and international policies and laws.

Dr. Benoit Goossens, Director of DGFC and Reader at Cardiff University and Dr. Marc Ancrenaz, Coordinator of Borneo Futures said, "There is extensive data from decades of research by many local and international institutions, including on wildlife, habitats, forests, hydrology, geology, fisheries, agriculture, and socio-economics. We want to contribute this to strengthen and open up the planning and decision making processes for road and infrastructure development."



Environmental NGOs form Coalition 3H

Borneo Post 5/5/18 pg 13

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Cynthia Ong



Dr. Benoit Goossens



Anne Lasimbang



Beverly Joeman

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"We want to contribute to strengthen and open up the planning and decision making processes for road and infrastructure development."

3. UNDERSTANDING THE CONTEXT: THE PAN BORNEO HIGHWAY & INFRASTRUCTURE PLANNING IN SABAH

(i) STAKEHOLDER DIALOGUES

To better understand the context HHH held a series of consultations in 2017 and 2018 with the stakeholders, leading up to an important workshop and a dialogue co-organised by Coalition 3H and the Institute for Development Studies Sabah (IDS), an independent think tank and research institution that advises the Sabah Government.

The workshop in March 2019 A Systems Approach to Infrastructure Development - the PBH case, gathered stakeholders from government, civil society, and the private sector, including the PBH, PDP and EIA consultants to consider a 'systems approach' to government policies and infrastructural development. There was extensive press coverage of the event including interviews with Coalition 3H members, highlighting concerns about unnecessary ecological and social impacts of the PBH.

In October 2019 we followed up with a convening entitled "Inclusive Dialogue on Infrastructure Development in Sabah for the 12th Malaysia Plan", attended by over 100 participants from both the state public sector and civil society, including experts and academics, as well as representatives from local communities. A report of the dialogue was sent to the then Sabah Chief Minister, Sabah Minister of Infrastructure Development, the Assistant Minister of Tourism, Culture and Environment and the Director of Sabah Economic Planning Unit, with a request for meetings with each of the recipients.



dailyexpress

YOUR LOCAL VOICE | THURSDAY, OCTOBER 24, 2019

Take charge of Sabah's growth ourselves: Minister

David Thien

KOTA KINABALU: Sabahans should play an active role in the State's development without relying too much on others, including the Federal Government.

"The Sabah Government does not belong to the Chief Minister. Sabah does not belong to the Ministers only," said State Assistant Tourism, Culture and Environment Minister Assaffal Alian.

He urged NGOs to voice out their concerns as the State Government is open to constructive suggestions, ideas and criticisms.

"The days when only one person or leader knows what's best is over," Assaffal said at the dialogue between stakeholders on Infrastructure Development in Sabah for the 12th Malaysia Plan organised by Institute of Development Studies (Sabah) in collaboration with Coalition 3H Tuesday.

Acting IDS Chief Executive Officer Anthony Kiob in his address said the objectives are to provide a platform for effective dialogue and understanding of current information and policies from key players; and to explore the establishment of an all-inclusive Joint Action Committee that reviews infrastructure projects in Sabah.

"Infrastructure development has become an increasingly important growth engine that can stimulate demand, create jobs, increase productivity and promote

inclusive growth.

"Efficient transport and logistics are crucial for our economic growth.

"Infrastructure is the lifeline of the economy. Adequate infrastructure enables all economic activities to be executed efficiently, smoothly in time and positioned the economy on a high note.

"It generates and fosters growth. First-rate infrastructure forms the backbone of any developed economy in the world," said Assaffal.

He defined infrastructure as the network of power, telecom, ports, airports, roads, civil aviation and railways.

"Road transportation remains one of the most important types of infrastructure in Sabah. Roads are the means by which the movement of people and goods from one place to another is ensured.

"People move out of their houses every day to reach their places of work, trade or business daily.

"They use roads and vehicles available to them. They not only generate income from working but also fulfil the needs of needs of others and it also determines where we live."

In his speech, Anthony Kiob said: "Infrastructure has been identified as the key to the success of Sustainable Development Goals (SDG).

"Infrastructure is covered under SDG



(From left) Kiob, Assaffal and co-organiser Cynthia during the dialogue.

Nine (SDG9), which is, 'build resilience infrastructure, promote inclusive and sustainable industrialisation and foster innovation'.

"Infrastructure development can place enormous pressures on natural resources and ecosystems.

"The choices that we make about the types and the place of infrastructure and how it is planned, designed, constructed, operated and maintained have significant impacts on both society and the environment.

"Inclusive infrastructure will be the theme for the coming Workshop by the United Nations (UN) Environment and UN Office for Projects Services (UNOPS) in Geneva, next month.

"Infrastructure systems are drivers of economic growth, and enable access to basic services and economic opportunities to improve livelihood and well-being.

"Transportation and telecommunication systems can enhance social inclusion through improved connectivity to health-

care, schools, jobs and other services, while access to water is contingent to food production, human health and wellbeing.

"Infrastructure development is also the foundation for the development, essential for eradicating poverty, and key to realization of all human rights and fundamental freedom," Anthony Kiob said, adding that the dialogue is timely and relevant as the Sabah government is now preparing the 12th Malaysia Plan and participants can contribute inputs by providing solutions, recommendations and directives where possible.

"The 12th Malaysia Plan will be aligned with the shared prosperity initiative encompassing three dimensions of economic empowerment, environmental sustainability and social re-engineering," he said.

Among the strategies under the the 12th Malaysia Plan for Sabah include the implementation of the existing and new high impact projects as a catalyst for the State's development.

Key Issues and Recommendations from the October 2019 Dialogue:

Key Issue 1: There is a demand and need for greater transparency, access to information and public participation in higher-level policy and planning processes in Sabah.

- o Recommendation: The State Economic Planning Unit (UPEN) engages civil society participation in the Inter-Agency Planning Group (IAPG), including for RMke12. Alternatively, a joint committee is formed between government agencies and civil society groups to meet periodically to discuss infrastructure issues and share information.

Key Issue 2: Social and environmental impact assessments (SIAs and EIAs) are important tools but are not designed to sufficiently address social and environmental concerns in proposed projects.

- o Recommendation: Propose reforms to project planning and environmental protection processes to enable access to information and public participation at the early stages of proposed projects, and require feasibility studies and cost-benefit analyses (done holistically, taking into account all externalities and not just the construction costs) before projects are designed and subject to impact assessments.

Key Issue 3: Open dialogues are important platforms for information sharing and public participation, yet are rarely organised.

- o Recommendation: Organise more such dialogues for various government agencies, diverse rights-holders and stakeholders to come together, share ideas and information, synergise and prepare bottom-up inputs to government processes.

The Tuaran - Kudat stretch of the PBH which cuts through Forest Reserves near the coast and the Kota Belud Bird Sanctuary



(ii) BACKGROUND TO THE PAN BORNEO HIGHWAY (PBH)

The PBH is a long proposed major infrastructure project to upgrade road connectivity in Sabah and Sarawak and with the rest of Borneo. The current project was first announced in 2013 as part of the then ruling party's election manifesto for the 13th general election. Following the party's return to power, PBH was then confirmed as a federal government project to be carried out in three phases in Sabah totaling 1,236km, with the cost for Phase 1 (706km) reported at RM12.86 billion.

The original plan mostly involved widening existing roads from two lanes to four lanes, together with a completely new two-lane road up the coast of northwest Sabah, touted as Sabah's Gold Coast. According to government statements, the PBH will "not only offer faster, safer and more comfortable road connectivity to the people, but also provide more efficient infrastructure and logistical network for small and medium enterprises (SMEs) throughout the State" as well as boosting trade, connectivity and tourism between Sabah and Sarawak and potentially with Kalimantan. The road will also link several marine, palm oil, manufacturing and oil and gas clusters around Sabah and be toll-free.

Much of the political focus on the PBH is around the fact that this is a way to bring significant federal funding to Sabah, returning money that Sabahans typically see politically as having its origins in the state's natural resources. Therefore, critiques or delays to the PBH process are felt as an act of injustice to Sabah that undermine the capacity of its political leadership to distribute financial opportunity and development. Clearly, Sabah needs to press for changes in how resource revenues are allocated between state and federal agencies, and around how it receives Federal allocations. Such changes could mean these funds are channeled according to Sabah's actual priorities, and timetables for projects of a wider range of sizes and purposes, and also for maintenance costs.

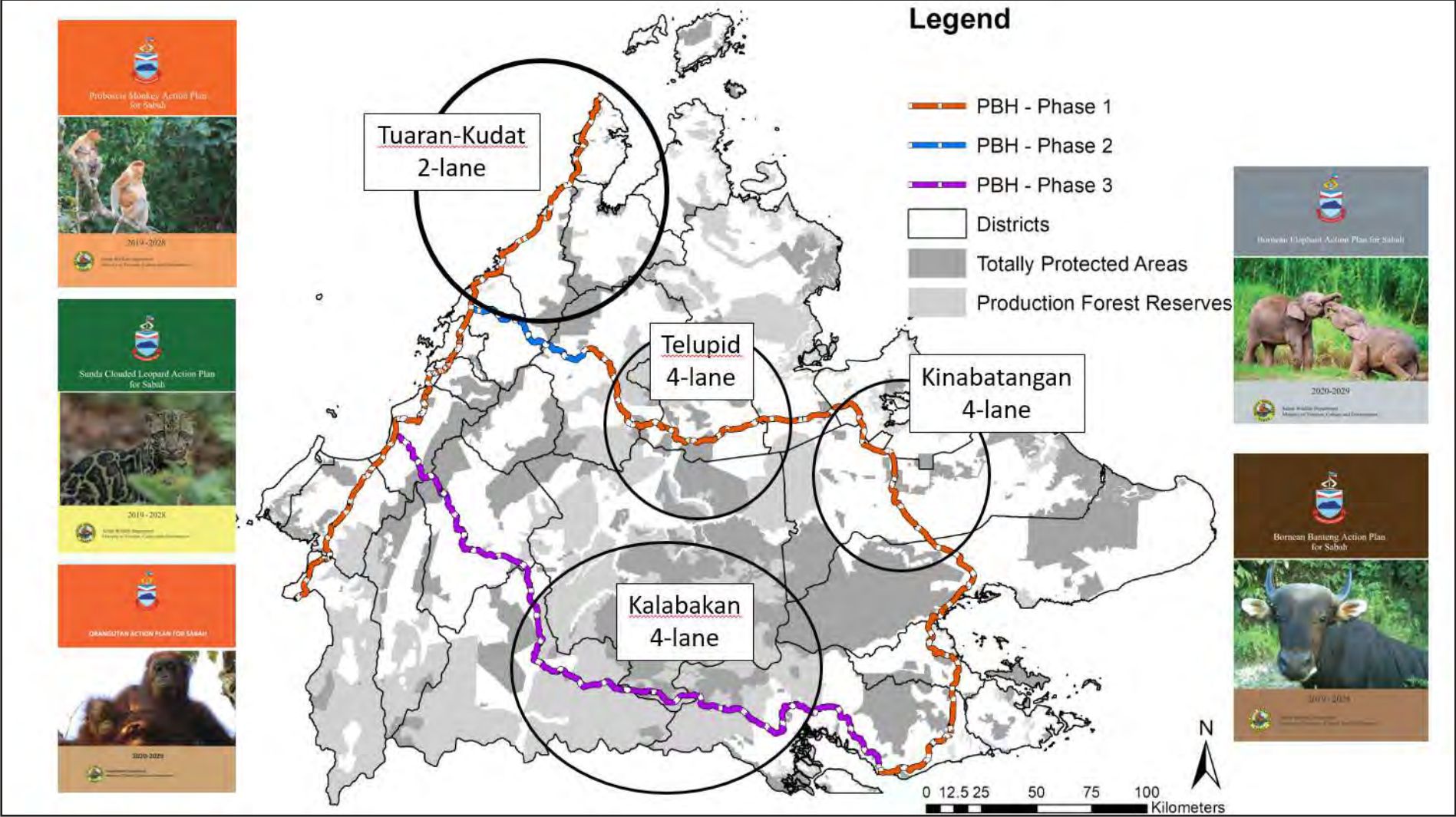
Originally carried out under a Project Delivery Partner arrangement, the Public Works Department took over responsibility for construction in September 2019. A Project Management Consultant HSS Engineers Bhd was then appointed the Project Management Consultant for Phase 1 of the PBH in April 2021, to undertake the 63-month works which include administration and supervision management, at a cost of RM144.9 million.

PHASE 1 comprises 35 Work packages and was launched on 24th April 2016. It covers Sindumin - Kota Kinabalu- Kudat and Ranau-Mile 32 Sandakan - Tawau, and was initially scheduled to be completed by the end of 2021. As of April 2021, according to the Federal Senior Minister of Works Datuk Seri Fadillah Yusof, 11 out of the 35 packages were being implemented and were 49% completed, while five were under the tender process and expected to begin construction this year. The cost for 15 out of the 35 packages currently amount to RM7.075 billion. The expected completion date is now 2024.

PHASE 2 of the PBH (98km) is to link Tamparuli near Sabah's west coast with Ranau in central Sabah, while PHASE 3 (432km) runs from Tawau on Sabah's southern coast right across to Komanis on Sabah's west coast, via Kalabakan, Keningau and Tenom. Construction has not started on both phases.

OVERALL FINDINGS ON PLANNING ISSUES AROUND THE PAN BORNEO HIGHWAY (PBH)

- Despite Sabah's sustainable development policies, including the Sabah Structure Plan 2033, implementation of the PBH little integrates environment and development priorities.
- The PBH was planned without studies of how to maximise benefits and minimise socio-economic and environmental costs, and without using the knowledge of Sabah's civil society organisations, local communities, private sector and researchers that could improve design and outcomes.
- One consequence is the lack of joined up thinking for the PBH. For example, the Serusup-Simpang Mengayau section is being built to develop tourism but is unintentionally destroying the mangroves, water quality, fisheries, beaches and wild species upon which tourism there is based; the Papar section is running through paddy fields cutting across the state's commitment to improving rice self-sufficiency; Malaysia is planting 100 million trees to tackle climate change while running PBH through forest reserves and wetlands.
- Lack of access to information about the PBH, including alignments and the EIA documents, means the public only learn the details too late to make useful inputs.
- Availability of federal funding for construction is not matched by on-going funding for adequate maintenance; thus the new PBH may soon have the same challenges as existing roads.

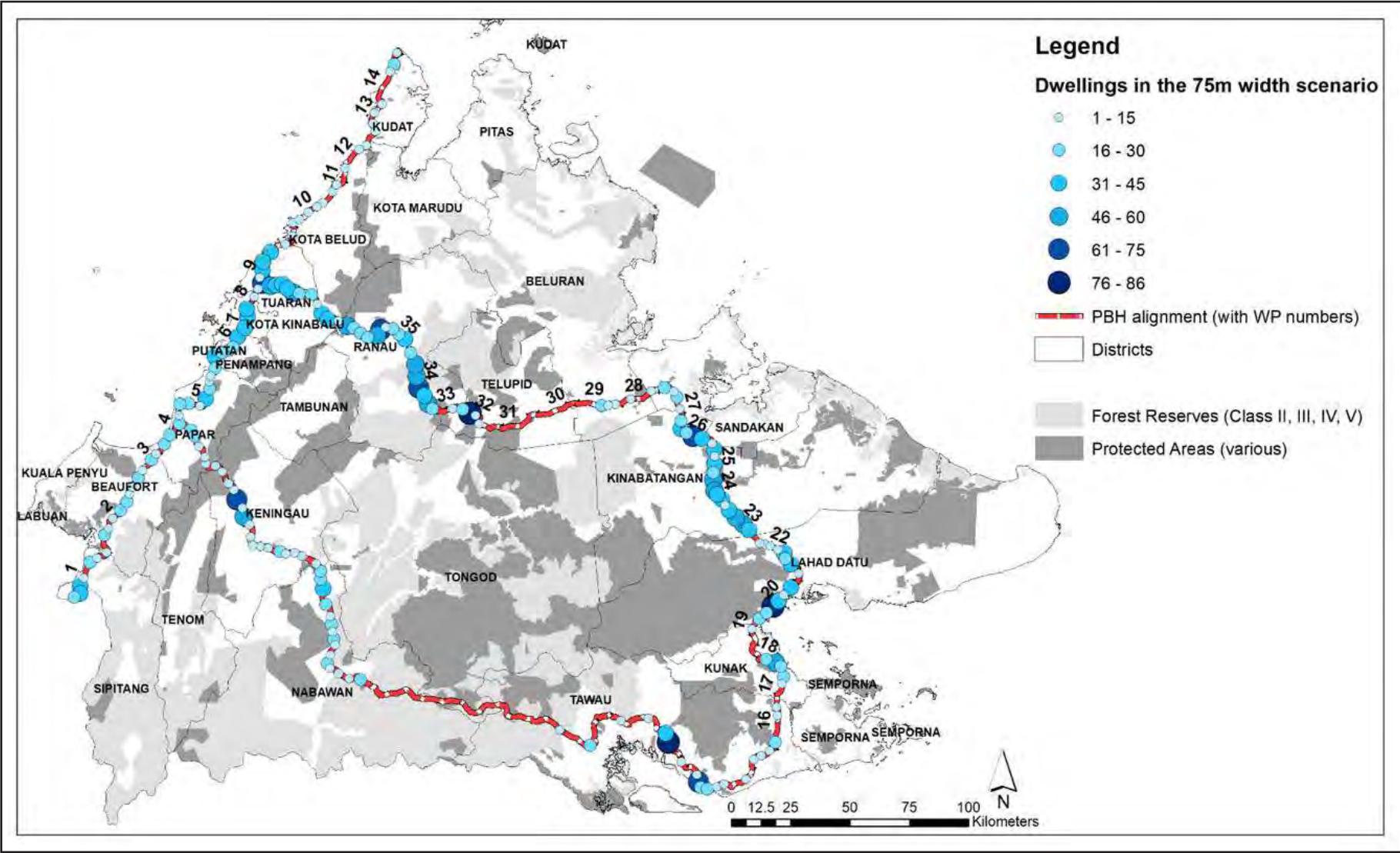


As well as georeferencing maps from EIA documents and overlaying with Protected Area data and information from high resolution satellite images, PBH maps have been digitised and combined with species data from Coalition members.

4. REDUCING VILLAGE DISPLACEMENT BY THE PAN BORNEO HIGHWAY

Historically, Sabah has been starved of road and other critical infrastructural investment such as reliable water supply to households. This has been a significant constraint on the state’s social and economic development. This much needed investment in roads, however, needs to be planned in a careful, holistic and consultative way, if the benefits are to be maximized and to avoid unintended negative consequences. Furthermore, failure to secure funding for maintenance also has negative consequences when these roads fail to serve their purpose for those who were initially promised connectivity to nearest towns to market their produce, and for other travel needs.

A key challenge for the PBH is that feasibility studies were not undertaken at the design stage to measure and optimise socio-economic benefits and minimize social costs, meaning that the engineers did not have the data available to consider socio-economic impacts when they selected the routings.



Digitised alignment of the PBH of the Pan Borneo Highway (red and white line) in Sabah showing the number of dwellings (by range in blue dots) that may be demolished within the 75m width scenario for the PBH. The grey areas are within Sabah’s Protected Areas (dark grey) and Production Forest Reserves (light grey).

(i) THE LEGACY OF RIBBON DEVELOPMENT & PROBLEM OF ROAD WIDENING

In the case of the PBH, the largest unintended social problem comes about because most villages are long lines of houses and lands along both sides of the roads that were built around Malaysia's independence. Therefore, rather than benefiting local people as expected, the widening of the existing road to four lanes with a central reservation and large verges will displace many of the villagers and require compulsory acquisition of their lands. As explained by one of the Sabahans consulted under this initiative, Noormala Anwar from Segaliud, who will lose the home she has lived in for 30 years without compensation, as well as her community and livelihood, "If the government aims to upgrade the development of the state of Sabah with roads, they should also upgrade the livelihood of its people".

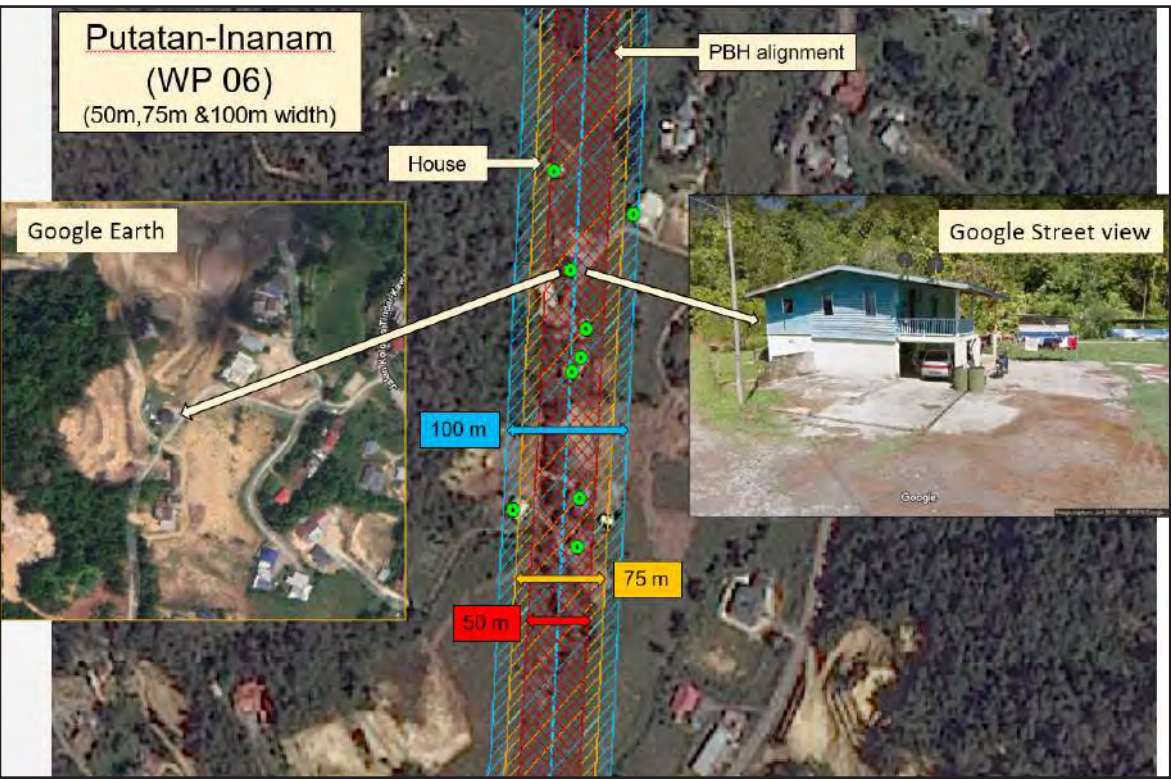
Forced displacement viewed as a material issue to be resolved with compensation money is too limiting. This emerged strongly from outreach and public dialogues. Human wellbeing is linked to place, memory, and social and ecological ecosystems which may be damaged by displacement in ways that money cannot compensate, and which time does not quickly heal. This is especially true for indigenous communities.

In regards to the current PBH routings, only minimal attention has been given to displacement impact, and no estimates of the number of buildings and communities that would be lost were developed to guide routing decisions. This means that many communities that first welcomed the PBH later become distressed when it became clear from the bulldozers that they would themselves be removed by the road they hoped would bring them development.

To help address this lack of information, HHH assessed the impact of the PBH in terms of human displacement, to soon be published as: *The Socio-economic and Cultural Impacts of the Pan Borneo Highway on Indigenous and Local Communities in Sabah, Malaysian Borneo* using three width scenarios (50m, 75m, and 100m) for the road corridor. (The average width of what has been built so far is around 80m).

FINDINGS

- It was estimated that 65-93 villages will be impacted, 1,712-7,093 homes may be demolished, and between 3,420 ha - 6,695 ha of community lands (paddy, oil palm smallholdings, rubber, orchards etc.) could be lost to the highway.
- Furthermore, due to complex land issues, potentially only 25%-30% of households may get compensation for the loss of their houses, and thousands may not get compensation for the loss of their lands. Interestingly it was also found that the highway will disproportionately impact five indigenous groups, with the Kadazan Dusun most likely the hardest hit.
- In addition, in at least three locations (Sipitang, Papar and Kota Belud) the PBH cuts through areas of wet paddy, with disruptions to irrigation and rice harvest already being felt. Areas of smallholder rubber and oil palm will also be affected by loss of land to the PBH, as will many roadside stalls and cafes, which are important sources of income to local communities.
- The emotional trauma of being ousted from one's home and lands will also likely be considerable. For example, displacement may desecrate culturally important areas, and scatter kinship groups and families, thereby weakening culture and social networks and systems. This may be felt more by indigenous communities, and especially women and children. Numerous long-term studies of development-related displacement demonstrate increases in landlessness, joblessness, homelessness, marginalisation, food insecurity, substance abuse, increased morbidity and mortality, loss of access to common property, and social disintegration, even across generations.
- For those individual villagers who are spared displacement, they may be left in a village that has lost so many of its residents that it is no longer large enough to warrant government and commercial services.
- Furthermore, the legacy of ribbon development (the building of dwellings alongside roads) may mean that many villages will now span both sides of the 4-lane high-speed highway. It will therefore become dangerous to move around the village to visit relatives, go to school and local shops, especially for children and the elderly.
- Even villages not directly affected may be impacted by making space for displaced community members (e.g. parents, grandparents, village elders), who have lost homes and lands and therefore livelihoods, social networks and cultural identity in their home villages.

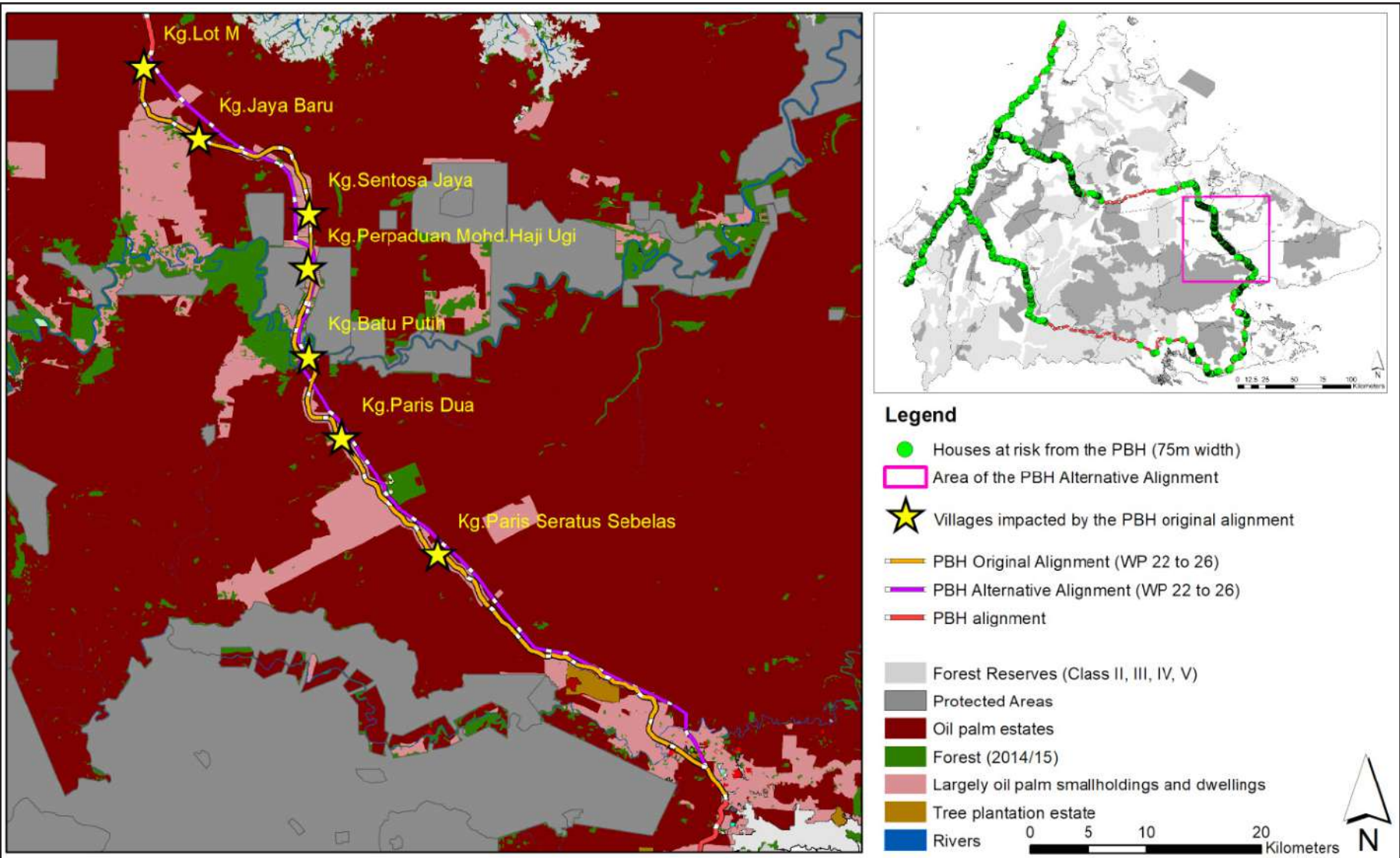


	Dwellings in 50m width	Dwellings in 75m width	Dwellings in 100m width
All phases	1,712	4,372	7,093
Phase 1 (750 km)	1,233	3,006	4,851
Phase 2 (83 km)	292	628	867
Phase 3 (394 km)	187	738	1,375

TOP LEFT: Demolished dwelling due to the PBH.
TOP RIGHT: For this study, 50m, 75m and 100m scenarios were used to estimate the PBH width, in order to then count the number of dwellings within each scenario (see green dots). To do this, high resolution (1.5m) imagery, Google Earth and Street view were used.
BOTTOM CENTER: Table showing the number of dwellings identified within the three PBH width scenarios.

(ii) FINDING ALTERNATIVE, LOWER IMPACT PBH ALIGNMENTS FOR THE KINABATANGAN/ SEGAMA REGION

In order to demonstrate the possibility of lower impact routes for communities, we identified an alternative alignment for the eastern section of the PBH comprising five Work Packages (WP 22, 23, 24, 25 and 26) in the Kinabatangan and Segama region (see maps below). These Work Packages were selected because construction has not yet been started and the surrounding landscape is fairly flat and homogenous for the engineers.



Map showing the area of the proposed PBH alternative alignment in the existing Kinabatangan bridge area, with the PBH's original alignment (orange and white line) and the alternative alignment (purple and white line) along with large areas of oil palm estates (dark red), protected areas/forest reserves (dark grey and light grey), unprotected forest (dark green), and community lands (largely Native titles) that contain homesteads and oil palm smallholdings (pink) and village locations (yellow stars) and names.

If the PBH follows the alternative alignment, there will be a number of positive impacts:

- It will be just under 8km shorter (and therefore cheaper and quicker).
- The alternative alignment will largely go through oil palm estates, following the current electricity pylon track.
- As a result, the number of dwellings lost (and families displaced) is significantly lower with only between 11 and 59 dwellings potentially impacted (between the 50m to 100m width scenario), as opposed to 236 to 1,222 dwellings (between the 50m to 100m width scenario) under the government's current plan.
- It will also avoid displacing entire villages (e.g. Sentosa Jaya, Batu Putih, Paris Dua, and Paris Seratus Sebelas).
- With the alternative alignment the current 2-lane road will still be functional for the communities to use.
- There will be less risk of fatalities and injuries of the communities due to the PBH being (largely) away from community areas.
- Traffic will suffer less congestion caused by local community use of the road in these village areas.

RECOMMENDATIONS

- We urge government to identify alignments that have lower impact on communities, particular in the high displacement zones identified by the HHH Map
- Government should compensate equitably when displacement cannot be avoided, including for buildings and other improvements made by long-term residents with NCR but without title. Engagement with civil society and impacted communities can assist this process.

5. REDUCING ENVIRONMENTAL IMPACTS OF THE PAN BORNEO HIGHWAYS

(i) BETTER ROUTING TO AVOID HOTSPOTS

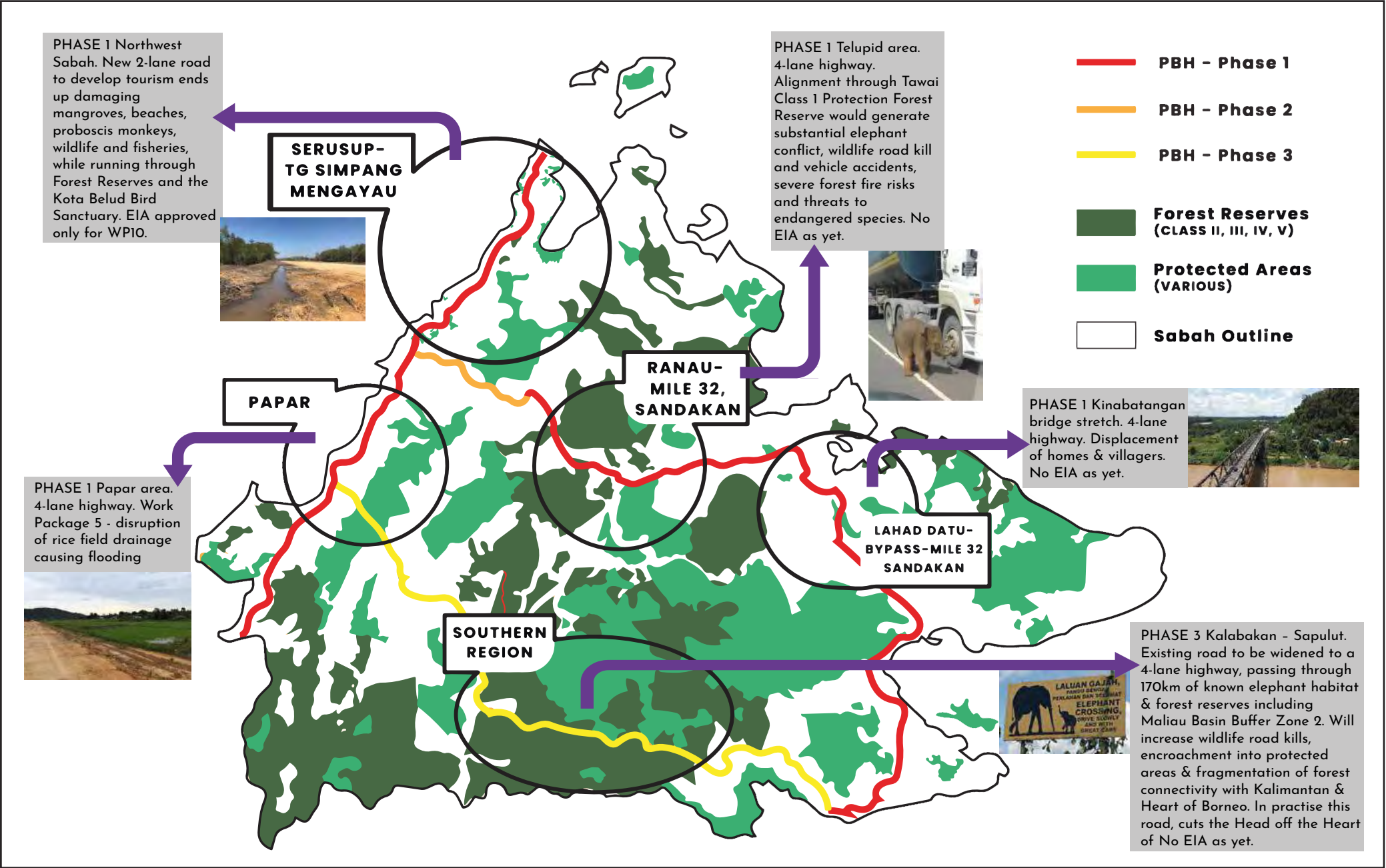
The HHH Team, together with Coalition 3H members and other partners, have identified a wide range of environmental impacts generated by the PBH, many of which could be readily solved by better route planning, mitigation and enforcement of Environmental Impact Assessments and other environmental law (see inset).

Meanwhile HHH worked with its partners to identify hotspots in the PBH system and to document the particular issues in each and how they can be addressed (see map). These issues will be further explored in the sections that follow.

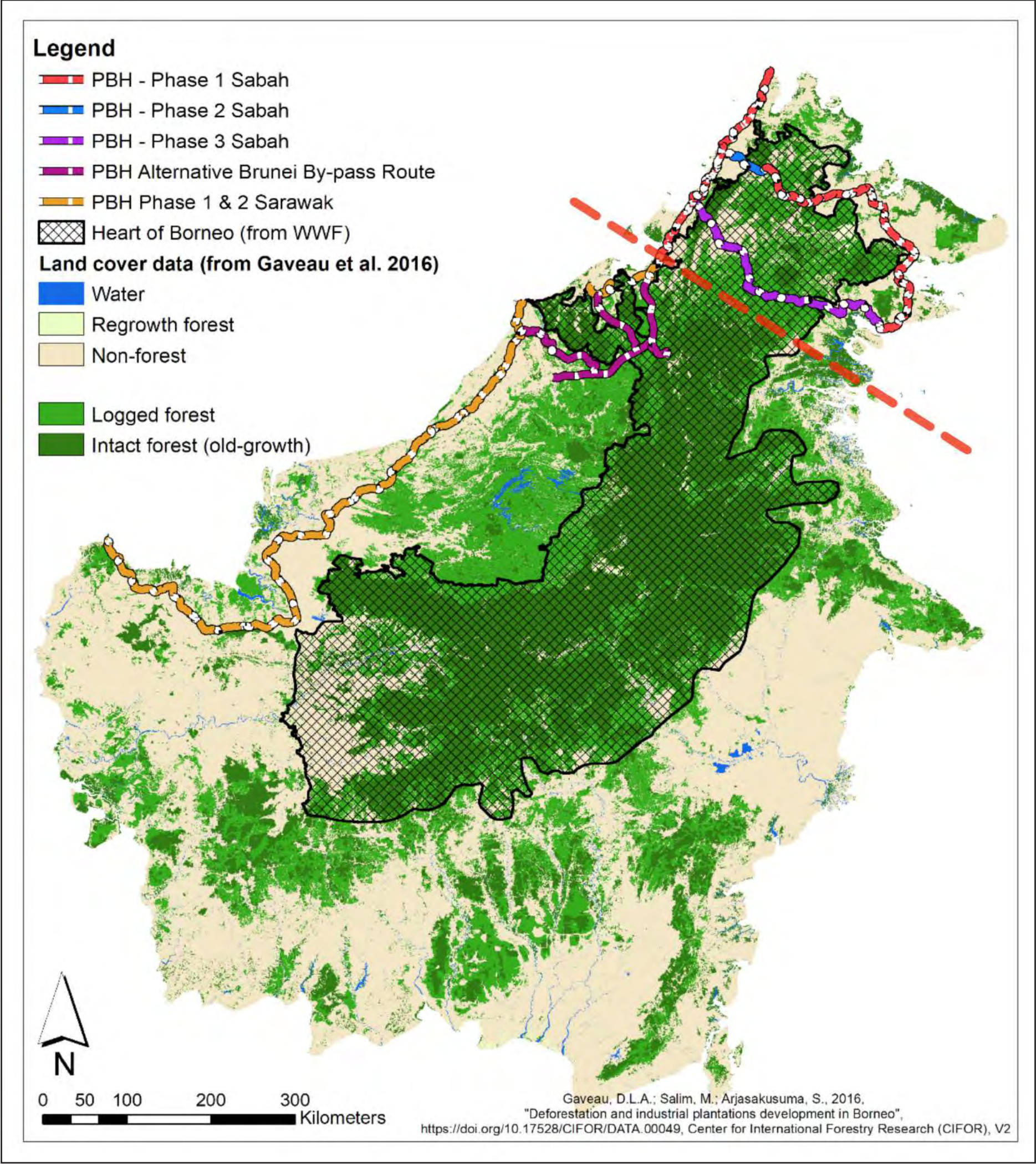
Experience around the world and in Malaysia shows that roads in biodiversity hotspots have multiple long-term negative impacts on wildlife (see insert). This is why there is so much international emphasis on keeping roads out of protected areas, and why this is included in Sabah law under the Sabah Structural Plan 2033 and various state Species Action Plans.

KNOWN NEGATIVE IMPACTS OF ROADS IN ENVIRONMENTALLY SENSITIVE AREAS (ESAs):

- Direct roadkill, especially at night, with larger species also proving a threat to the lives of motorists.
 - Access to poachers and rare plant collectors.
 - The spread of invasive species along roadside verges.
 - Illegal or legal occupation is facilitated in the area, often beginning with roadside stalls.
 - Blocking of migration routes and normal wildlife movement, creating fragmented “islands” too small to maintain populations of rare or large species in the long term.
 - Increased fire risk - just one cigarette thrown out of the window onto a dry grass verge.
 - Increased water run-off leading to erosion, siltation and landslides.
 - On-going pollution by vehicle exhausts and risk of chemical spills through road accidents.
 - Noise pollution that disrupts birds, insects and other species that use song and calls to communicate.
 - Light pollution at night confuses navigation by insect and other species, leading to lack of mating, lack of feeding and death.
-



Socio-ecologically sensitive & critical wildlife stretches of the Pan Borneo Highway



Map showing how the head of the Heart of Borneo would be ‘cut off’ by building a 4-lane PBH in Sabah

FINDINGS ON THE PAN BORNEO HIGHWAY'S ENVIRONMENTAL IMPACT

The current PBH routing unnecessarily passes through mangroves, forest reserves and other protected areas and contradicts Sabah's Species Action Plans, notably for the Bornean elephant and proboscis monkey; these routings cut across Sabah and Malaysia's biodiversity commitments as well as international treaty obligations under the Convention on Biological Diversity.

The proposed Phase 3 (Kalabakan) PBH Stretch would permanently "cut the head off the Heart of Borneo" by dividing Sabah's most biodiverse region from the rest of the Heart of Borneo with massive cumulative long-term consequences.

Sabah's natural assets are its greatest comparative advantage economically as well as culturally; the lack of attention to environmental issues in PBH planning is creating long-term financial costs, such as damage to fisheries, risk of major fires and loss

of tourism opportunities; these losses first hit local communities hard, but will impact Sabah's whole economy in the long-term. Sabah's economy, like that of the rest of Malaysia, is already badly hit by COVID-19 related restrictions.

Water management is one of the least discussed consequences of poor infrastructural planning in Sabah. The PBH and associated hill cutting have increased flooding, siltation, water pollution, disruption of tidal flows in mangroves and even marine water quality (damaging coral reefs and sea grass); all of these with major hidden and unnecessary financial costs to Sabahans.

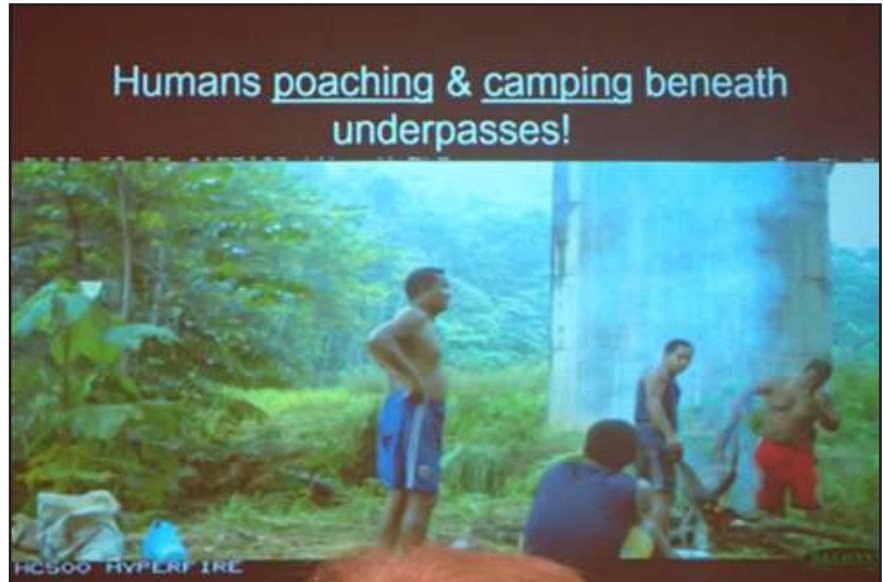
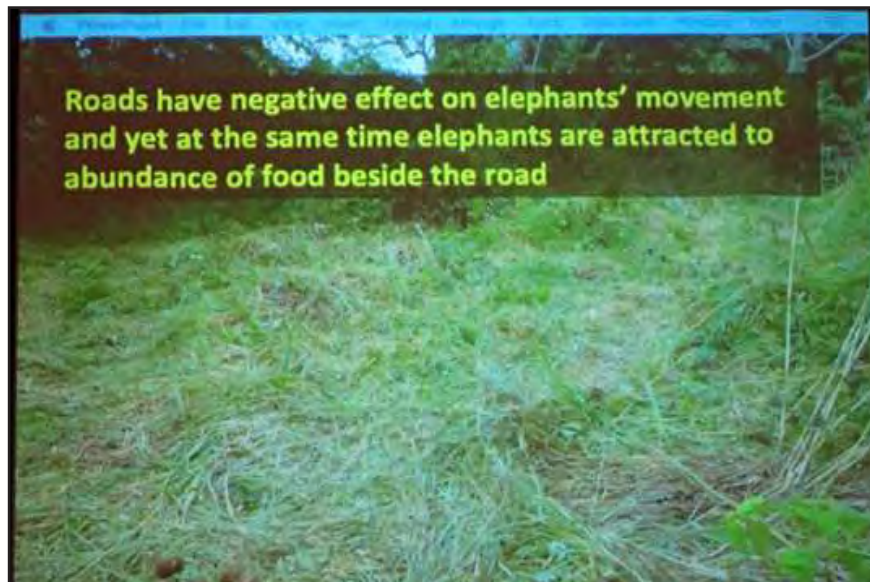


(ii) WILDLIFE CROSSINGS & ROADKILL MITIGATION

Reducing wildlife roadkill has become a global issue. It particularly impacts mammal and reptile species and has been shown to have considerable impact on wildlife populations. As roads get wider and faster they become more dangerous to wild animals. Numerous reports from Peninsular Malaysia of road kills involving mammals such as tapir and elephants indicate that new highways form a significant challenge to wildlife and also kill people.

FINDINGS

- Overpasses or tunnels are expensive. It is usually cheaper to re-route roads to avoid wildlife hotspots, but where this is impossible costly mitigation is recommended. However, some species, particularly shade-loving birds and some invertebrates, may never cross an open sunlit area so the particular type of mitigation strategy need to carefully be considered.
- Data on wildlife crossing points such as viaducts and tunnels in Malaysia and field evidence shows that wildlife tend to prefer viaducts or overpasses, as tunnels tend to be more frequented by poachers and human disturbance from campers etc. Having natural vegetation on the crossings is also very important. As stated in the Sabah Structure Plan 2033, tunnels for the highway itself is an effective strategy in order to avoid sensitive environments and leave natural habitat in situ.
- So far, the Malaysian government has only constructed a small number of wildlife crossing structures and the only ones in Sabah are a tunnel and an overhead bridge both built across the access road to Maliau Basin in the Maliau Basin Buffer Zone, and constructed by Sabah PWD with input from the Maliau Basin management. Evidence so far shows that more animals use the overhead structure than the tunnel.



Presentations from a conference entitled "Road Ecology: Transportation Infrastructure and Wildlife Conservation" held in Kuala Lumpur in 2019 organised by the Association of Consulting Engineers Malaysia (ACEM) revealed that poachers may target underpasses as places to hunt wildlife and also that roads may attract elephants due to the grasses that grow along the road sides, thus increasing the likelihood of roadkill. Further studies are needed to design wildlife crossings around local wildlife behaviour and poaching pressure in Sabah



Small-scale wildlife bridges have already been found valuable in Sabah, with a wildlife overhead crossing approximately 25m long and 3.5m wide on the access road to Maliau Basin. This location was chosen as the road embankments constructed are steep making crossing difficult for wildlife. Camera traps have revealed the overhead crossing is used by banteng, deer, wild boar, macaques and even elephants both during the day and at night time.

SABAH ROADKILL FIELD STUDIES

HHH partnered with UCSF to support student research to undertake some of the first roadkill studies in Sabah. The study sought to understand wildlife-road interactions in five major traffic corridors (Sindumin-Papar-Tuaran, Kota Belud-Kota Marudu-Kudat, Tamparuli-Telupid-Sandakan, Kinabatangan-Lahad Datu-Tawau and Tawau-Kalabakan-Keningau-Kimanis), all areas where PBH construction is planned or ongoing.

In these areas where the PBH will be built endangered animals such as Bornean elephants, pangolins, clouded leopards, proboscis monkeys, slow loris and banteng were sighted along the road sampling transects. These species are susceptible to Wildlife Vehicular Collisions (WVC), and alarmingly, human lives may be at stake if large animals such as elephants and banteng are involved. Sadly, a checklist with as many as 21 mammal, 10 bird and 5 reptile species were found as roadkill on the existing roads that the expanded and faster PBH would replace.

Endangered animals were mostly sighted in the Kinabatangan and Kalabakan regions and roadkill frequency was highest in Kinabatangan. Data from social media and the scientific literature supported our field observations as similar species were reported.

Bearded pigs, leopard cats and civets were frequently sighted along rural roads fringed by village houses, though roadkill in these areas mostly involved long-tailed macaques, monitor lizards and domesticated cats and dogs. This indicates some species such as bearded pigs and leopard cats can adapt to disturbed areas. Wildlife warning and speed limit signage should also be installed on roads across the rural landscapes. Interestingly respondents in rural areas typically believed that the cat road kills were domesticated species—until they looked closer and discovered these were often actually native wildcat species (of which there are five in Sabah). There is clearly a need and opportunity to educate drivers because the visibility of small nocturnal mammals is low at night.

The study discovered food waste discarded along the roads attracts wildlife. In Sook, for example, long-tailed macaques gathered along the roadsides and searched for food waste. The behaviour may be emulated by other species and poses a roadkill risk.

The study calls for exploring the application of wildlife overpasses, underpasses and canopy bridges, as is happening in other states of Malaysia and around the world.

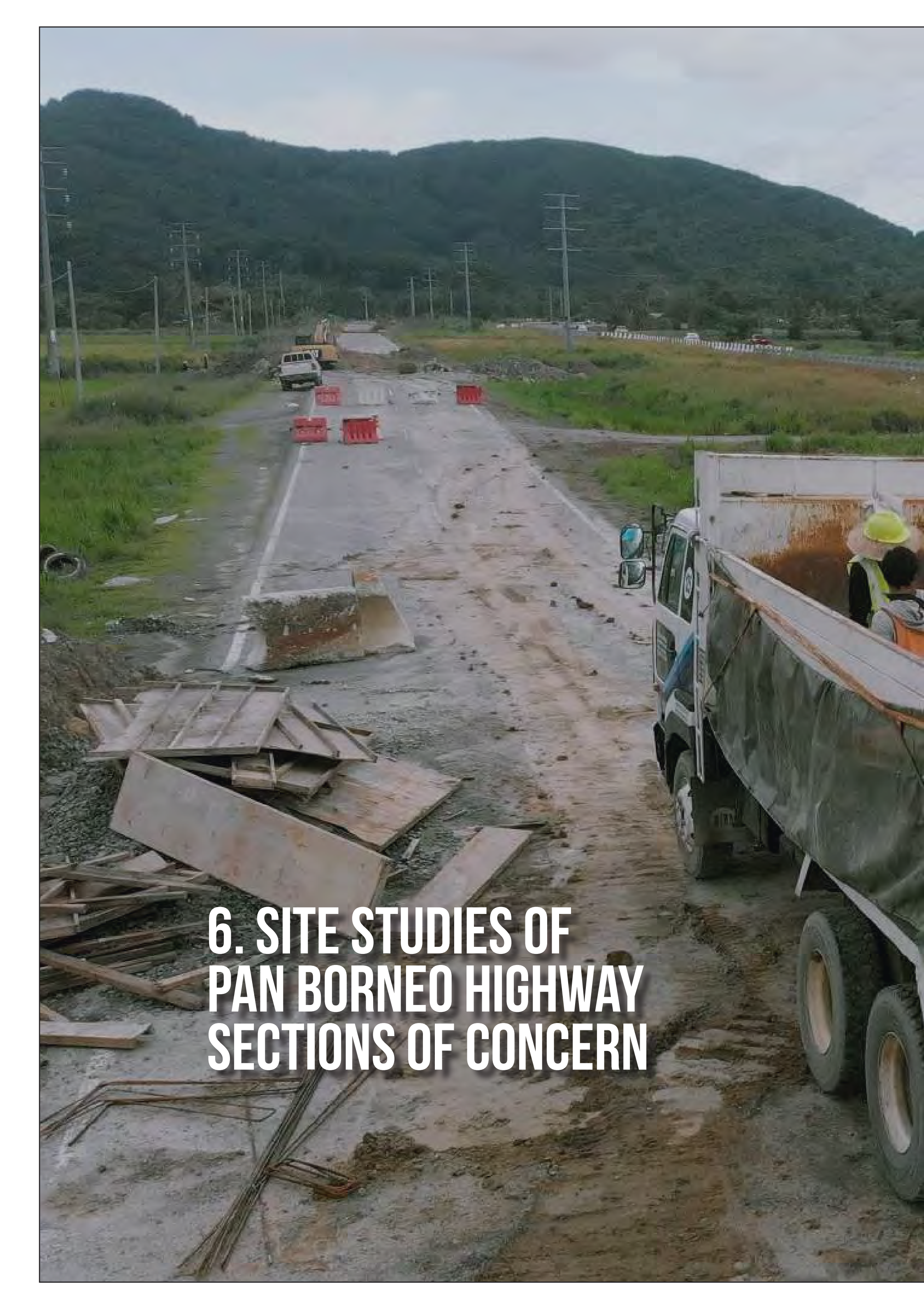


Leopard cat (*Prionailurus bengalensis*) killed by passing vehicle
(Photo: Wong Siew Te)

RECOMMENDATIONS

- Building roads through or near forest reserves and other wildlife hotspots should be avoided, as stated in the Sabah Structure Plan 2033 and the five Species Action Plans.
- Some of the largest and biodiverse natural habitats in Sabah (the Kinabatangan and Kalabakan) which form part of the Heart of Borneo are scheduled for PBH Highway Routes, so planning how to avoid wildlife roadkill will be critical.
- More research is needed on the effectiveness of wildlife crossing mitigating structures and their long-term impact on wildlife and ideally to plan routes for roads which do not cut through wildlife habitat in the first place.

In fact, for the Kinabatangan especially, if a tunnel system is used between Pin Supu Forest Reserve for the highway itself, the PBH could actually greatly benefit the wildlife of the Kinabatangan by then restricting the existing 2-lane to only local traffic.



6. SITE STUDIES OF PAN BORNEO HIGHWAY SECTIONS OF CONCERN



(i) WEST COAST REGION: PAPAR (PHASE 1: WP05)

Here a 4-lane highway is being/has been built, following or near the existing 2-lane road.

FINDINGS

- 225 ha of wet paddy fields in the Papar district have been affected.
- Many people’s homes have been affected by the construction of the PBH, with houses being demolished, orchards destroyed and families forced to move.
- Villagers have complained of disruption of rice field hydrology including blocked drainage and exacerbated flooding.
- Rice production, important for income, food security and cultural identity, has been affected.
- Interviews with local residents revealed there have been issues over compensation such as insufficient or late payments and lack of response and inadequate information from authorities.
- Pollution is also a key threat, especially heavy metals that are often associated with highway constructions and pose great risk to people’s health.
- Sedimentation is another key threat from road construction for paddy, as well as the impacts from highways on waterways.



RECOMMENDATIONS

- Since the heaviest traffic on this road is daily commuting for work in Kota Kinabalu the development of public transport alternatives would be highly cost effective.
- Ensure Free Prior and Informed Consent (FPIC) is carried out for any future projects.
- Make sure that any new roads benefit local people, not just commuters from cities.
- Future road construction in this area should avoid any further damage to rice paddy land and drainage and irrigation systems



Impacts of the PBH in this region include ramparts and lack of culverts causing blockage of water flow, residents' dwellings and lives being severely impacted, and food security as some of the rice fields cannot be worked on because of it.

A study by UCSF students called “Evaluation of Water and Soil Quality at Paddy Fields Along the Pan Borneo Highway Construction Area” was driven by real-world issues and food security concerns. They investigated the paddy fields where PBH construction is ongoing in Papar and Kota Belud. These renowned agricultural landscapes are now dissected by miles of linear heaped hill cuttings upon which the new road will be built. Such massive earthwork can be expected to introduce unwanted siltation in the canals and fields, while pollutants from roadwork chemicals and machinery could leach into the paddy lands. The risks may be spread through irrigation canals.

To assess roadwork impacts on soil and water quality, samples were extracted from the paddy fields to measure the usual variables for assessing safety and pollutants including pH, electrical conductivity, moisture content, organic matter, total nitrogen, bulk density and heavy metal contents such as cadmium, chromium, copper, lead, zinc, iron, magnesium and manganese. Meanwhile, baselines were measured in the paddy fields of Tambunan which are unaffected by roadwork, to compare the levels of pollutants with and without road building.

Pollutants and toxic elements that build up in waters and soils may affect the healthy growth of paddy. Moreover, the metals may accumulate in the rice grains, and thus potentially be harmful to people when consumed.



FINDINGS

- High chromium levels were found in soil samples from Kota Belud when compared to soil samples of Papar and Tambunan. This may be caused by machinery traffic and steel used in the roadwork processes.
- High levels of manganese and iron were also found in water samples from Kota Belud when compared to water samples of Papar and Tambunan. Studies have shown manganese can originate from vehicular engine combustion of methylcyclopentadienyl manganese tricarbonyl (MMT) and manganese toxicity can affect plant metabolic processes.
- Further increase of heavy metals in the soil and water can be expected in the future when the highway is open to traffic. This is supported by studies in Malaysia, China and around the world that show heavy metal contamination from roadside soils to the adjacent agriculture sites can become more significant once the road is in heavy use by traffic.
- As expected, road building did not impact dissolved oxygen, biochemical oxygen demand and chemical oxygen demand levels. These were found to be acceptable and within the Class 4 threshold for agriculture irrigation of the Malaysian Water Quality Standard.
- Empirical data collected by the UCSF studies are expected to be valuable for informing the planners and roadwork contractors to deploy the necessary safeguards for protecting the critical rice bowls of Kota Belud and Papar, and ensuring Sabah is able to reduce its dependency on importing rice. It also alerts us to risks to areas in Sabah where roads may be planned across paddy lands.

(iii) **NORTHWEST REGION: SERUSUP, TUARAN -
TG SIMPANG MENAYAU, KUDAT (WP09-14)**

A total of 124 km of new 2-lane road with 14 bridges along the northwest coast of Sabah, were planned to provide access to beaches and to increase tourism potential to an area framed as 'Kinabalu Gold Coast'.

The EIA by ENSOLVE SDN BHD was submitted to EPD in September 2017. The initial EIA was not approved and further information was requested by EPD. Conditional approval was given for WP10 only, once stipulated conditions had been met. It is unclear at present when the construction of the remaining stretch of the Tuaran - Kudat PBH will take place.

- Distance of the road to the coast is as close as 20m in some places (EIA Section 1.1.2.3)
- Loss of vegetation and increase in sediment from the road and bridge construction will significantly impair water quality, hydrology, tidal volumetric turnover and aquatic life food-chains in the mangroves, rivers and estuaries, and cause a substantial drop in seafood productivity thus affecting the local artisanal fishery communities.
- Lema'as Domestic Forest Reserve, Sulaman Lake, Abai and Kudat and Marudu Bay Class V Mangrove Forest Reserves will be impacted. Mangroves have many critical functions as breeding grounds for fish, crabs and other marine life, as buffers against rising sea

levels, storm events, coastal erosion and tsunamis, as carbon sinks helping to mitigate climate change and as habitat for fireflies and other wildlife including proboscis monkeys.

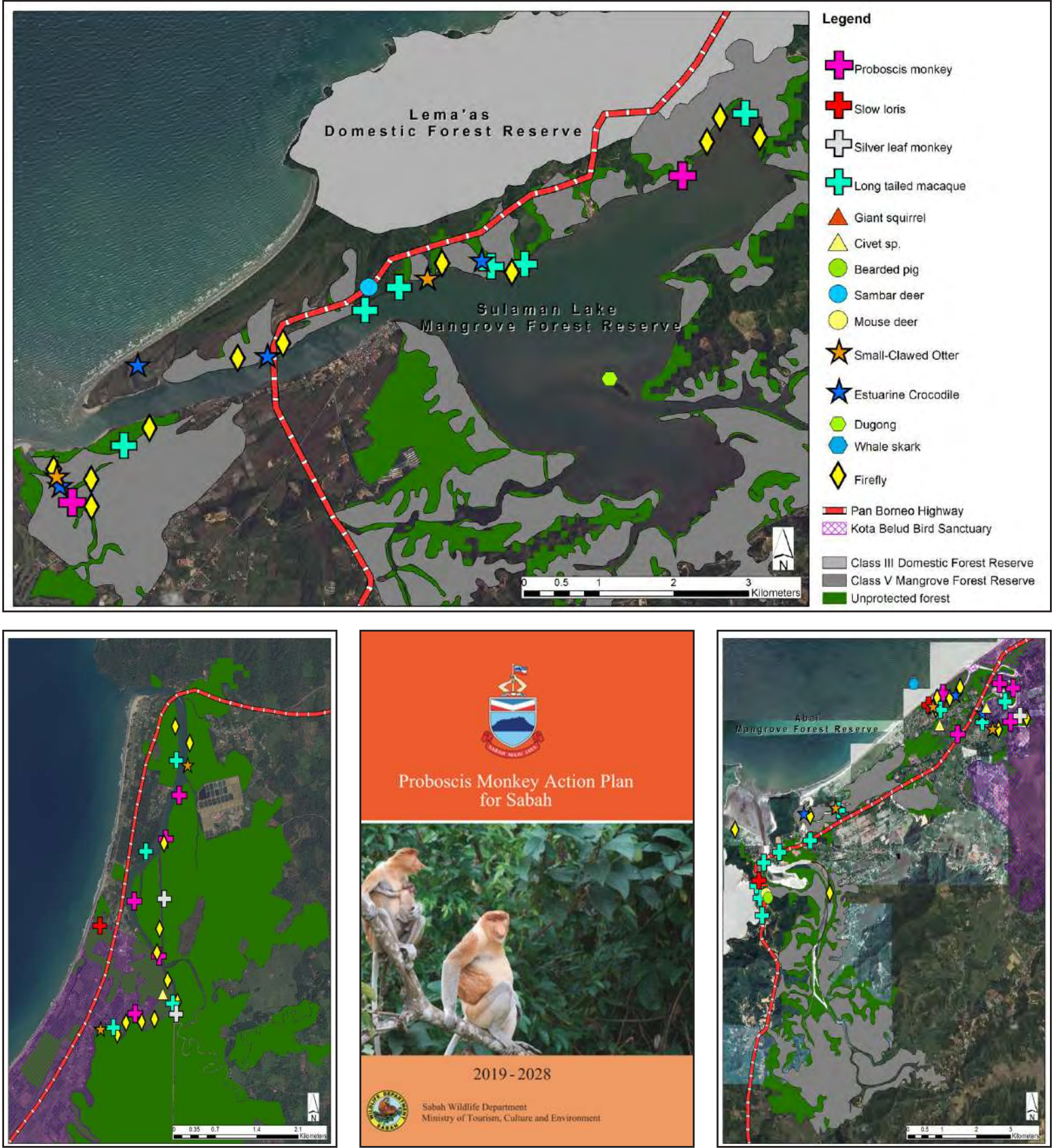
- Proboscis monkeys, endangered, endemic and Totally Protected Species under the Sabah Wildlife

Loss and Degradation of Habitat used by Proboscis Monkeys' as its principal objective.

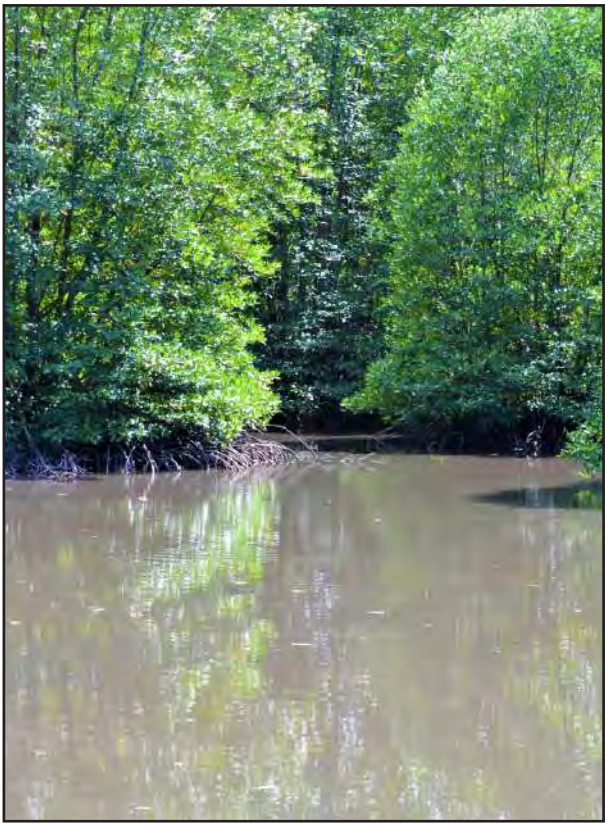
- The PBH cuts through the Kota Belud Bird Sanctuary, a regionally important site for migratory and resident birds.
- The Sabah Shoreline Management Plan (DHI, 2005) requirement for the road development appears to have been requested to be waived for the project. Some of the proposed alignment would require rezoning.
- EIA was for a 2-lane road but the road width may be widened to 4-lanes later.
- There are few PBH signages at some areas under construction e.g. WP10 having almost no signage at all.

**GENERAL
CONCERNS**

Conservation Enactment 1997, have been recorded in the Sg Wario and Rampayan coastal areas where the PBH is being constructed. This contradicts the recently launched Sabah Proboscis Monkey Action Plan (2019-2028) which stresses 'Halting



Proposed PBH coastal routes would affect sensitive and important natural habitats such as mangroves, sea grass beds, estuaries and coastal fishery areas.



WP 10: PITURU-RAMPAYAN LAUT (32.2KM) - currently under construction:

Site visits to WP 10 in March 2019 and February 2021 discovered:

- Construction reported by residents to have started in November 2018 - before approval was given, and areas with proboscis monkeys close to the cleared sites; EPD site inspection took place on 22 April 2019 and legal action taken against contractor (fine and temporary stop work order).
- Construction of the road very near the shoreline, mangroves destroyed by road construction, spur road through Abai Mangrove Forest Reserve, and proboscis monkey populations near Sg Wario and Kota Belud Bird Sanctuary.
- Run off of sediment into the sea, massive hill cutting for a 2-lane road and evidence of dynamite blasting.
- At least 9 groups of proboscis monkeys in the area (Totally Protected Species), as well as many other such as dugong, fireflies, small-clawed otters, fruit bats and silvered leaf monkeys.
- The EIA failed to report the presence of these proboscis monkey populations, (as well as sea grass beds and the potential presence of dugong in Sulaman Lake).
- The EIA failed to give proper assessment of fragmentation of habitat and its effects on wildlife, and predictions on hydrology and natural tide movements that will affect mangroves.



Extensive hill cutting for the new 2-lane PBH near Kampung Kastam

RECOMMENDATIONS

To conserve the fragile coastal environment and the very resources which the proposed ecotourism developments along this stretch of Sabah's coast are supposed to promote, we strongly recommend:

- Areas in WP10 with mangrove and near proboscis monkey habitat to be restored and alignment moved away from these areas and the coastal stretch.
- Re-alignment of the remainder of this stretch of the proposed PBH to avoid sensitive mangrove, proboscis monkey and bird habitat, specifically in: Sulaman Lake, Abai and Kudat and Marudu Bay Mangrove Forest Reserves, in Kota Belud Bird Sanctuary and in Kg Longgom Kecil where there is extensive intact mangrove.
- Review of the bridge and road drainage culvert designs to ensure they do not impair the natural tidal hydrology, water quality and aquatic habitat vitality.
- To review and correct the current construction practices which may have already degraded the terrestrial and aquatic habitats.
- The 2017 EIA for this project should be reviewed to incorporate the State Proboscis Monkey Action Plan 2018-2028 in order to conserve this endangered & endemic species
- Currently unprotected areas of mangrove should be protected as Class V Forest Reserves (priority Kota Belud Bird Sanctuary Kg Rampayan & Sg Wario areas as proboscis monkey habitats)



(iv) CENTRAL REGION: MILE 32, SANDAKAN -
RANAU WP28 - WP35

172 km of 4-lane road and 19 bridges through the districts of Ranau, Beluran and Sandakan, often through rugged terrain.

EIA BY CHEMSAIN KONSULTANT SDN BHD submitted to EPD April 2018. Not yet approved.



The above figures show a baby elephant on the Telupid road, a report developed by the 3H Coalition and a map showing alternative PBH alignments that will, largely, avoid elephant range in the Telupid region.

WP 31: Sg. Bauto-Telupid. The proposed alignment of the PBH cuts through the 22,697 hectare TAWAI CLASS 1 PROTECTION FOREST RESERVE, part of the Heart of Borneo (HoB) and ULU SAPA PAYAU CLASS VI VIRGIN JUNGLE FOREST RESERVE and cuts through 30km of elephant range. It would potentially cause:

- Loss of connectivity between southern and northern parts of the Reserve and formation of an ecological barrier and restriction of wildlife movement (e.g. for orangutan).
- Increased human-wildlife conflict especially with endangered Bornean elephants (*Elephas maximus*

borneensis) that occur in the area.

- Potential injury to workers or even loss of human life caused by elephants during construction of PBH.
- Likelihood of future traffic

and encroachment into the Forest Reserve.

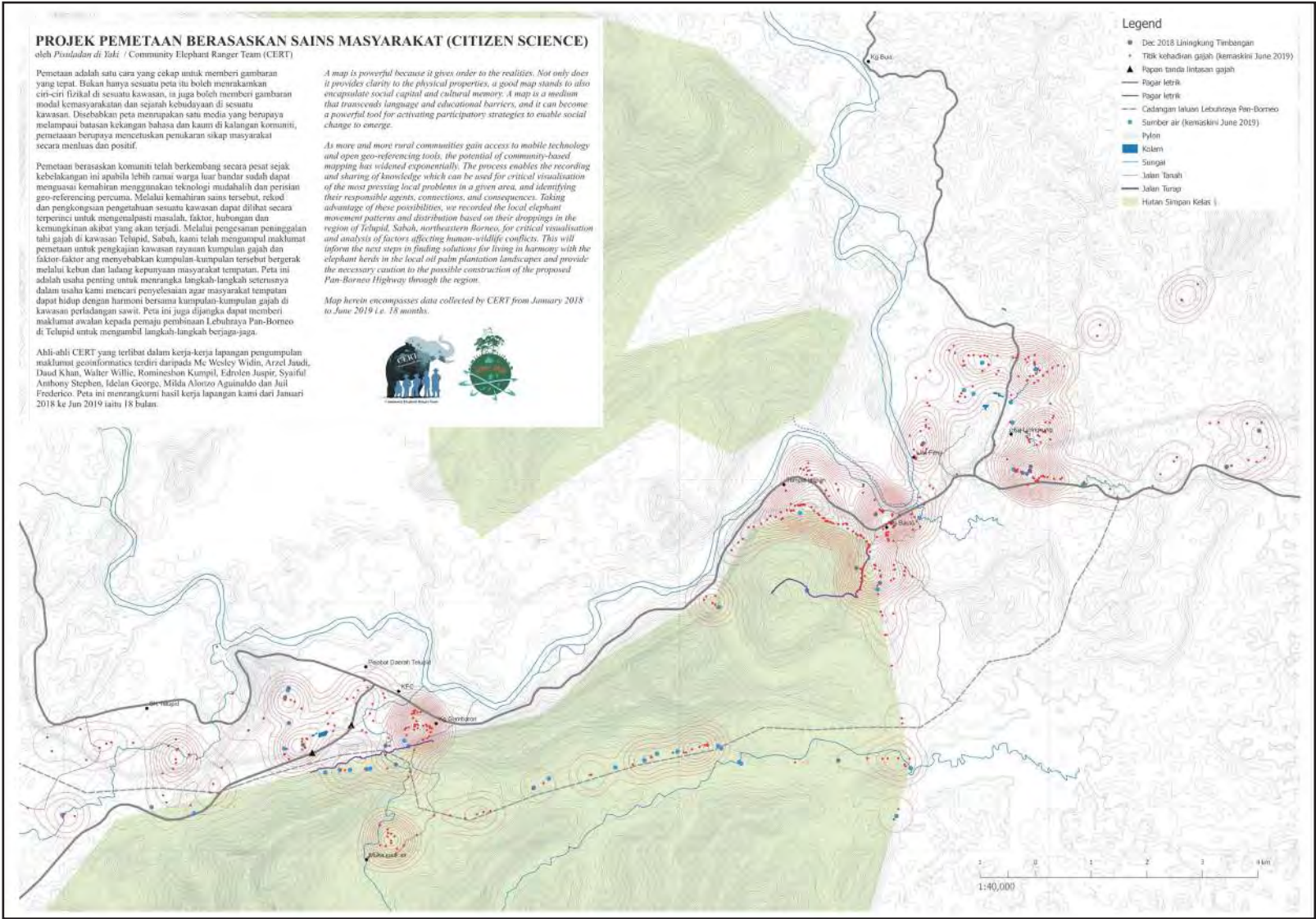
- Increased risk of fire due to ultramafic geology.
- Tawai Forest Reserve is the water catchment for Telupid and major disturbance of the forest may impact Telupid's potable water supply

CONCERNS

collisions of cars, trucks and tourist buses with elephants, leading to potential injury and even loss of human life.

- Increased wildlife road kills in general.
- Increased risk of poaching

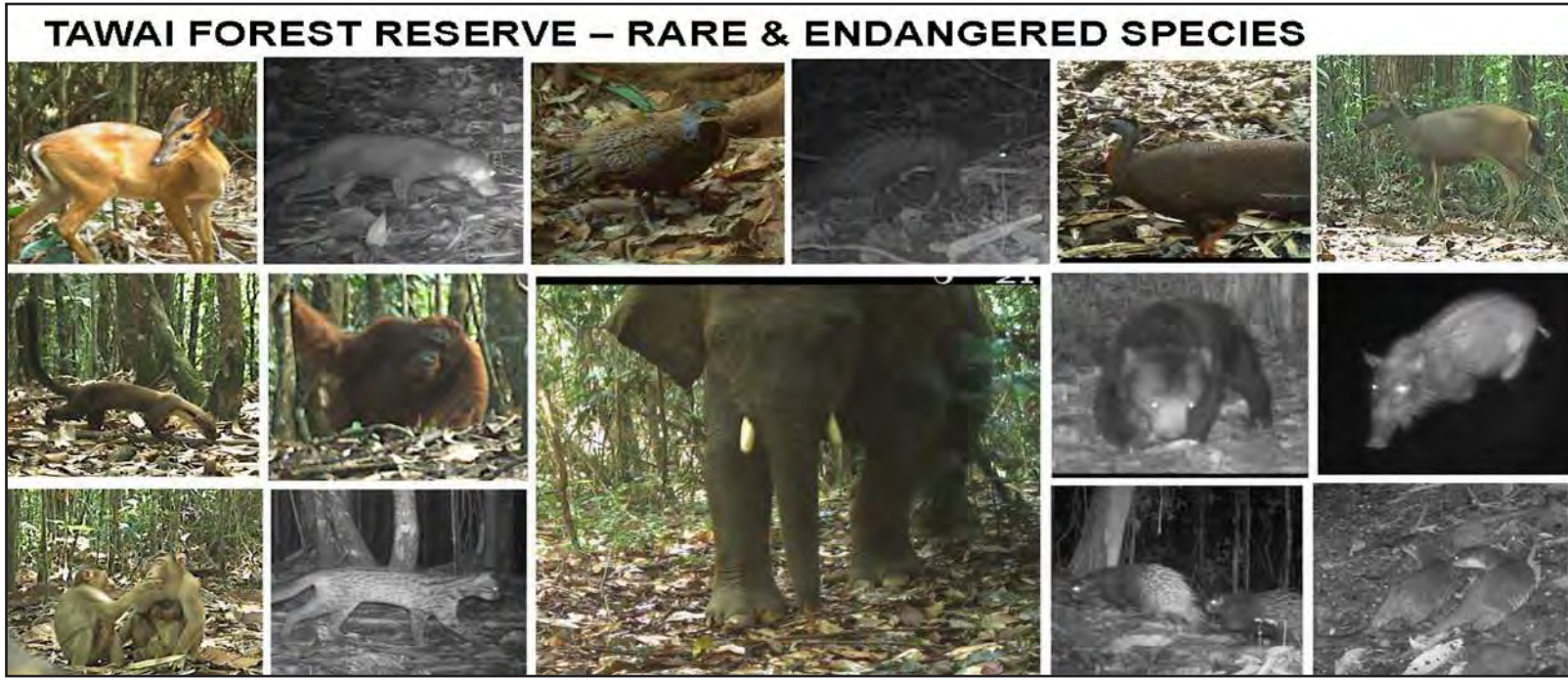
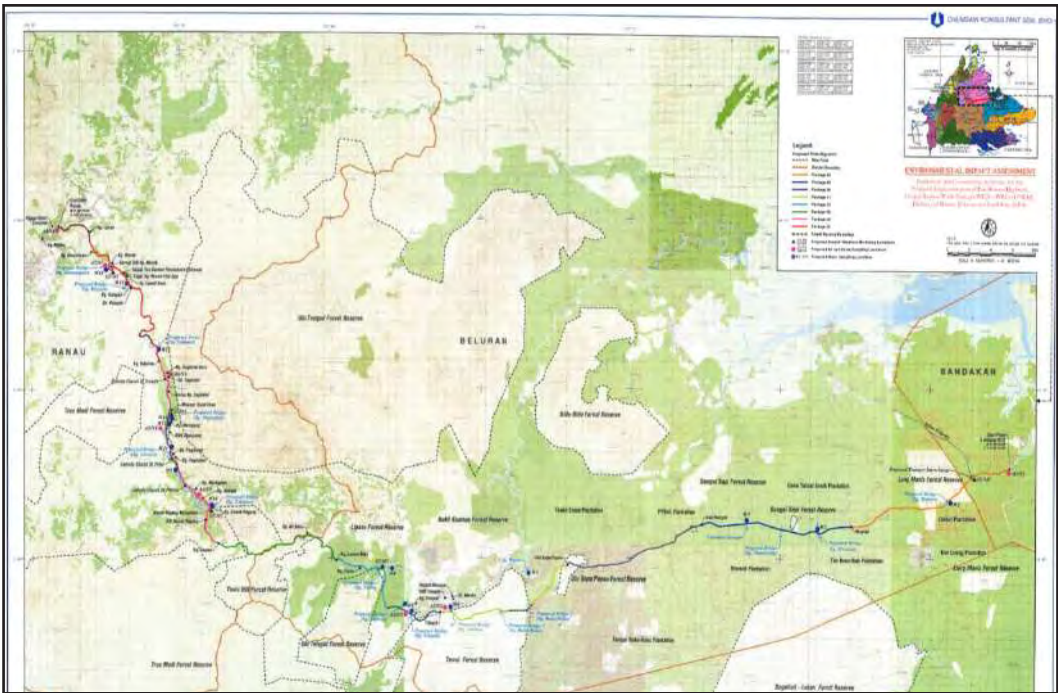
The Bornean elephant in Sabah is totally protected under Schedule 1 of the Wildlife Conservation Enactment 1997 and listed as "Endangered" by the International Union for Conservation of Nature (IUCN Red List). The remaining Bornean elephant population in Sabah is estimated to be not more than 1,000-1,500 individuals. The Bornean Elephant Action Plan for 2020-2029 was formulated by the Sabah Wildlife Department and approved by the state government in February 2020 and stresses connectivity of habitat is essential to conserve elephant populations.



BOTTOM LEFT: Telupid town with Tawai Class I Forest Reserve in the distance

RECOMMENDATIONS

- To create a wildlife or eco-friendly alignment by considering the several alternative routes proposed by Coalition 3H which would avoid cutting through Tawai Class I Forest Reserve and elephant migration routes, as well as minimize compulsory acquisition of local villagers' land. (SEE 'OPTIONAL ROUTING OPTIONS FOR THE TELUPID SECTION OF THE PAN BORNEO HIGHWAY' FOR MORE DETAILS)
- Rumble strip installation on road stretches across sensitive areas to alert drivers (and wildlife).
- Consider a lower speed limit (e.g. in Sarawak, roads across wildlife sensitive areas are designed to 50km/hr).
- Street lighting to increase visibility.



TOP LEFT: Elephant dung on the route that is currently proposed for the PBH through Tawai Forest Reserve.
BOTTOM: Picture courtesy of Seratu Aatai/CERT

THE TELUPID COMMUNITY ELEPHANT RANGER TEAM (CERT)

Kopisuladan di Aki, a Community Elephant Ranger Team was formed during 2016-2017 with villagers impacted by elephant presence in Telupid in central Sabah. With support from FS, the Sabah Wildlife Department, Seratu Aatai and other partners, CERT has successfully transformed a Human Wildlife Conflict situation into one aspiring to Human Elephant Harmony (HEH) and gathered and analysed data on elephant movements and behaviour in this region. Application of this data in the recommending of new alignments for the proposed route of the PBH through Telupid has been a key part of Coalition 3H's work on this stretch of the PBH.

FINDINGS

- The latest geoinformatic data collected by CERT show there are possibly two to three elephant herds foraging in the Telupid area and we now have a better understanding of their movement patterns in higher resolution both during day and night. It is believed that the herds can somehow communicate with each other and may sometimes congregate to form a single large herd.
 - Findings show that elephants cross the existing main road in this area possibly to go to the Labuk River. Elephant crossing signs to warn road users were put up at known crossing points in the Telupid area in October 2018, in collaboration with Seratu Aatai, a Coalition 3H member.
 - Data collected was used to inform the locations for the placement of electric fences by Sabah Wildlife Department in October 2018 to try and mitigate human- elephant conflict in both large oil palm estates and villagers' small holdings.
 - A map of elephant presence based on data collected from January 2018 to June 2019 (i.e. 18 months), with Bahasa Malaysia descriptions, was produced in July 2019 for dissemination to local stakeholders.
- The A2 map is intentionally designed for printout so that it can be brought along for community meetings and discussions. This work allows visualisation and analysis of factors that may increase human-wildlife conflicts and provides the necessary caution to the possible construction of the proposed PBH through the region. This map was shown by CERT at stakeholder gatherings in Telupid in January and March 2019 where potential PBH alignments were discussed with local communities.
- CERT continue to patrol Tawai Forest Reserve and work closely with small holders and nearby plantations and since 2019 human elephant conflict (HEC) has diminished significantly in the area.
 - CERT has also deployed camera traps to record wildlife on the proposed PBH route and found evidence of rare and endangered species such as otter civet, orangutan (Totally protected under the Sabah Wildlife Conservation Enactment) 1997) and Bornean peacock pheasant (only the second sighting of this rare Bornean endemic in the last 20 years).



RECOMMENDATIONS

- Ensure the sustainability of such work by strengthening foundations to encompass for example appropriate ecotourism and environmental education in the area.
- Continue to promote and support this type of citizen science, empowering local communities and valuing local knowledge.

WP33: KG. LUMOU BARU-K. TOUPOS THROUGH BUKIT TAVIU CLASS 1 FOREST RESERVE,

also part of HoB, comprising hilly and steep terrain

The proposed alignment would create:

- Extensive hill cutting (up to 75ha of virgin forests) including on very steep slopes.
- An ecological barrier to orangutans (Critically Endangered), gibbons and other species known to occur

CONCERNS

in Taviu Forest Reserve, leading to fragmentation of populations.

- An increase in wildlife road kills.
- The famous Australian POW Death March route will be negatively impacted by construction and any widening of the road.

RECOMMENDATIONS

- Serious consideration of maintaining this stretch as 2-lane with the current alignment and with passing points in this highly sensitive and hilly area.
- If not, then a combination of tunnels/ flyovers for vehicles to minimise hill cutting, and overpasses or underpasses for wildlife of at least 50m wide and covered with natural vegetation.
- Speed reduction measures including rumble strip installation on road stretches across sensitive areas to alert drivers (and wildlife).
- Consider a lower speed limit (e.g. in Sarawak Pan Borneo Highway, roads across wildlife sensitive areas are designed to 50km/hr).
- Street lighting to increase visibility



LEFT: Existing road through Taviu FR showing the HoB sign and hilly terrain.
RIGHT: Death March sign in Taviu Forest Reserve

(iii) NORTHEAST REGION: Lahad Datu Bypass - Mile 32, Sandakan. WP22-27

126.5km. No known TOR or EIA submitted to EPD as yet for this stretch. Widening of a 2 lane road to a 4 lane road to facilitate movement of vehicles including palm oil lorries and tourist buses.

- The Kinabatangan is a globally renowned area for wildlife. WP 24 involves increasing the size of the existing Kinabatangan Bridge from 2 lanes to 4 lanes. Connectivity for wildlife would be further affected by a 4-lane bridge over the Kinabatangan River,



Clouded leopard (*Neofelis diardi*) and Proboscis monkey (*Nasalis larvatus*) are Schedule 1 Totally Protected Species. (Photos: DGFC)

CONCERNS

- as wildlife is already reluctant to cross over or under the 2 lane bridge.
- Increase in wildlife road kills.
- Social impacts - many local people would be displaced, as well as a world-recognised local ecotourism cooperative (KOPEL).

Potential mitigation option

Forested wildlife viaducts in strategic locations



FINDINGS

- A study on the existing dwellings in the WP22-26 stretch found that the number of dwellings affected in the 50m, 75m and 100m width of the 4 lane road scenarios were 247, 832 and 1,281 respectively. If however the PBH followed an alternative alignment, the numbers of dwellings affected were 236, 814 and 1,222 respectively under the different width scenarios, thus indicating that a small realignment of the proposed PBH could allow up to 59 houses to remain in situ.
- Road kill of many threatened species have been found on this stretch of road, including proboscis monkey and clouded leopard (both Totally Protected Species)



The existing 2-lane Kinabatangan bridge with buildings on both sides that would be affected by expansion to 4-lanes

RECOMMENDATIONS

- Keep the bridge as 2 lanes.
- Engagement with KOPEL to agree on minor realignment of the proposed bridge to avoid impacting KOPEL facilities.
- Re-route the alignment of the portion of the PBH south of the Kinabatangan bridge to an alternative route which is almost 8km shorter and located to the rear of community lands, largely following electric pylons and mostly in oil palm estates. This will significantly reduce the number of dwellings lost to the PBH and will allow communities to remain in their present locations.
- Construct mitigation measures including wildlife overpasses linking Pin Supu Forest Reserve which occurs on both sides of the proposed PBH just north of the Kinabatangan bridge to allow wildlife to cross.
- Install speed camera traps and warning sign boards.

(v) SOUTHERN REGION: Kalabakan - Sapulut

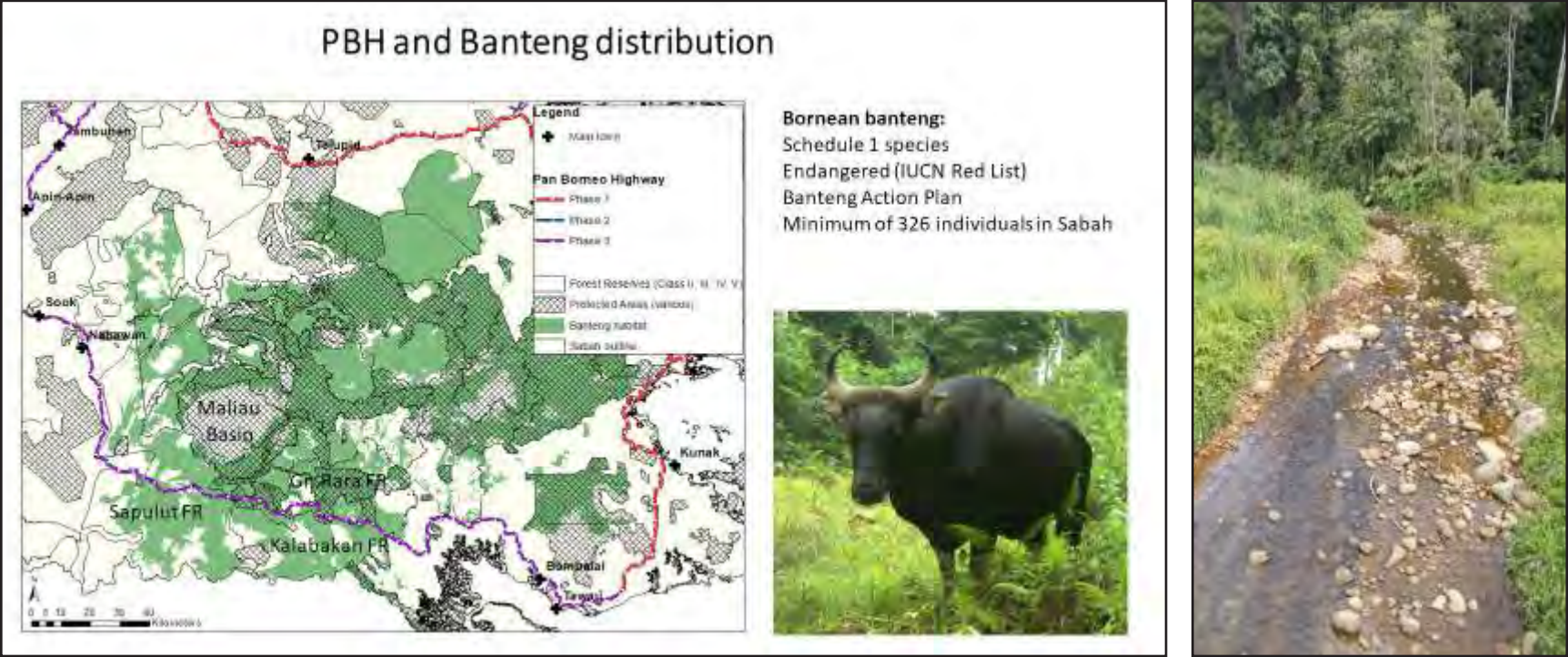
KALABAKAN - SAPULUT STRETCH - Phase 3, WP numbers not known. Approximately 170 km with several bridges. Existing 2 lane road to be widened to a 4 lane road. This stretch passes through numerous Forest Reserves and Maliau Basin Buffer Zone 2, areas which are rich in wildlife, and rugged terrain.

No EIA as yet.

FINDINGS

- This stretch passes through at least 170km of known Bornean elephant (*Elephas maximus borneensis*) habitat from south-west Ulu Kalumpang FR through Gunung Rara, Kalabakan, and Sapulut Forest Reserves and Maliau Basin Buffer Zone 2.
- The area is also important habitat for endangered and Totally Protected species under Sabah Wildlife Conservation Enactment 1997 such as banteng (*Bos javanicus*), Sunda clouded leopard (*Neofelis diardi*) and Sun bear (*Helarctos malayanus*).
- Wildlife is known to cross the existing 2 lane road in many places.





The proposed upgrading from the current 2-lane road to a 4-lane highway would cause:

- Loss of connectivity between key Protected Areas in Sabah, and fragmentation of the northern HoB, probably the greatest threat to regional integrity of intact forests in this area, including crucial loss of ecological connectivity to northern Kalimantan. In fact this proposed section of the PBH would “cut off the head

of the Heart of Borneo” and permanently isolate the wildlife populations of Sabah’s main remaining

lowland forests from the rest of Borneo island.

- Increased wildlife roads kills, including of large and endangered mammals.

- Potential injury and loss of life to motorists from wildlife collisions.

- Increased access for poachers and encroachment into the Forest Reserves.

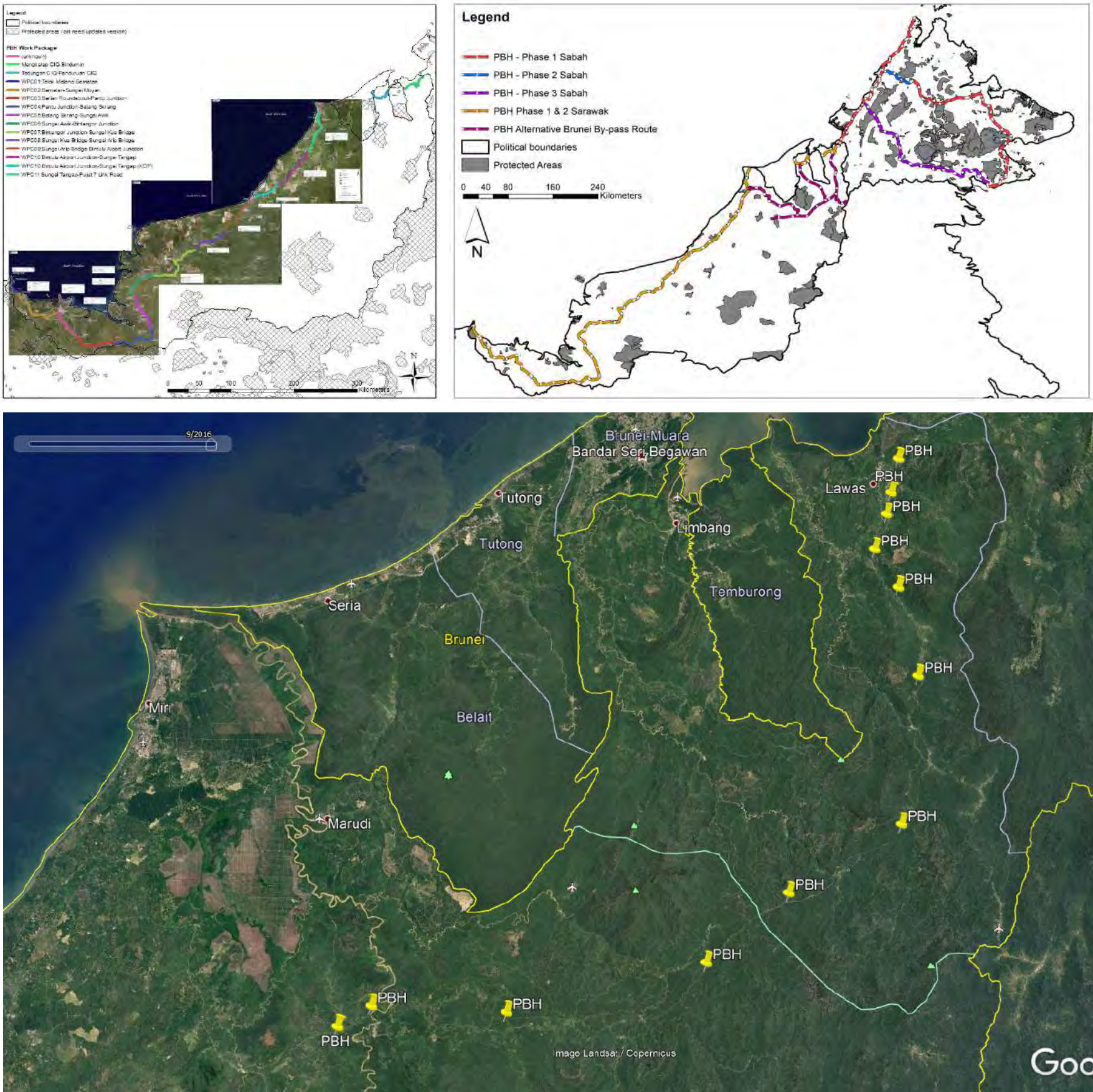
- Increased risk of forest fires.

CONCERNS

RECOMMENDATIONS

- Maintain the road as 2-lane with passing points and improved maintenance.
- If not then construct overpasses/underpasses at important crossing points for elephants and other wildlife.
- Speed reduction measures, such as speed camera traps and signage.
- Street lighting to increase visibility.

IMPROVING OUTCOMES OF MAJOR INFRASTRUCTURAL DEVELOPMENT IN SABAH:
FINDINGS FROM A CASE STUDY OF THE PAN BORNEO HIGHWAY



TOP: Digitized map of the PBH Sarawak and Sabah alignment. Close up of the Sarawak PBH Work packages 1-11
BELOW: Zoomed-in area that follows the pipeline through forested landscapes in northern Sarawak

(vi) SARAWAK

- The LEAP - FS team have been growing partnerships with NGOs in Sarawak including Save Rivers, Keruan, and potentially FORMA HOB (Forum Masyarakat Adat Heart of Borneo). We are focusing on two key regions - the Sabah-Sarawak connection and northern Sarawak, and in particular on the impacts of infrastructure development, especially large scale ones, on communities and protected areas. WWF Indonesia may also be engaged with in connection with the PBH stretch in Kalimantan.
- The objective is to forge an alliance for moving forward including the sharing of data and maps and the intention is to learn from and replicate the advocacy work that has been and is going on in Sabah, and at the same time strengthen and elevate the campaign by joining forces between Sabah and Sarawak civil society.
- Similar to the PBH alignment spatial work that was undertaken for Sabah, the PBH alignment has also been digitized for Sarawak. This process has been slow as we do not have satellite imagery for Sarawak and have been therefore dependent on obtaining and geo-referencing spatial information from Google Earth. The LEAP - FS team have provided these data to our Sarawak colleagues and used within our advocacy work.
- The HHH website will begin to include infrastructure issues and stories from Sarawak.

7. ADVOCACY & AWARENESS — ENGAGING THE PUBLIC

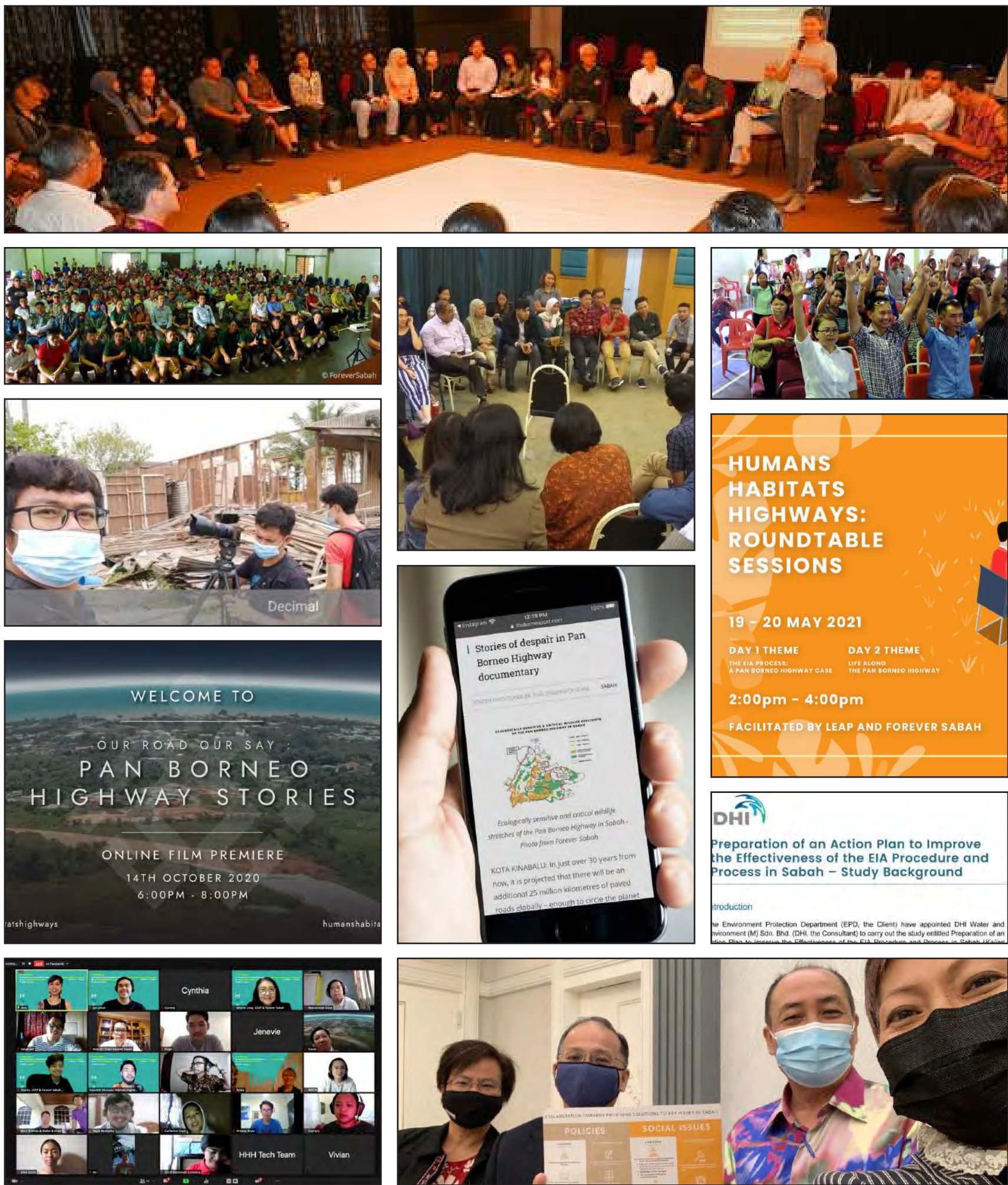
Convening stakeholders and the public and engaging with them has been a crucial part of the HHH work. It has been central in the generation of ideas and information and in the testing of research findings with stakeholders who have practical knowledge. It has also been key to appreciating the level of understanding that exists across Sabahan society about large scale infrastructure development and the PBH, and the willingness and ability of different stakeholders to share knowledge and work together towards solutions.

The HHH project opened by gathering in 2017 representatives of the major stakeholders in the infrastructural planning process in Sabah to better understand how decisions are made and the roles of the different stakeholders in the process. This consultation and engagement continued, both formally and informally, with an event with the Public Works Department and BHP, the PBH Project Delivery Partner in 2018, and the formal workshops and dialogues with all stakeholders co-convened with the Institute of Development Studies described in Section Three of this report.

These engagements with the institutional stakeholders were complemented by formal and informal engagements with communities who were concerned about the impacts of the PBH in their territories, such as in Kolopis in Penampang in 2018. In Telupid the routing issues of the PBH were addressed in a pair of major community forums in January and March 2019, which have been followed up by extensive discussion around routing alternatives, working with the local Community Elephant Ranger Team, Kopisuladan di Aki.

Over a dozen articles in the local newspapers covering different aspects these findings, and how they connect with the surprising history of road development in Borneo, have been published over the four years, and often reflected in international press coverage, including in [Mongabay](#). These articles have all been uploaded to the [Project website](#) and [Facebook](#) page, alongside other press coverage of the PBH and infrastructural issues. In April 2021 an article entitled '[Must the Pan Borneo Highway Dissect the Tawai Forest?](#)' was published online by a Kuala Lumpur based media outlet Macaranga. This formal media stream has been complemented by extensive social media on Facebook and [Instagram](#).

Meanwhile the results of field studies and these engagements have been presented alongside community representatives at the Heart of Borneo international conferences in Kota Kinabalu in 2017 and 2019.



Advocacy over the years, from 2017-2021

HHH has reached out to each of the three Sabah Chief Ministers who have served during this four-year project to offer a collaborative approach to improving sustainability in infrastructure development, and where appropriate to communicate the concerns of stakeholders on particular issues. We have also regularly alerted the relevant ministers and department heads to on-going problems on the ground, providing in 2019 the data and better alternatives in the case of the Telupid elephant crisis and the Tawai Forest Reserve PBH routing. These various communications have led to useful dialogues and often agreement, and in one case a stop order by EPD on unauthorized contractor work. However, despite often good intentions, the Sabah Government is yet to implement systematically decisions on improved planning and routing and the longer these are delayed, the more costly they may become.



Our outreach efforts made it clear that the Sabahan public were hungry for more information around the issue of improving infrastructural development, but that written articles were not the best way to share the stories from the ground. Furthermore, Sabahans are tired of being told what to think about the environmental and development challenges of the state. We therefore made the commitment to engage teams of community film makers to video community members to tell their own stories about the implementation of the PBH in their communities in six stretches (Papar, Kolopis, Tuaran, Kinabatangan, Telupid and Kalabakan). The stories were lively and diverse and covered the gap between the desire of local communities for better roads and the realities often faced of losses in agricultural land, threats to ecologically sensitive areas and forced displacement of their communities.

The incredible footage collected by our community partners was edited into a 1.5-minute trailer and a 25-minute documentary film with English/Bahasa Malaysia subtitles entitled "[OUR ROAD OUR SAY - PAN BORNEO HIGHWAY STORIES](#)", which premiered on 14th October 2020. Due to the COVID-19 restrictions, the premier was held online, reaching 16,000 people with 4,900 views, both local and international. Feedback

was extremely positive, ranging from increased awareness about the PBH and its implications to requesting of more information on how to help. The film has also shown at the Youth and Public Forums and has continued to generate feedback. A poll of viewers reported that 100% had been inspired by the film, and that 84% felt that community development and environmental protection needed to be lead factors in infrastructural planning, with only 11% prioritising economic development over these.

In recognition of the value of working with young people with their fresh vision and future leadership, HHH partnered with University College Sabah Foundation (UCSF), a local tertiary education establishment with a strong green philosophy. This partnership has included the field studies of impacts of roads on soils and water in rice-fields and of roadkill quoted above, alongside preparatory work and co-hosting a three-day Youth Forum entitled *Envisioning Green Infrastructure for a Sustainable Future* in November 2020 whose live-streaming reached 3,667 with 1,314 views, which included presentations of greener alternatives by eleven teams of students, many of whom earned prizes. Groups of students presented their arguments and ideas under three key themes, namely 1) Philosophical & Conceptual Dimensions of Infrastructure Development, 2) Imagining & Visioning the Emerging Future of Infrastructure Development, and 3) Evidence-based Design of Infrastructure Development. Representatives from relevant professional organizations such as the Institute of Engineers Malaysia, Architects Association of Malaysia, Sabah Arts Gallery and Sabah Environment Protection Department were invited to serve as reviewers of the students' suggestions.



A subsequent Public Forum 'Envisioning Infrastructure Development for a Sustainable Future for Sabah' was then hosted in December 2020 which garnered 3,400 reach and 914 views and following a lively debate endorsed the key recommendation of a Joint Committee to bring stakeholders into the infrastructure planning process. To socialise and examine the legal aspects of the impacts of infrastructure development on society and the environment, two online roundtable discussions were held in May 2021, the

first “The EIA process – the Pan Borneo Highway Case” with guests from the legal sector, NGOs, government, researchers and EIA consultants and the second “Life Along the Pan Borneo Highway”, with guests from the private sector, academia, civil society and government. Issues with the EIA process were examined as well as the social impacts of the PBH and the impacts on elephants and other wildlife who live along the proposed route of the PBH through Tawai Forest Reserve in the Telupid area.

At the start of both sessions versions of the documentary film ‘Our Roads Our Say – Pan Borneo Highway Stories’ were shown, with the film edited to focus on the Tuaran – Kudat stretch and the Telupid stretch of the PBH respectively, followed by a facilitated dialogue with the roundtable guests. An invited audience also viewed the sessions and submitted questions to the roundtable.

Impacts of roadworks on Sabah’s paddy fields

BORNEO POST 12/10/21

KOTA KINABALU: Food security is imperative, especially when the country is struggling with the Covid-19 pandemic.

Prompted by this predicament, final-year students of University College Sabah Foundation (UCSF) visited some of Sabah’s largest ‘rice bowls’ to explore risks that potentially compromise rice production.

The loss of prime paddy land to infrastructure and housing development has long been lamented in Sabah, as has been the disruption caused to irrigation and drainage when roads run across valleys.

But the students looked at a more hidden concern: whether roadwork has any impacts on the soil and water chemistry of the paddy fields themselves.

According to the Third Sabah Agricultural Policy (SAP3), the average self-sufficiency level (SSL) for rice in Sabah is currently only 32 per cent, which is well below the target set by SAP2 of 60 per cent.

Federal and state governments continue to make major



A highway built across a paddy field in Papar. — Photo by Forever Sabah

leach into the paddy lands.

The risks may be spread through irrigation canals.

To assess roadwork impacts on soil and water quality, samples were extracted from the paddy fields to measure the usual variables for assessing safety and pollutants including pH, electrical conductivity, moisture content, organic matter, total

samples of Papar and Tambunan.

This may be caused by machinery traffic and steel used in the roadwork processes.

High levels of manganese and iron were also found in water samples from Kota Belud when compared to water samples of Papar and Tambunan.

Studies have shown manganese can originate from

acceptable and within the Class 4 threshold for agriculture irrigation of the Malaysian Water Quality Standard. Empirical data collected by the UCSF studies are expected to be valuable for informing the planners and roadwork contractors to deploy the necessary safeguards for protecting the critical ‘rice bowls’ of Kota Belud and Papar.

EIAs and *locus standi* emerged as important issues during the discussions and the following main points were summarised:

Pertaining to the EIA process:

- The EIA should come in earlier in the process especially before funding/ political commitment.
- Potentially separating EIA approval from Project Approval.
- Clearer legal guidelines on approval criteria.
- Better integration across various contradictory government policies and plans.
- Greater independent oversight of the process.
- Stronger oversight of enforcement of EIA recommendations and mitigation.
- Despite *locus standi* challenges there is a potential basis for legal action, including through public interest litigation.
- Public Engagement should be broadened – rooted in constitutional expansion.
- Rights of Nature/Broader view of Development would be powerful.

Pertaining to social impacts of infrastructure development:

- We cannot please everyone but we can do a lot better, and there ARE practical alternatives that are significantly less negative for people and for nature. For example, the impact on elephants of a Tawai Forest Reserve route would be catastrophic without modifications; and the scale of displacement along the PBH is unnecessary.
- Infrastructure development will be done better if it is less top down and we are able to gather the voices of the stakeholders, of civil society, and of youth; including those who can articulate the needs of nature. Public consultation in master-planning and project design is not easy but it is essential.
- Contractors must also take responsibility and be held to account for the impact of any delivery failures: they undertake technical studies to avoid this and hold insurance for these purposes.
- The approach to compensation that sees displacement only as a material issue to be resolved with money is much too limiting; human wellbeing is linked to place, memory, and a whole social and ecological ecosystem that which are destroyed by displacement in ways that money cannot solve. This is especially true for indigenous communities.
- Sabah needs to press for changes in how it receives its federal financial allocations so that they can be used according to the priorities and timetable of Sabah for projects of a wider range of sizes and purposes, for maintenance not just new construction, and for more flexible intervention over time.

The roundtable sessions were recorded and edited to be integrated into a two-part docu-series available online on our social media portals

8. LAWS AND POLICIES FOR INFRASTRUCTURE DEVELOPMENT

Sabah has in place many laws and policies governing infrastructure development and environmental protection that are relevant to balancing the environment and development, with some legislation having been amended by the Sabah Legislative Assembly periodically to be more effective.

Most of the unnecessary environmental destruction and displacement of people in the construction of the PBH would not have happened, or would have been effectively mitigated, if these laws and policies had been fully implemented. An effective strategy for realising the intent of these laws would be greater transparency and stakeholder participation in the initial planning process.

Below are the highlights:

(i) MAIN LAW AND STRATEGY FOR SABAH’S DEVELOPMENT

Law: Town and Country Planning Ordinance governs the grant of planning permission	Planning Ordinance. <ul style="list-style-type: none">• The Structure Plan is “the strategic policy” for “the general directions and trends of the physical development of the State” and “the policy and general proposals” for the development and land use.• One of the Visions: “A natural environment that protects, conserves and rehabilitates its terrestrial and marine biodiversity and ecosystem.” (Paragraph 2.3.1(a))
Law: Environmental Quality Act 1974 (federal) and Environment Protection Enactment 2002 (state) requires approval of Environmental Impact Assessment Report (EIA) or Proposal for Mitigation for prescribed activities.	<ul style="list-style-type: none">• Preferred Development Strategy: “Tourism strategy is the best matched strategy for Sabah... to shape Sabah’s growth for the next 20 years.” (Paragraph 3.3)• For “existing and future Protected
Policy: Sabah Structure Plan 2033 (SSP), “A long term strategic planning document that will guide and direct the State’s future physical growth and development up to 2033.” <ul style="list-style-type: none">• Gazetted into law in 2016 under Section 4E (4), Town and Country	

Areas", there shall be **"No development...** shall be permitted except for eco-tourism, research and education"; for "All other forests and wetlands outside of [Protected Areas] and [Priority Conservation Areas]", there shall be **"No development"** and **"No nett loss** of biodiversity in forest conservation landscapes." (Proposal EV3-1)

- "Where a **highway** cuts through the **forest connectivity** particularly if it is a national highway or strategic road; an overpass or underpass type of design shall be constructed to minimise the ecological impacts." **"Highways and roads** cutting through forest are regarded as one of the leading causes of **dissecting forest connectivity**. Being a State renowned for its rich forest resources, it is important for the State to consider

implementing road technologies that can minimise the environment impact by highways and roads." (EV2-7)

- "Environmentally Sensitive Areas (ESA) shall be identified and integrated into the District and Local Plans for better long-term management of the environment and natural resources." (Paragraph 14.3.3)

substantial financial injection from the government. However, SSP 2033 will plan a network of highway in accordance to projected growth.

(e) As Sabah is 70% covered with forest, constructing roads and highways across forested areas can be detrimental to the environment. There are different ways to connect roads from West to East, to avoid the forest reserves and environmentally sensitive areas. Tunnels, underpasses or elevated highways can be explored to create passages with minimal destruction to the protected forest corridors. The

(ii) CITIZEN ENFORCEMENT AND LOCUS STANDI

If the authorities are believed to have failed to act on a perceived breach of the law, any concerned private citizens who wish to enforce the environmental protection laws and policies through public interest litigation (primarily through judicial review) face the preliminary **obstacle** of the rule of standing (*locus standi*). Without *locus standi*, the court would not even hear the substance of the complaint (i.e. whether the public official has violated the law or government policy), because the claimant has **no right** to even sue in the first place.

There has been no publicly known litigation in this period to challenge the PBH development. However, it is reasonable to assume that those who have contemplated the option would have been **discouraged** by the rule of standing.

The rule is a judge-made law developed by judges. It focuses on the **messenger** (the claimant), rather than the message (whether there was unlawfulness. Although the rule appears to have been **relaxed** in recent years, especially since a Federal Court decision in 2014 for public interest litigation, the claimant still has to show that she is “*adversely affected*” and has a “*real and genuine interest*” in pursuing the claim. Cases from some commonwealth jurisdictions show that their substantially similar approaches are rather **subjective**, and therefore **unpredictable** in practice. The rule also effectively **restricts** the **access to justice** to a narrow segment of the society, contrary

to the equal protection of the law under the Federal Constitution.

We have examined the court judgments on the rule and found that, it is arguable that the rule **impedes** rather than promotes the rule of law. The justifications for the rule should be **re-examined**, and there are other **alternative options** available to control frivolous litigation even without the rule. Statute may be amended to confer standing on “*any person*”.

During the two online roundtable sessions, panellists coming from the government, civil society, the legal fraternity, EIA consultants, the private sector and academia, remarked that **Public Engagement** needed to be broadened in the enforcement of environmental law, perhaps rooted in Malaysian constitutional expansion that could even include the **Rights of Nature** and a wider view of what constituted development.



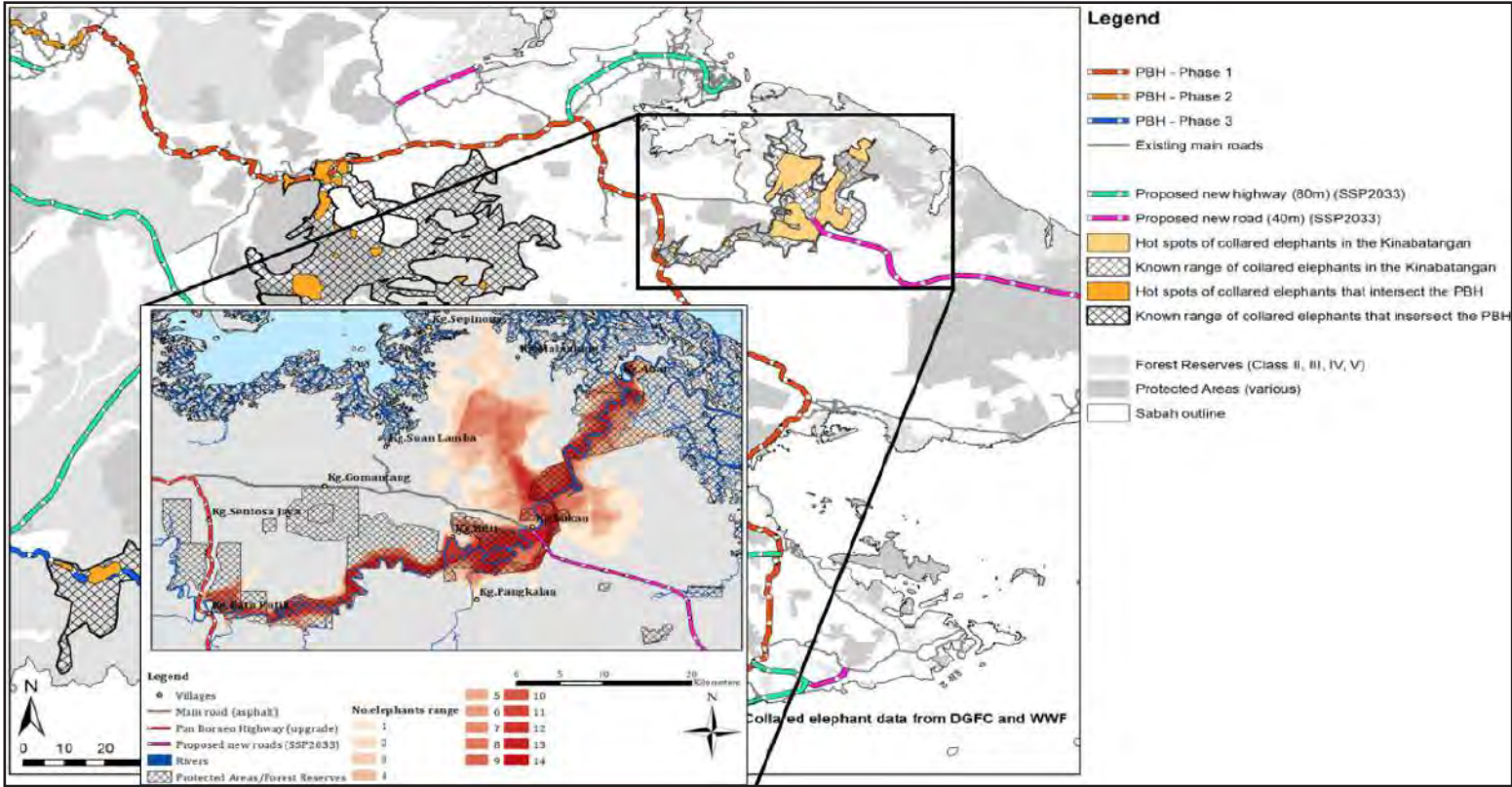
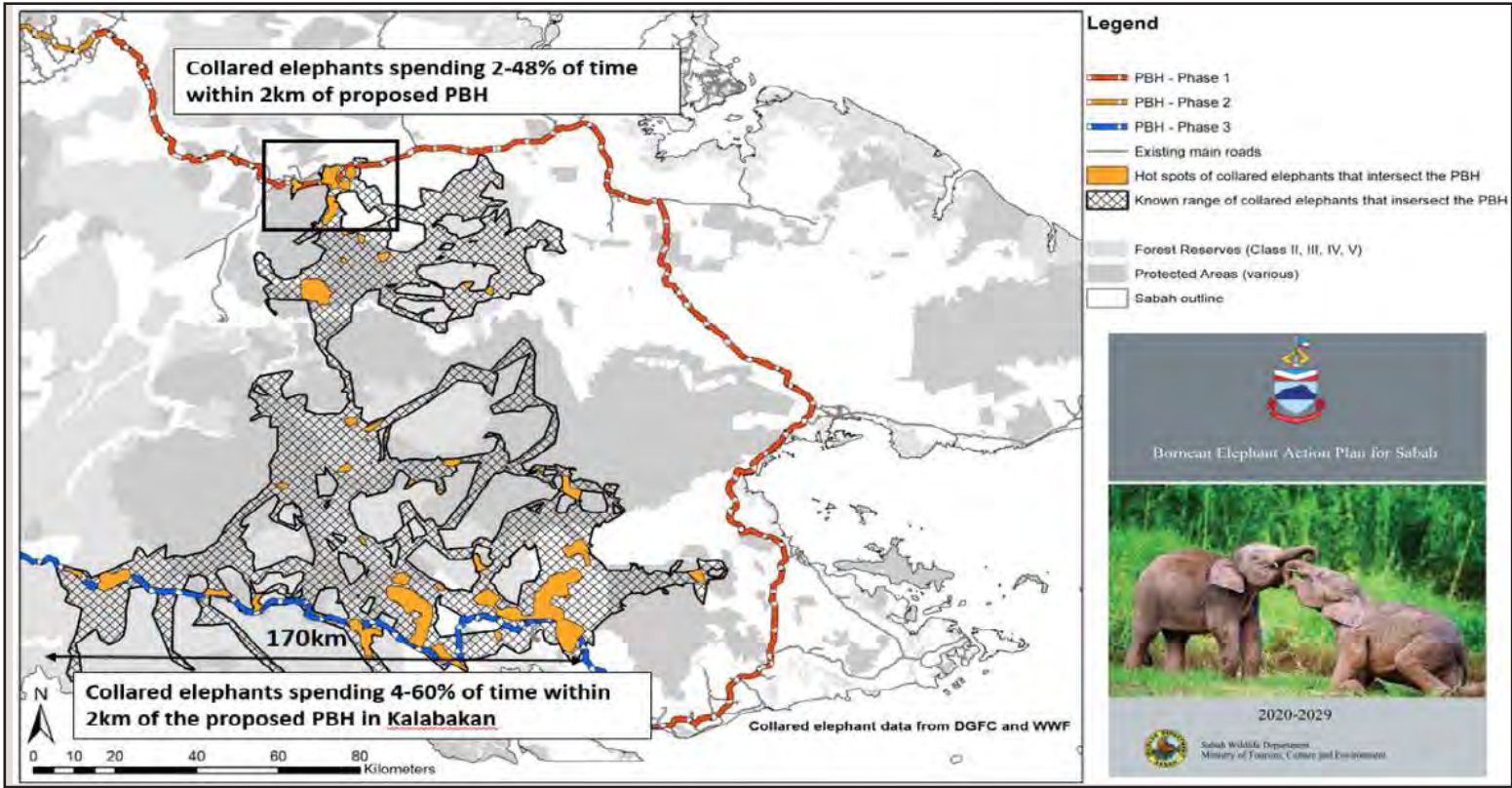
The challenge:

Only the Government can take action on breaches of environmental laws in Sabah, and where it lacks the capacity or interest in enforcing the law no action is possible through the courts except in cases where there are people (as opposed to nature) being directly impacted by the issue or where the claimant has “real and genuine interest” in the subject (which is something rather subjective).



9. STRENGTHENING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Environmental Impact Assessment (EIA) process is an essential and fundamental tool in Sabah (and worldwide) for managing unintended environmental consequences of major infrastructural projects. It is also one of the only ways that the concerned public can gain access to empirical information and routings for infrastructural development plans. We strongly support the role of the Environment Protection Department in the EIA process, and we and other stakeholders have identified a series of ways in which the EIA process could be strengthened (see Findings).



Findings on EIAs and the PBH

- Mega-Projects should be required to prepare of whole-project Special “Master EIAs”, not just discreet project package EIAs that look into only local issues. The EPD has the power to impose this requirement under the 2002 Enactment.
- EIAs are deployed too late in the process when the only option becomes mitigation though it is often cheaper and more effective to have made a better initial plan and avoided risky areas.
- Since EIAs have now become the last act before implementation starts - and long after political and financial commitments have been made - this makes it very difficult for any genuine environmental concerns to hold back a project without being seen as obstructing development
- The criteria upon which EIAs are approved, i.e. providing for the “protection of the environment”, should be elaborated by more objective, empirical criteria.
- Social Impact Assessments are rarely combined with Environmental Impact Assessment; current local consultation does not access useful feedback from local communities, let alone achieve Free, Prior and Informed Consent.
- The Environmental Protection Department (EPD) has insufficient staff and resources to monitor and enforce EIA provisions that are commonly not understood or followed by contractors; meanwhile the public and civil society lack easy access to relevant documents be able to help the EPD by identifying when EIA requirements are not being followed
- The Terms of Reference (ToR) for EIAs sometimes miss important issues like hydrological impacts, e.g. allowing tidal flow to keep mangroves alive and irrigation and drainage canals in paddy farming regions.
- Consultants undertaking EIAs may fail to identify potential impacts or suggest mitigating actions that are ineffective. Local communities are then left bearing the financial costs of these failures.
- EIA reports are not always published online for public comments, as it is not legally required to do so. Transparency would improve performance.

LEFT TOP MAP: Known elephant range of 20 GPS collared elephants (in black cross hatch) whose range intersects with the PBH either in Telupid or Kalabakan areas, with orange representing elephant’s hot spots or highly used

RIGHT BOTTOM MAP: Showing the Known elephant range and their hot spots for 14 elephants in the Kinabatangan population. This population will be impacted by the Sukau Bridge and subsequent road (pink) that will cut through the Lower Kinabatangan Wildlife Sanctuary and through Tabin. These maps show the cumulative impacts on elephants from the PBH and other proposed road/bridge developments. However, currently the EIA process does not look at the cumulative impacts of Infrastructure projects on species. (Elephant collared data from DGFC and WWF)

10. MOVING FORWARD TOGETHER

The HHH initiative looked broadly at the infrastructure development issue in Sabah, while using the Pan Borneo Highway as a case study and learning opportunity.

In the spirit of belief in our capacity as Sabahans to work together to find solutions for our state, this initiative did not seek to focus on uncovering and magnifying problems to complain about. Instead, HHH sought to understand the underlying patterns of issues and challenges so as to better reveal ways we can solve them more effectively. With infrastructure development we have found that the underlying truth is that prevention is better than cure. Rather than face conflict at the implementation stage, when our leaders often discover for the first time that a major issue has not been properly examined, or face unsolvable problems afterwards, the secret for success is in better early planning with more holistic, collaborative and transparent processes.

On this basis, we request the creation of a Joint Committee through which civil society, private sector and local community stakeholders can share their knowledge with government planners at an early stage in the infrastructural planning process.

In addition, we offer the following broader ways forward in four areas: improving planning, strengthening EIA assessments, improving social impacts and seeing the environment as an asset. The ideas in this section have been generated and brewed over many public consultations and private meetings over the last four years, and most especially by the two on-line Policy Dialogues held in May 2021 that brought together representatives and leaders from across Sabahan and Malaysian society to deliberate upon infrastructure planning and EIA strengthening issues, including in the light of the community assembled film “Our Road Our Say – Pan Borneo Highway Stories”.

IMPROVING PLANNING

Sabah and Malaysia could take full advantage of the knowledge of its researchers, civil society and local communities to ensure federal and state investments achieve the highest benefits while avoiding the worst problems; this can be achieved by establishing a Joint (inter-sector) Committee to contribute information and ideas early in the planning process.

Holistic and locally informed multi-stakeholder planning can find solutions for harmonising development and environment objectives (such that, for example, roads do not damage tourism potential or reduce state rice self-sufficiency); this requires early and full consultation with local stakeholders

A more engaged and less marginalized civil society could help mobilise federal funding for sustainable development

investments in Sabah, rather than opposing poorly conceived projects. Civil society could also call for improved balance in federal budget allocations between investment and maintenance and strengthen oversight of construction standards, so that, for example, new roads do not quickly fall into disrepair.

Sabah's Species Action Plans and other environmental policies could be respected fully in approvals of infrastructural development projects; Sabah could no longer approve major roads and other infrastructure in protected areas and endangered species' hotspots.



STRENGTHENING ENVIRONMENT IMPACT ASSESSMENT

Mega Projects have unintended impacts at large scales. Therefore, “Special” whole project “Master EIAs” are needed to identify and tackle those issues that cannot be addressed in individual Work Package EIAs. The EPD has the power to impose this requirement under the 2002 Enactment.

EIAs are too late in the project process to be fully useful; mitigation is often more expensive and less effective than avoiding high risk areas. Environmental and local social impacts could therefore be made integral to project planning and included from the start, so that these aspects do not wait until after project plans are fully developed and become an obstacle to implementation.

EIA Terms of Reference could be strengthened around identifying hydrological issues (drainage, flooding, siltation, tidal movements).

EIAs often neglect social impacts on local communities. Sabah could develop a Social & Environmental Impact Assessment (SEIA) approach that includes fruitful consultation with local communities rooted in Free Prior and Informed Consent (FPIC).

The Environment Protection Department (EPD) needs additional resources to monitor and enforce EIA provisions (assisted by civil society on the basis of greater EIA transparency); contractors and consultants could be held to account legally and financially for failures to identify issues, design effective mitigation, or to follow their approved EIAs.

Sabah could explore legal mechanisms to enhance enforcement of environmental law, such as transforming “*locus standi*” or establishing “rights of nature”.



IMPROVING SOCIAL IMPACTS

An early-stage consultative planning process could identify alternative sites or routes with lower social impacts to minimise displacement of local communities from their homes, communities, lands & livelihoods; and the SEIA would then fine tune and mitigate this impact at the final design stage.

The compensation and translocation process for those who do have to be displaced could be rendered more transparent and less disruptive; compensation could include covering buildings, and other improvements (such as orchards) for long term residents who lack land title.

Mega-projects could include, at the design stage, the creation of income earning opportunities for local communities (e.g. highways could establish parking and concession

areas for local produce sales and eateries rather than only lots for major commercial vending chains)



SEEING THE ENVIRONMENT AS AN ASSET

Sabah's natural assets could be recognised as its greatest comparative advantage economically as well as culturally; the environment could no longer be regarded as a special interest and an acceptable and inevitable "cost" to development. Instead planning could engage stakeholders in civil society, business and local communities to co-design development around the environment as a valuable asset. This concept of asset is recognised in the Sabah Structure Plan 2033, but has yet to be significantly considered in practise during implementation of the projects the Structural Plan identifies.

Alternative locations could be found for major projects instead of damaging Forest Reserves and endangered species hotspots (e.g. for Bornean Elephants and Proboscis Monkeys); where infrastructure projects are already implemented in such areas,

imaginative and effective mitigation measures could now be pursued.

Planning could recognise that infrastructure can drive habitat fragmentation so careful planning is needed around location and wildlife protection/crossing mitigation measures.



IN CLOSING

This four-year journey has revealed many layers and unravelled many tangles for us. We started out with righteous aims and ideals and have been humbled by the enormity and voracity of the dream and desire of development for a people and place. As civil society members, we aspire to contribute to society by bringing the best of our collective work to the table to support those in positions of power and responsibility to steward development into the future. We wish to see our relationships with the public and private sectors shift from distance and discomfort to dialogue and distributed democracy. We wish to target our energies and skills towards collaborative problem solving and solution building. We ask to be at the table. We hope that this report conveys our sense of true patriotism, multi-partisanship, and shared responsibility.





