Brunei Darussalam-Indonesia-Malaysia-Philippines
East ASEAN Growth Area
(BIMP-EAGA)

PRE-FEASIBILITY STUDY OF SABAH-NORTH KALIMANTAN CROSS-BORDER VALUE CHAINS

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Notes:
In this publication, "$" refers to United States dollars.
ADB recognizes "China" as the People's Republic of China.

Contents

Figures and Tables

Figures

Tables

Map of North Kalimantan and Sabah

Source: Adopted from Google Maps.

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Abbreviations

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BAPPENAS	Badan Perencanaan dan Pembangunan Nasional (National Development Planning Agency)
BIMP-EAGA	Brunei Darussalam–Indonesia–Malaysia–Philippines East ASEAN Growth Area
CIQS	customs, immigration, quarantine, and security
CPO	crude palm oil
EBCR	economic benefits–cost ratio
EIRR	economic internal rate of return
ENPV	economic net present value
EPU	Economic Planning Unit
ETP	Economic Transformation Program
FFB	fresh fruit bunch
FSC	Forest Stewardship Council
GDP	gross domestic product
GMS	Greater Mekong Subregion
HS	Harmonized System
MHTC	Malaysia Health Tourism Council
MPC	Malaysia Productivity Corporation
MWI	Malaysia Well-Being Index
NEM	New Economic Model
NKEA	national key economic area
PKO	palm kernel oil
PLBNs	pos lintas batas negara (state border checkpoints)
PSC	project steering committee
RBD	refined, bleached, and deodorized
RCA	revealed comparative advantage
RSUD	Rumah Sakit Umum Daerah (regional public hospital)
SDC	Sabah Development Corridor
SERF	shadow exchange rate factor
SMEs	small and medium-sized enterprises
SSP2033	Sabah Structure Plan 2033
SWOT	strengths, weaknesses, opportunities, and threats
TVET	technical and vocational education and training

Executive Summary

1. Study Scope

The people of North Kalimantan and Sabah share a 330-kilometer border and, because of poor road infrastructure, rely extensively on water transportation. Both governments plan to develop a border economic area spread over a wide geographic expanse. The area will cover the operation of a network of activities that encompass clusters associated in varying degrees of collaboration with transnational productive activities to achieve well-defined goals selected from a broad spectrum of development objectives that are unique to the Indonesian and Malaysian governments. To that end, the governments of the bordering territories are designing sound implementation plans that will benefit both sides.

This study maps the optimal configuration of North Kalimantan–Sabah cross-border trade and investment in goods and services; and, concurrently, it provides a preliminary (pre-feasibility) design of a border area development plan for the two territories. The options for moving project proposals forward are elaborated with sufficient detail, and they contain concrete measures needed to move through subsequent stages of development into the final implementation and operational phases.

We define the optimal configuration for the portfolio for North Kalimantan–Sabah trade and investment activities as that which generates the maximum net benefits from the feasible projects for a set of stakeholders. In addition to the application of traditional cost–benefit analysis that measures the monetarized returns to projects, we elaborate a theory-consistent approach to introducing nonmonetarized project appraisals. The approach is particularly apposite for the new Sustainable Development Goals that include preference objectives for such features as environmental protection, meeting the population's basic needs, health and well-being, reduced inequality, and economic growth.

The sub-aim of the study is the application of cross-border value chains, based largely on the spread of integrated global production networks. These value chains also take advantage of the massive infrastructural investments that are currently underway in both North Kalimantan and Sabah. This type of production sharing has been largely driven by efforts to exploit either differences in factor endowments or possible scale economies of production activities across areas. In the North Kalimantan–Sabah context, the spatial concentration of industries along the border region combines the traditional growth area model of trade and investment, based on comparative advantage and complementarities, with one based on scale economies from regionalization of production activities.

Clustering of industries across the neighboring countries then allows producers to bypass the need to handle the entire production process, and instead concentrate on processing stages. These complementarities permit the exploitation of differences in the factors of production

in subregions and generate economies of scale and "cross-hauling" or two-way trade between the neighboring countries, thereby increasing the competitiveness of border industries in regional and global markets.

There are six objectives to the study. The first is to analyze existing trade patterns between Sabah and North Kalimantan and the competitive advantages of the two territories. The second is to propose a border economic area spread over a wide geographic area that covers a network of interrelated activities. The third is to investigate a range of cross-border trade and investment opportunities in specific goods and services that can serve as high-profile, demonstrable projects for the border economic area. The fourth is to determine the preference orderings of project features by key stakeholders such as government and development partners, commercial entities, and the local population. The fifth is to estimate the net monetary returns for the project portfolio, rank stakeholders' nonmonetary preferences, and incorporate the latter results into the net monetary returns. And the sixth is to provide an overall program appraisal for the set of projects, including an impact analysis of connectivity options.

2. Pre-Feasibility Study Components

This pre-feasibility study follows standard international practices for the steps needed to carry out such an analysis: First, it conceptualizes the interrelationship between different cross-border components that are needed to make the program successful in reaching well-defined objectives specified by the governments of Indonesia and Malaysia. Second, it determines the key project parameters in terms of location, financial requirements, technical support needed, gains to major beneficiaries, preliminary cost estimates, financial and economic feasibility, and implementation program and time line. As such, it largely focuses on methods to maximize the benefits from each program component in conjunction with an in-depth analysis of project parameters that are needed to make the overall integrated program successful.

3. Economic Profiles

The geographic areas of Sabah and North Kalimantan are approximately equal to one another. But North Kalimantan's population density is only 9 persons per square kilometer (km^2), one of the lowest among Indonesia's provinces, whereas that of Sabah is 52 persons/km^2. Their gross domestic product (GDP) also differ considerably. North Kalimantan's provincial GDP is $5,020 million, while Sabah's state GDP is over three times greater at $15,900 million. Nonetheless, North Kalimantan's per capita income ($7,300) is nearly two-thirds larger than that of Sabah ($4,500).

The two geographic areas have a long history of trade and cultural ties, which explains the ease with which people from the two territories interact with one another. They also concentrate their productive activities on similar industries, though at different stages of the value chain.

Sabah – Sabah is the fourth largest contributing state to the overall economy of Malaysia, following Selangor, Sarawak, and Johor. Its economic output profile is a mix of traditional activities and readiness for the future of production.

- *Services:* Services contribute 40% to the state's GDP, and the remaining contributions are based on the primary sectors of agriculture, forestry, and petroleum. Tourism-related industries contribute 10% to GDP, with ecotourism an increasingly important activity for the state.
- *Goods Industries:* The petroleum industry is mainly located in the west coast of the state. Palm oil and fisheries are the largest economic activities in the area bordering North Kalimantan. In fisheries, the aquaculture and marine fish cage sector are growing in importance, and the seaweed industry has experienced a strong, albeit unstable, growth.

North Kalimantan – North Kalimantan was formed in 25 October 2012. Prior to that date, it had consisted of the four most northerly regencies in East Kalimantan. As the youngest Indonesian province, North Kalimantan is at an early stage of development. As such, its economic takeoff is being led by a relatively few industries:

- *Product Industries:* Production is concentrated on abundant resources of minerals (coal, gold, oil and gas, and limestone and quartz), forestry (9.3 million acres), agriculture (oil palm, rubber, coconut, rice, cocoa, pepper, and coffee), and fisheries (capture fisheries and fish farming).
- *Services:* Tourism is an important source of revenue for the province and its potential growth is enormous, if industrial development is rationalized into high-value industries that do not depend on the extraction or exploitation of natural resources.
- *Exports:* Exports focus on a few unprocessed products, specifically crude palm kernel, bituminous coal, fish and crustaceans, crude palm oil, sawn wood, wood panels, plywood, and fresh and frozen fish and crustaceans.

4. Government Objectives

In the case of North Kalimantan, the goal is to accelerate economic growth, reduce poverty and inequality, and attract skilled workers and technicians from the country's megacities. In this *takeoff stage of development*, North Kalimantan has an abundance of natural resources and is poised to deliver basic agricultural, forestry, fishery, and mining products needed by Sabah in exchange for technology and knowledge transfers that can be gleaned from engagement in cross-border value chains. Nevertheless, the government wishes to develop tourism, especially ecotourism, and therefore wishes to minimize any negative impact from the development of its resource-based industries. It is therefore focusing on moving industrial activity toward downstream activities and supporting them with a skilled labor force, having the necessary expertise in targeted growth industries.

In the case of Sabah, the objective is to transform Sabah from its primary commodity export dependence into an economy driven by high-technology industries and service-based activities. In its *drive to maturity*, the Sabah State Government seeks to expand productivity and skilled labor as a means of expanding economic growth. Development of air, road, and rail connectivity in the state aims to support designated geographic areas for manufacturing activities, agri-food processing, and tourism and medical tourism; and downstream activities for the palm oil, livestock, agriculture, and aquaculture industries.

5. Economic Analysis of Traded Goods

Sabah and North Kalimantan have complementary economies. In traditional trade, they each have comparative advantages in a different range of products; and, in the context of modern trade theory, they focus on trade in similar goods, giving rise to intra-industry trade and network effects from the use of goods and services.

Sabah's exports are more diversified than those of North Kalimantan. The state produces petroleum and petroleum products, vegetable oils and fats, organic chemicals, wood, wood manufactures, processed vegetable oils and fats, fish and crustaceans, iron and steel, and machinery. In contrast, North Kalimantan's activities are highly concentrated in two broad categories: vegetable products and mineral products, which together account for 94% of total exports. Food and food products, and wood and wood products represent nearly all the remaining 6% of exports.

Comparative Advantages: North Kalimantan's exports reveal that it has a comparative advantage in palm kernels and crude palm oil, coal, shrimp and other crustaceans, and wood and wood panels. Sabah has a comparative advantage in the production and export of natural resource intensive and unskilled-labor intensive products. The areas where Sabah's exports are revealed to have a comparative advantage are in the exports of palm oil products, crustaceans, and processed wood.

Competitiveness: One of the major macroeconomic determinants of trade and cross-border investments is international price competitiveness. Since 2010, Malaysia's real cross-rate of the ringgit against the rupiah has trended upward, suggesting a real exchange rate depreciation that represents an improvement in export competitiveness. In contrast, Indonesia's rupiah has strengthened somewhat against the ringgit in real terms, resulting in a deterioration in North Kalimantan's export competitiveness relative to Sabah and the rest of Malaysia. It is noteworthy, however, that movements in the bilateral real exchange rate have stabilized in 2016 and this change may signal a change in the medium- to long-term competitiveness of exports from Sabah and North Kalimantan.

6. Economic Analysis of Traded Services

The three services industries with potential cross-border trade opportunities between Sabah and North Kalimantan are medical tourism, private technical and vocational education and training (TVET) and higher education, and general tourism. Sabah is a provider in all three industries, while North Kalimantan is a potential recipient of the first two and a strong contender for multi-destination tourism partnerships with Sabah, assuming that connectivity improvements occur in the near future.

Medical Tourism: Over 80% of Malaysia's inbound medical travelers are from Indonesia, which places Sabah in a premier location bordering North Kalimantan. Yet the medical tourism industry in Sabah is at its infant stage of development. Many of the private hospitals are new and have not yet received widespread international exposure to medical tourists. Nevertheless, they are highly price-competitive, contain state-of-the-art medical facilities, and have received both national and international accreditations. In contrast, medical

facilities in North Kalimantan offer basic services. The province has a total of eight hospitals, seven of which belong to the public sector.

Private TVET and Higher Education: Malaysia's Higher Education Blueprint 2015–2020 targets a 2.5-fold increase in TVET enrollment, which represents a major challenge for Sabah, given the low attraction that TVET programs have, compared with academic degree-based programs. It will require a mindset change, not only for potential students, but also for policy makers to make TVET and academic pathways equally valued. Indeed, there is already a large supply deficit of TVET graduates in Malaysia's 12 national key economic area (NKEA) sectors, which include the palm oil, tourism, financial services, electronics, business services, communications content and infrastructure, education, agriculture, oil and gas, wholesale and retail trade, and health care industries.

Multi-Destination Tourism: A North Kalimantan–Sabah arrangement could help stakeholders in both territories to gain a competitive edge and thus enhance sustainability if they can package and market their various attractions more cohesively. North Kalimantan, as a relatively new province, lacks technical expertise in tourism development, has scarce financial resources to promote tourism, and has limited infrastructure to support the industry. Likewise, Sabah has a very modest visitor advertising budget, and needs to increase expenditures considerably if it is to achieve any acceleration of visitors from its existing modest growth.

7. Program Design

The Sabah–North Kalimantan cross-border trade and investment initiative needs to be grounded on a comprehensive plan of action that conceptualizes and operationalizes a strategy and action plan driven by a set of flagship projects to serve as high-profile entrepreneurial successes. The plan is embodied in the Sabah–North Kalimantan Border Economic Area Program.

The Sabah–North Kalimantan Border Economic Area Program specifies the mission, vision, and strategic plan, describing what stakeholders want to accomplish over a medium- to long-term period (*strategic plan*). From a practical perspective, it lays out the channels, institutions, and other components that stakeholders will experience once the program is operationalized (*master plan*). Finally, it describes how the program will be implemented in close consultation with government officials and representatives of the private sector and local communities (*action plan*).

The investment program comprises (a) development of cross-border value chains between Sabah and North Kalimantan in palm oil, wood products, fisheries, and organic foods; (b) promotion of Sabah–North Kalimantan tourism complementarities; (c) establishment of Sabah as a leading medical tourism center; (d) expansion of international private TVET and higher education aligned with Sabah's needs; and (e) capacity-building support for Sabah and North Kalimantan.

Key program features are as follows: First, it focuses on the socioeconomic development of the two territories with a poverty-based focus. Second, it lays out a pragmatic and sector-focused implementation approach to ensure that commercial, social, and environmental interests are advanced. Third, it concentrates on a relatively few high-profile initiatives that have direct links to key strategic aims of the private sector and objectives related to social, environmental, and multimodal transport development. These so-called flagship projects are to produce a large,

demonstrable impact for others to follow in the core development areas of agri-industry, fisheries, tourism, education and training, and infrastructure.

8. Cost–Benefit Analysis

We use cost–benefit analysis to measure the economic viability of cross-border trade and investment between Sabah and North Kalimantan. It is the reference method used to compare alternative options based on their monetary values.

Project economic analysis involves examining (i) current and future demand, (ii) existing sources of supply and their costs, (iii) the contribution of the proposed project to overall market demand, (iv) the benefits to be derived from the project, and (v) the sustainability of the project during its lifetime.

In development projects, it is important to balance efficiency, equity, and non-efficiency concerns. Monetarization of net benefits makes it easy for cost–benefit analysis to determine the *efficiency* of a project. Such efficiency promotes economic growth, diversity of products and services, and greater innovation and creativity. However, broader public policies, interests, strategies, and policies dictate the need to incorporate equity and non-efficiency considerations. *Equity* and distributional concerns can be measured separately in cost–benefit analysis through metrics of employment, wages and salaries, and household incomes.

The project analyses yield the following results:

- For Sabah, the economic internal rate of return (EIRR) ranges from 18% to 22% for palm oil, fisheries, medical tourism, private TVET, and higher education. The wood products project produces a much lower EIRR of less than 4%. The economic net present values (ENPVs) are highest for medical tourism (nearly $250 million) and palm oil ($114 million). The economic benefits–cost ratio (EBCR) ranges from 1.7 to 2.9 for the economically viable projects.
- For North Kalimantan's projects, the EIRR ranges from 17% to 26% for palm oil, fisheries, and wood products. The ENPV is highest for wood products ($230 million). The EBCRs range from 1.5 to 2.5. Tourism, particularly ecotourism, and organic foods would require a combined value of technical assistance of $4.5 million to $6.5 million for their development.

9. Nonmonetarized Project Appraisal

Traditional cost–benefit analysis is concerned with quantifying benefits and costs in monetary terms and determining the best way to conduct a given project. What is more difficult to capture is nonmonetarized benefits or costs that represent *non-efficiency* concerns such as environmental protection, meeting the population's basic needs, and small businesses development. To address *non-efficiency* objectives, we need to adopt an iterative process of interdisciplinary consultations. This approach is now being widely adopted to meet the 17 Sustainable Development Goals. At the Sabah state and the North Kalimantan provincial levels, this process involves a participatory appraisal process in which all stakeholders are interviewed and the results are used to identify priorities, weigh tradeoffs, and harmonize interests.

We examine three groups of stakeholders that have different preferences for key characteristics or aspects of a project. The first consists of government and development institution stakeholders whose objective is to maximize both the commercial viability and socioeconomic welfare effects of a project. The second stakeholder group consists of large domestic and international companies whose main interest are the project characteristics that help them generate the largest commercial returns. And the third stakeholder group is composed of local households and small businesses that are concerned with project aspects that improve their livelihoods and access to health care, business development services, and transport systems, while alleviating poverty and improving income distribution.

The results of the analysis and ratings for these non-efficiency objectives are incorporated into the results of the monetarized cost–benefit analysis through scaling factors. The methodology involves using a weighting factor >1 for projects with high non-efficiency rankings in the program, and weighting by a factor of <1 those project with low rankings for a given stakeholder group.

10. Overall Program Appraisal

Since the Sabah–North Kalimantan border economic area program is composed of several projects, we can jointly analyze the entire program as a single investment and evaluate its economic viability accordingly. A common implementation time frame is used and duplicate capital and operating costs for factor inputs or infrastructure are counted as costs that are common to selected projects.

The following results show that Sabah and North Kalimantan benefit by about the same economic rate of return and economic benefit–cost ratio:

- For Sabah, the analysis of the overall program indicates an EIRR of 22.6%, with the ENPV equal to $547 million. The EBCR is 1.9. Sensitivity analysis suggests that the program remains economically viable in the face cost overruns, benefits reductions, and a combination of both effects.
- For North Kalimantan, the overall program has an EIRR of 22.1%; an ENPV of $318 million; and an EBCR of 2.0. Sensitivity analysis also indicates that the program remains viable under alternative assumptions.

The existence of common factor input and infrastructure costs across projects give rise to economies of scale that are otherwise nonexistent within individual projects. Such is the case with the construction of the paved road on the Sabah side, from the border town of Serudong to the town Kalabakan, located on the paved road linking the city of Tawau to the Interior District. The Serudong–Kalabakan paved road would contribute $223 million to Sabah's cross-border merchandise exports; and it would contribute $256 million to North Kalimantan's cross-border merchandise exports over the project time frame.

11. Moving Forward

The transformation of simple border crossings into full-fledged border economic areas will require an integrated spatial planning approach that extends well beyond purely local or district policies. Moreover, development on one side of the border will, sooner or later,

need collaboration with adjacent territories. Efforts are already underway to establish quasi-formal trading arrangements between Sabah and North Kalimantan.

Moving forward from this study, the next step would involve a full-fledged feasibility study with detailed costing and benefits for each flagship project. Program execution would then follow under well-defined management and supervision, with periodic reviews and a monitoring and evaluation (M&E) framework. In all cases, the path forward should follow a fully integrated approach to the border economic area design and implementation.

PART I

Introduction

Summary

The governments of the Malaysian state of Sabah and the Indonesian province of North Kalimantan are exploring trade and investment opportunities between their territories. The people of North Kalimantan and Sabah share a 330-kilometer border and, because of poor road infrastructure, rely extensively on water transportation. Both governments plan to develop a border economic area spread over a wide geographic expanse. The border economic area will cover the operation of a network of activities that encompasses clusters associated in varying degrees of collaboration with transnational productive activities to achieve well-defined goals selected from a broad spectrum of development objectives that are unique to the Indonesian and Malaysian governments.

In the case of Indonesia, the goal is to accelerate economic growth, reduce poverty and inequality, and attract skilled workers and technicians from the country's megacities. In this *takeoff stage of development*, North Kalimantan has an abundance of natural resources and is poised to deliver basic agricultural, forestry, fishery, and mining products needed by Sabah in exchange for technology and knowledge transfers that can be gleaned from engagement in cross-border value chains.

In the case of Malaysia, the objective is to transform Sabah from its primary commodity export dependence into an economy driven by high-technology industries and service-based activities. In its present *drive to maturity*, Sabah seeks to expand its productivity and skilled labor as a means of expanding economic growth. Development of air, road, and rail connectivity will support designated geographic areas for manufacturing activities, agri-food processing, fisheries, tourism, and medical tourism; as well as downstream activities for the palm oil, livestock, agriculture, and aquaculture industries.

This study maps the optimal configuration of North Kalimantan–Sabah cross-border trade and investment in goods and services; and, concurrently, it provides a preliminary (pre-feasibility) design of a border area development plan for the two territories. In the context of the pre-feasibility study, the optimal configuration for the portfolio of North Kalimantan–Sabah trade and investment activities is that which generates the maximum net benefits from the set of feasible projects for a set of stakeholders. As such, the first objective of the study is to identify existing trade patterns between Sabah and North Kalimantan, and investigate cross-border trade and investment opportunities. The second is to determine the optimal composition of those projects, based on estimated net returns from the potential trade and investment activities between North Kalimantan and Sabah. The goal is to determine the optimal cross-border trade and investment portfolio for the two territories for the preference ordering of their stakeholders.

1

Background

1.1 Situation Analysis

Mutual Collaboration Interests

The governments of the Malaysian state of Sabah and the Indonesian province of North Kalimantan are exploring trade and investment opportunities between their territories. The people of North Kalimantan and Sabah share a 330-kilometer border and, because of poor road infrastructure, rely extensively on water transportation. Both governments plan to promote cross-border trade and investment by introducing hard and soft infrastructure that include roads and customs and immigration facilities along the border, as well as trade and transport policies and regulatory measures that promote cross-border collaboration.

At the center of these efforts is a border economic area spread over a wide geographic expanse. Instead of a narrowly defined special economic zones, a border economic area covers the operation of network of activities that encompasses clusters associated in varying degrees of collaboration with transnational productive activities to achieve well-defined goals selected from a broad spectrum of development objectives. In the case of Indonesia and Malaysia, each government has different, but complementary, development objectives for the North Kalimantan–Sabah network of activities.

Development Objectives

For the *Government of Indonesia*, the objectives are delineated in the government's 2016 border economic area program.[1] That program aims to lower poverty levels in the country's border regions, bolster their economic growth, and encourage the movement of people toward those areas and away from the country's megacities of Jakarta and Surabaya. Faster economic growth is to be achieved from increased productivity associated with economies of scale and production complementarities with neighboring countries like Malaysia, while reduced poverty and lower inequality is to result from greater employment and more value-added activities along the borders. As the country's newest province, created in 2012 from the East Kalimantan provincial territory, North Kalimantan has been designated as the first border economic area to be operationalized because of the territory's resource wealth, rapidly growing population, and geostrategic position as a gateway for trade with Malaysia.

For the *Government of Malaysia*, the objective is to transform Sabah from its primary commodity export dependence into an economy driven by high-technology industries and service-based activities. For that transformation to occur within the medium term, Sabah needs to access North Kalimantan's raw materials and open its markets to that

[1] Asian Development Bank (ADB). 2017. *Indonesia's New Border Economic Area Program*. Manila.

province's rapidly growing population that currently has one of Indonesia's highest per capita income levels.

The strategy reflects Malaysia's most recent development plan, that is, the Eleventh Malaysia Plan, which builds on the so-called National Transformation Policy 2011–2020 and which itself focuses on the implementation of the New Economic Model (NEM). The NEM has seven strategic targets, two of which are central to Sabah's transformation. The first is the expansion of productivity as a means of expanding economic growth, and the second is the development of skilled labor. Productivity expansion involves shifting away from earlier government-driven initiatives to instead target actions across the public sector, industry players, and individual enterprises.[2] Skilled labor development will drive the acceleration in economic growth and better align knowledge and skills with industry requirements and enhanced technical and vocational education and training services. These broad-based actions are being complemented by the Sabah Development Corridor, which has six strategic development areas covering tourism, energy, livestock, research and development, marine resources, palm oil, and oil and gas. More recently, the Sabah Structure Plan 2033, launched in October 2016, contains a detailed strategy for development of air, road, and rail connectivity in the state; sector strategies for industrial zones of manufacturing activities, agri-food processing, fisheries, general tourism and health tourism, as well as downstream activities for the palm oil, livestock, agriculture, and aquaculture industries.[3]

North Kalimantan's Takeoff Stage of Development

North Kalimantan is poised to deliver the needed resources to support Sabah's manufacturing expansion, as well as for its people to become significant consumers of Sabah's international educational and medical tourism services. It is rich in natural resources and has a growing labor force, a substantial portion of which is seeking employment in Sabah. The province is about the same size as Sabah. Its relatively small population of 700,000 is the fastest growing population of any Indonesian province, and its average per capita income is two-thirds higher than that of Sabah state. The province has an abundance of mineral, agricultural, fishery, and forestry resources, with leading exports of shrimp, wood products, coal, and crude palm oil. Malaysians have invested in several of these industries, especially oil palm plantations. But there is still considerable room for development of cross-border value chains, especially in shrimp, wood products, and all types of agricultural goods. For their part, North Kalimantan businessmen view these arrangements as a way of acquiring new technologies and know-how to move up the value chain.

Sabah's Drive to Maturity

Sabah is undergoing rapid diversification as Federal Government funds to the state are channeled to rural areas, transportation and other infrastructure, and sectors like manufacturing, tourism, and agriculture. Sabah's services now account for over 40% of the state's gross domestic product (GDP), compared with 36.5% at the beginning of this decade; agriculture's contribution has fallen from 27% to 22.5% in the same period; and mining adds 26% to output compared with 24% in 2010.[4] Exports nevertheless remain highly concentrated,

[2] Government of Malaysia. 2015. *Eleventh Malaysia Plan 2016–2020: Anchoring Growth on People*. Kuala Lumpur. http://www.epu.gov.my/sites/default/files/Chapter%201.pdf.
[3] Town and Regional Planning Department, Sabah. 2016. *Sabah Structure Plan 2033*. Kota Kinabalu, Sabah.
[4] Department of Statistics Malaysia. 2016. GDP by State: National Accounts, 2010–2015. Sabah.

with crude petroleum currently contributing 40% of total export earnings, and palm oil and palm kernel oil representing 35% of the total.[5]

While manufacturing activities account for less than 10% of its total output, the state government's Sabah Structure Plan 2033 expects the sector's share of GDP to increase to as much as 25% by 2025.[6] To reach this target, the government is emphasizing the development of high value-added manufacturing activities such as premium sustainable palm oil-based biochemical and biomaterials, as well as high quality foods. The establishment of industrial estates and special economic zones along the border with North Kalimantan could contribute to that process.

Cross-Border Labor Movements

Much of North Kalimantan's labor emigrates to Sabah for contract work. Migrants in Sabah represent about 40% of the total in all of Malaysia and, within Sabah, foreign workers account for half of the total workforce.[7] Because contract workers often bring their family members with them, social services in public education and health institutions are being strained far beyond their capacity in the southeast region of the state.

Entry into Sabah by workers from North Kalimantan is largely through Tawau division, particularly the ports of Tawau Semporna, Kunak, and Lahad Datu, while Filipino migrants mainly enter via Sandakan. Since the amount of oil palm area planted in the districts of Tawau and Sandakan account for 95% of the state's total oil palm plantations, the demand for migrant workers in these areas is high, with the result that 85% of the total foreign population in Sabah is now located in Tawau and Sandakan.

1.2 BIMP-EAGA Context

Since implementation of the Association of Southeast Asian Nations (ASEAN) Economic Community at the end of 2015, both Sabah and North Kalimantan have been consolidating their economic integration in the region and seeking to expand trade ties between themselves and with neighboring countries, particularly in the Brunei Darussalam–Indonesia–Malaysia–Philippines East ASEAN Growth Area (BIMP-EAGA). These initiatives reflect government and private sector interests in diversifying their economies and developing complementary production activities that generate economies of scale and allow industries to move into high-value markets.

New infrastructure developments underway between Sabah and North Kalimantan will support those efforts and lay the groundwork for possible transboundary supply chains. Road connectivity between Sabah and North Kalimantan may be enhanced by a proposed road connecting Kalabakan in Sabah to Simenggaris in North Kalimantan.[8] The Asian Development

[5] Department of Statistics Malaysia, Sabah. 2016. External Trade Statistics: Sabah: 2016. Other significant exports are plywood (3% of total 2015 exports), methanol (3%), prawns (1%), paper (1%), iron (1%), and sawn timber (1%).

[6] Town and Regional Planning Department, Sabah. 2016. *Sabah Structure Plan 2033*. Kota Kinabalu, Sabah.

[7] Syed Abdul Razak Bin Sayed Mahadi. 2014. Indonesian Labour Migration to Sabah: Changes, Trends and Impact. Adelaide, South Australia. Thesis submitted for degree of Doctor of Philosophy. University of Adelaide. School of Social Sciences.

[8] ADB. 2016. Consultation Mission for the Proposed Kalabakan–Serudong Road in Tawau, Malaysia on 21–23 November 2016. Back-to-office report. 14 December (internal).

Bank (ADB) is providing technical support to the $160 million project with construction of the road infrastructure and a customs, immigration, quarantine, and security complex on the Sabah side. In power interconnection, North Kalimantan is set to become an efficient power center for the region, and there are plans to interconnect the province's transmission system with eastern Sabah.

1.2 Study Origins

At the stakeholders' kick-off meeting organized by the Sabah State Planning Agency in October 2016, the State Government of Sabah requested that ADB carry out a pre-feasibility study on opportunities in cross-border trade and services in the areas of medical tourism and private higher education, as well as a rapid assessment of connectivity with North Kalimantan. In cross-border trade, the stakeholders asked that the ADB identify possible competitive and complementary industries where Sabah and North Kalimantan could expand their bilateral trade and investment activities.

In subsequent meetings by ADB officials, the Government of Indonesia requested that the study explore cross-border trade opportunities between North Kalimantan and Sabah, especially efforts that could lead to the establishment of a border economic area. The application to North Kalimantan is to be a high-profile, demonstration case study for the government's new program to develop specific border economic areas with its neighboring countries of Malaysia, Timor-Leste, and Papua New Guinea. The border development concept refers to the new economics of geography and its inclusive socioeconomic approach to border area advancements.[9]

[9] ADB. 2017. *Indonesia's New Border Economic Area Program*. Manila.

2

Historical Connections

2.1 Early History

North Kalimantan and Sabah have a long history of trade and cultural ties. The early history of north Borneo dates back 200,000 years from stone tools found in Bingkor Keningau in the present-day Interior Division of Sabah. Early human settlement by the Australoid (Negrito) people began 20,000 to 30,000 years ago. Then, around 5,000 years ago, the Australoid became extinct or assimilated with migrating Mongoloid people originating from the Asia mainland. Their arrival marked the beginning of the Kadazan Duzun and Murut race in Borneo.

In the early 6th century CE, the Kingdom of Poni appears in writings by Chinese navigators and is thought to have extended from present-day southwest Sabah, Brunei Darussalam, and northwest Kalimantan. In the 7th century the Poni Kingdom was invaded by both the Buddhist Kingdom of Srivijaya from Sumatra and the Majapahit empire from central Java. The Poni Kingdom nevertheless managed to remain in power for several centuries, and eventually it became a vessel state of Majapahit in the 14th century.

The Sultanate of Brunei Darussalam ruled from the 14th century to the 19th century. Its territory covered the northern part of Borneo and southern Philippines. Under the Sultanate, trade flourished and cultural ties among people in the region were strengthened through intermarriages of the native peoples. The Sultanate gave the territory east of Sabah to the Sultan of Sulu in gratitude for help given to end a rebellion in 1658. As a result, it split the geographic area of present-day Sabah and North Kalimantan down the middle eastern third of north Borneo.

2.2 Dutch and British Period

The Dutch and British gained a footing in Borneo in the early 17th century. The Dutch began to trade on the west coast in 1604, and the British appeared around 1609. By 1698 the British had established a settlement at Banjermassin in South Kalimantan. But they were soon expelled by the Dutch, who thereafter dominated the southern and western Borneo coastal areas.

The British turned their attention to the north after being driven from South Kalimantan by the Dutch, and in 1756 they gained possession of the northeastern island of Balangbangan. A military post was established, but it was destroyed in 1775 by the local natives who were dissatisfied with the cession of their territory.

In 1865 Claude Lee Moses, an American consulate, leased north Borneo from the Sultan of Brunei Darussalam for a 10-year period. He later sold the leasing rights to the American Trading Company. It was later sold and the lease renewed by the Austria–Hungary consulate

in Hong Kong, China, who subsequently renewed the lease from the Temenggong of Brunei. The lease was finally sold in 1878 to the British, who formed the North Borneo Chartered Company. The company also leased the northeastern part of present-day Sabah, which at the time was under the reign of the Sulu Sultanate.

North Borneo became a British protectorate in 1888. The North Borneo Chartered Company managed the territory until 1942, when the Japanese landed in Labuan. They occupied north Borneo until 1945, when it was liberated by Australian Imperial Forces. North Borneo became a British colony after 1945 since the North Borneo Chartered Company was unable to rebuild the territory, especially after the complete destruction of Sandakan town. In the 1960s, national consciousness led to the independence of north Borneo.

The spread of the Dutch sphere of influence in southern and eastern Borneo began with their restoration of authority in Java in 1816. A series of treaties, culminating with a treaty in 1817 with the Sultan of Banjarmasin, established Dutch sovereignty over southwestern Borneo. Then, in the 1830s, the Dutch claimed the more northerly Tidung region, which had previously been regarded as vassal to the Sultan of Sulu.[10]

The British and Dutch concluded agreements in 1824 and 1871 delimiting their spheres of interest in the region. Most of Borneo was allocated to the Dutch East Indies, while the North (Sarawak, the Sultanate of Brunei, and North Borneo) went to the British. Sarawak had been granted as a fief in 1841 to James Brooke and continued to be ruled by his successors until 1946. Sabah became the North Borneo Protectorate in 1888.

The name "Borneo" is a derivative of the Poni and Berune kingdoms. Its use first appeared in a Portuguese map in the 15th century CE.

2.3 Contemporary History

The movement toward north Borneo independence began in 1961 with the announcement by the Prime Minister of a Malaysian Federation consisting Malay, North Borneo (present-day Sabah), Sarawak, Brunei Darussalam, and Singapore. In 1963, Sabah became part of the Malaysian Federation, which also included Sarawak, Malaya, and Singapore under the 20-Point Agreement. However, the President of the Philippines did not agree to Sabah's independence within the Malaysian Federation since the Sulu Sultanate had been conquered by the Spanish and Americans as part of the Philippine territory. Nor was the Indonesian government under President Sukarno disposed toward the formation of the Malaysian Federation. The Indonesian–Malaysian (or so-called Borneo) confrontation lasted from 1963 to 1966 and was conducted on both sides of the border. Peace negotiations between Indonesia and Malaysia in 1966 led to an agreement in that year with Indonesia formally recognizing the Malaysian Federation.

Currently, Sabah is part of Malaysia's parliamentary democracy with a constitutional monarchy. Governance is centralized in Malaysia's federal system, and the state maintains constitutional safeguards providing a limited degree of self-determination over religion,

[10] R. Cribb. 2000. *Historical Atlas of Indonesia*. Richmond, Surrey: Curzon Press.

language, immigration, citizenship, finance and tariffs, representation in Parliament, land and forest, and local government.

North Kalimantan was formed in 25 October 2012. Before that date, it had consisted of the four most northerly regencies in East Kalimantan. Today it forms a separate province made up of five administrative divisions consisting of Bulungan, Malinau, Nunukan, and Tana Tidung regencies, plus Tarakan city. The province's overlapping cultural and development heritage with Sabah explains the ease with which people from the two territories interact with one another.

3

Objective and Coverage

3.1 Objective

The aim of this study is the mapping of the optimal configuration of North Kalimantan–Sabah cross-border trade and investment in goods and services; and, concurrently, the preliminary (pre-feasibility) design of a border area development plan for the two territories. In the context of the pre-feasibility study, the optimal configuration for the portfolio of North Kalimantan–Sabah trade and investment activities is that which generates the maximum net benefits from the set of feasible projects.

As such, the first objective of the study is to identify existing trade patterns between Sabah and North Kalimantan, and investigate cross-border trade and investment opportunities. The second is to determine the optimal configuration of those projects, based on estimated net returns from the potential trade and investment activities between North Kalimantan and Sabah. The goal is to determine the optimal cross-border trade and investment portfolio for the two territories.

The sub-aim of the study is the application to the region of cross-border production networks, based largely on the spread of integrated global production networks. Production sharing has been largely driven by efforts to exploit either differences in factor endowments or possible scale economies of production activities across areas. In the North Kalimantan–Sabah context, the spatial concentration of industries along the border region combines the traditional growth area model of trade and investment, based on comparative advantage and complementarities, with one based on scale economies from regionalization of production activities. Clustering of industries across the neighboring countries then allows producers to bypass the need to handle the entire production process, and instead concentrate on processing stages. These complementarities permit the exploitation of differences in the factors of production in subregions and generate economies of scale and "cross-hauling" or two-way trade between the neighboring countries, thereby increasing the competitiveness of border industries in regional and global markets.

The application of clustering and cross-hauling to trade between North Kalimantan and Sabah follows ADB's two recently published practical guides for establishing cross-border value chains in BIMP-EAGA.[11] These guides demonstrate how to apply the methodology to identify potential value chains across industries and establish fully integrating networks of activities needed to promote cross-border trade and investment. The present study offers a high-profile case study of best practices for developing a border economic area and successfully establishing value chains in the specific case of North Kalimantan and Sabah.

[11] ADB. 2017. *BIMP-EAGA's Economic Corridors: Business Perceptions about the Investment Climate*. Manila; and ADB. 2017. *BIMP-EAGA Investment Opportunities in Corridor Value Chains*. Manila.

To summarize, the aim of this pre-feasibility study is to explore possible areas of cross-border trade collaboration in goods and services between Sabah and North Kalimantan, and quantitatively determine the net economic benefits of potential investments. The options for moving project proposals forward are elaborated in sufficient detail and contain the needed concrete measures that will permit the overall collaboration program to move through subsequent stages of development into the final implementation and operational phases.

3.2 Tools

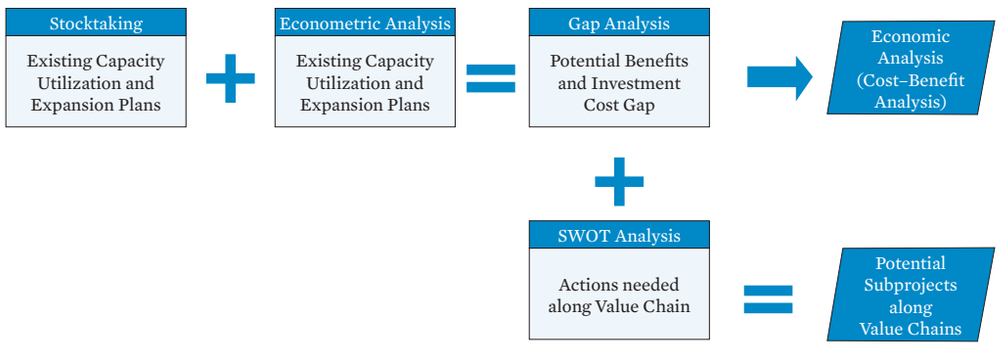
The report analyzes measures needed to develop cross-border projects with the analytical tools shown in Figure 3.1:

(a) *Strengths, weaknesses, opportunities, and threats* (SWOT) *analysis* to evaluate internal and external opportunities and challenges in the focal industries;
(b) *Econometric modeling and forecasting* of the demand for goods and services;
(c) *Gap analysis* to establish actual versus projected differences between actual capacity utilization rates and potential market growth rates in the key industries; and
(d) *Cost–benefit analysis* to determine the economic viability of cross-border trade in goods and services.

For cross-border trade in each industry, we present results from the following perspectives:

(a) *Trade competitiveness analysis* to determine North Kalimantan–Sabah trade

Figure 3.1. Methodology for Medical Tourism and Education and Vocational Training Analysis



SWOT = strengths, weaknesses, opportunities, and threats.
Source: Elaborated by the authors.

opportunities based on revealed comparative advantages, trade concentration, and trade complementarities;
(b) *Price competitiveness* based on real cross exchange rates between Malaysia and Indonesia to determine the effect of macroeconomic policies on industrial

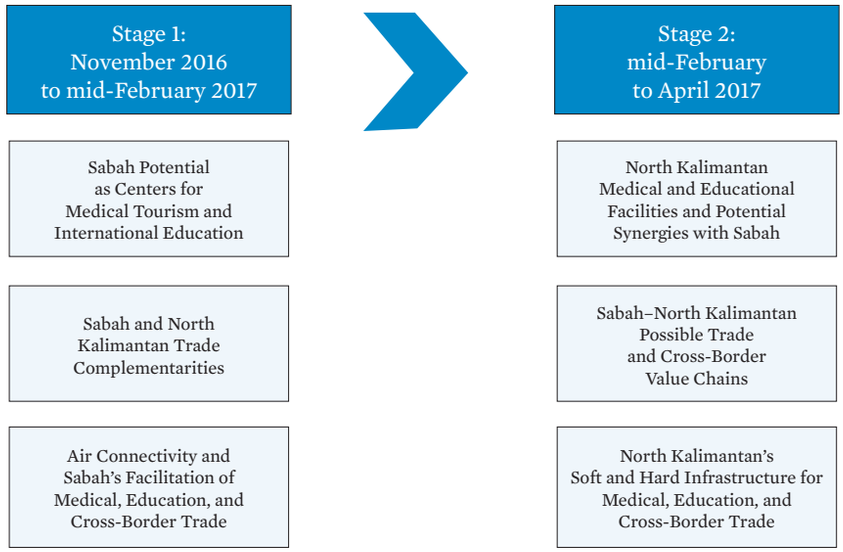
outlook for medical tourism and private higher education by international students; and

(c) *Cross-border value chains* to identify upstream and downstream linkages between Sabah and North Kalimantan.

3.3 Sequence

The study was carried out in two distinct phases (Figure 3.2). The first, which extends from November to mid-February 2017, examined opportunities in trade of goods and services from the point of view of Sabah. The second phase, which took place in mid-February 2017, examined trade opportunities from North Kalimantan's point of view. Together, these two perspectives helped to provide a complete picture of the commercial interests of Sabah and North Kalimantan and, ultimately, to design the integrated components needed to implement a program for cross-border trade and investment.

Figure 3.2. Stages of the Pre-Feasibility Study



Source: Elaborated by the authors.

Fieldwork Findings

Both Sabah and North Kalimantan could benefit from the synergies created by the development of cross-border trade collaboration in tradable goods, as well as medical tourism and international higher education and technical and vocational education and training (TVET).

- *North Kalimantan:* First, the study identifies export products where North Kalimantan has a revealed comparative advantage in the production of specific types of goods. These types of exports can become important drivers for one-way

trade in the province. Second, and more importantly, the study determines areas of complementarity between North Kalimantan's and Sabah's production and export activities that could give rise to cross-border supply or value chains, thereby producing more benefits to the economy than traditional one-way trade. Third, development of higher education and TVET in Sabah supporting those industries where North Kalimantan and Sabah develop cross-border value chains could help develop skilled workers and technology transfers to the province. Technology transfer and skills accumulation would, in turn, help transform North Kalimantan from a resource-based economy to a capital- and technology-intensive one, with more activities focused on downstream activities in cross-border value chains. Finally, Sabah's development of its medical tourism industry will offer North Kalimantan an opportunity to broaden medical coverage in its insurance industry, and provide cost-effective alternatives for high-quality and high-end medical treatment to the North Kalimantan population.

- *Sabah:* First, the pre-feasibility study for medical tourism and international higher-education/TVET supports the government's efforts to diversify the state's economy into high value-added service industries, and attract greater numbers of medical tourists and international students from North Kalimantan and elsewhere. Second, the study explores opportunities to expand commerce with North Kalimantan either through increased exports where Sabah has a comparative advantage, or in areas where complementarities exist between Sabah's and North Kalimantan's exports. Third, the study examines potential cross-border value chains where Sabah and North Kalimantan can develop economies of scale, increase their international competitiveness through joint production activities, and develop special border economic zones.

3.4 Contents

The report consists of the following parts:

- Part I contains an introduction to the study. It provides the economic rationale for the pre-feasibility study, the historical linkages between the two territories, and the study's objective and contents.
- Part II, on pre-feasibility components, describes the project cycle, key stakeholders and their preference ordering for ranking projects, key elements of a pre-feasibility study, and notable features about the present study.
- Part III, on economic profiles, provides a comprehensive look at Sabah and North Kalimantan in terms of their overall socioeconomic characteristics and specific activities of interest in possible areas of economic collaboration. It also surveys existing air, sea, and land routes between Sabah and North Kalimantan.
- Part IV, on government objectives, focuses on national, state, and provincial government strategic objectives in developing each of the territories and how those objectives complement one another. It describes the motivation underlying government interests in developing cross-border trade and investment in goods and services. It also examines private sector interests and concerns about soft and hard infrastructure needed to promote cross-border commercial activities.
- Part V, on trade in goods between North Kalimantan and Sabah, offers detailed information about traded products, and analyzes the information to identify trade patterns and areas of competitiveness and complementarities.

- Part VI, on medical tourism, higher education, and multi-destination tourism, profiles the industries, assesses their potential, identifies possible projects, and offers a preliminary economic analysis for each industry. The economic analysis builds on the governments' strategies for the industries, stages of value addition, and demand forecasts.
- Part VII, on program design, provides a master plan for the integrated approach to developing cross-border trade and investment between North Kalimantan and Sabah through a border economic area program. It also describes each of the key projects that would make up the integrated program.
- Part VIII, on cost–benefit analysis, explores the economic and financial viability of each of the projects on tradable goods and services.
- Part IX, on the nonmonetarized project appraisal, examines ratings by different stakeholder groups of non-efficiency objectives such as environmental sustainability, livelihood enhancement, and pro-poor growth, and it offers a theory-consistent approach to ranking preferences for those objectives by the different stakeholder groups.
- Part X, on the overall program viability, provides an integrated approach to multi-project appraisal and possible economies of scale within the project clusters; it also compares the program's economic net present value under alternative assumptions about cross-border connectivity.
- Part XI, on the program's implementation, describes the various stages to cross-border collaboration and proposes a time line for implementation of the projects. It concludes with a summary of the key findings and recommendations of the study.

The material contained in this report will be of interest to (a) Malaysia's and Indonesia's policy makers; (b) commercial businesses interested in extending their upstream and downstream activities across North Kalimantan's and Sabah's borders to gain scale economies, increase competitiveness, and broaden markets; (c) the medical tourism industry; (d) private education and vocational training institutions; and (e) businesses interested in developing multi-destination tourism services. It will also be useful to practitioners interested in the design, analysis, and application of the newly emerging border economic areas, that offer an integrated and comprehensive approach to developing border regions such as Indonesia's and Malaysia's other border area development programs.

PART II

Pre-Feasibility Components

Summary

Pre-feasibility analysis is an integral part of the project development framework. The six sequential steps consist of identification, preparation, appraisal, execution, operation, and closure and evaluation. This pre-feasibility study follows standard international practices for the steps needed to carry out such an analysis:

- First, it conceptualizes the interrelationship between different cross-border components that are needed to make the program successful in reaching well-defined objectives specified by the governments of Indonesia and Malaysia.
- Second, it determines the key project parameters in terms of location, financial requirements, technical support needed, gains to major beneficiaries, preliminary cost estimates, financial and economic feasibility, and implementation program and time line.

The minimum standard components for each phase of the current pre-feasibility study was developed, as it applies to the border economic area development program, as follows:

- Delimitation of the geographic coverage of the border economic area and characterization of the areas in terms of the social, economic, environmental, cultural, and demographic features of the area.
- Policy and regulatory framework of the two adjacent territories that form the border economic area.
- Quantitative economic analysis of the cross-border trade and investment opportunities from the point of view of comparative advantages, complementarities, competitiveness, and potential cross-border value chains.
- Determination of preference ordering of stakeholders (public and private sector, households, donor community) for border economic area components and subproject rankings.
- For each subproject, conduct strengths, weaknesses, opportunities, and threats (SWOT) analysis, stocktaking, and evaluation of cross-border value chain options.
- For overall program, elaborate overall integrated strategy and action plan for the border economic area, and master plan for designing and implementing the border area.
- Synthesize concept papers from earlier scoping study project phase, if such a scoping study was undertaken; otherwise, develop concept papers and synthesize subproject parameters.
- Conduct cost–benefit analysis for each subproject and for consolidating the program as a whole.
- Carry out nonmonetarized project appraisal of stakeholder preferences and incorporate results into the monetarized project appraisal.
- Evaluate overall program, determine areas of economies scale, and conduct impact analysis of planned infrastructure needed to support projects.
- Outline implementation strategy for the program, and provide preliminary funding sources for capacity development and investments.

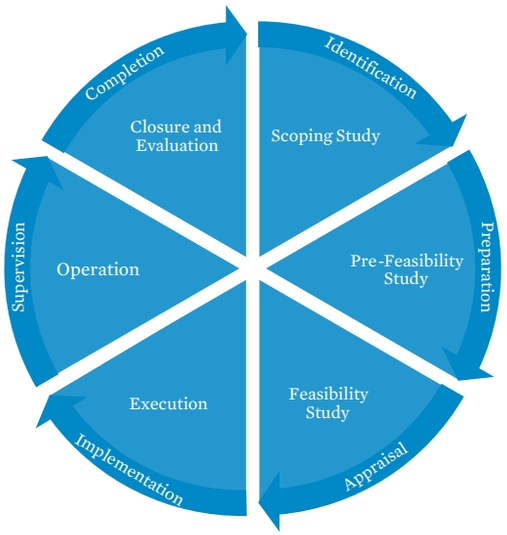
4

Pre-Feasibility Design

4.1 Project Cycle

Pre-feasibility analysis is an integral part of the project development framework. Variants of the project cycle depicted in Figure 4.1 are used by national planning agencies like the Indonesian Ministry of National Development Planning (BAPPENAS) and the Malaysia Economic Planning Unit, as well as international development institutions like ADB and the World Bank.[12]

Figure 4.1. Project Development Framework



Source: Elaborated by the authors.

The six sequential steps consist of identification, preparation, appraisal, execution, operation, and closure and evaluation. Effective implementation of these steps is especially important when designing a program like the present Sabah–North Kalimantan border economic area program that consists of a complex set of integrated subprojects to promote cross-border trade goods and services between the two territories.

(a) Identification

Projects are identified by the government or the private sector where the intervention will take place. Once identified, the conceptual or scoping phase of the project begins. It should define the overall project potential, identify potential subprojects, eliminate options that are unlikely to yield desired benefits, and determine whether there is sufficient opportunity to justify the investment needed to further the overall project.

[12] ADB defines five sequential steps: (a) elaboration of regional cooperation strategy or country partnership strategy, (b) preparation, (c) approval, (d) implementation, and (e) completion and evaluation. The World Bank defines six steps: (a) identification, (b) preparation, (c) appraisal, (d) negotiation, (e) implementation and supervision, and (f) evaluation. Sources: ADB. Project Cycle. https://www.adb.org/site /disclosure/public-communications-policy/cycle; and World Bank. The World Bank project cycle. http://documents.worldbank.org/curated/en/696601478501928227/pdf/109412-BRI-WBG-PUBLIC-date-04-01-1993-The-World-Bank-Project-Cycle.pdf.

(b) Preparation

An analysis is made of the project's technical, financial, economic, environmental, marketing, and management aspects and potential social impact. The social impact inquiry needs to include an examination of all stakeholder preferences for the project scope. That will help to guide the focus of the intervention and ensure that it addresses the needs of the potential beneficiaries and those who may be negatively affected. The pre-feasibility study is carried out at this stage. It aims to select the preferred intervention activities from a shortlisted set defined by the scoping study, and an assessment of whether the potential net benefits warrant a commitment to proceed with the subsequent step involving the full-fledged feasibility study.

(c) Appraisal

An independent assessment is next carried out with a full feasibility study, in addition to determining whether further action justifies moving to the next stage of the project cycle involving project design and construction. The objective is to determine the optimum configuration of the project since, once completed, the next phase involves procurement and construction efforts, at which point there is little or no further opportunity to influence the project outcome.

(d) Execution

After approval, the implementation of the project should follow the detailed plans contained in the feasibility study to ensure that project execution costs are in line with expectations contained in the feasibility study. Reasonable alignment of expected and actual costs requires appropriate time and expenditure investment in the feasibility study and excellence in project execution. What little information is available suggests that there is a record of failure for expectations to align with outcomes.[13] If feasibility studies are to provide realistic and sufficiently detailed information for project outcomes to reasonably align with expectations, sufficient time and funding need to be given to pre-execution phases of the project.

(e) Supervision

Project oversight has three major objectives. First, it ensures that the funds provided to the project are directed toward the agreed-upon activities. Second, it allows the governments or international development institutions to provide technical assistance to help the project achieve its objectives. Third, it provides a mechanism for due diligence covering the project's costs, financing and implementation plans, legal and regulatory requirements, and environmental and social impact.

(f) Closure and Evaluation

The evaluation compares project costs, benefits, timetable, and efficiency with what had been expected at the time of appraisal, and feeds into the next cycle of projects with

[13] While published comparisons of expectations versus actual performances are nearly nonexistent, the World Bank in 1978 listed 109 operations in which a quarter had cost overruns of 25% or more, one-tenth had cost overruns of 50% or more, approximately half had time overruns of 25% or more, and approximately one-third had time and cost overruns of 50% or more.

suggestions for project performance improvements. The entire process covers inputs, outputs, outcomes, and impacts.

4.2 Pre-Feasibility Phase

The objective of the pre-feasibility study for the Sabah–North Kalimantan trade and investment development initiative is to determine whether its subprojects have a solid market, sound financial base, and support the objectives of stakeholders that include the public and private sectors, the donor community, and households. In the context of government and ADB support to the program, it also determines possible capacity building through technical assistance needed to promote and develop the program and overcome obstacles to cross-border trade and investment.

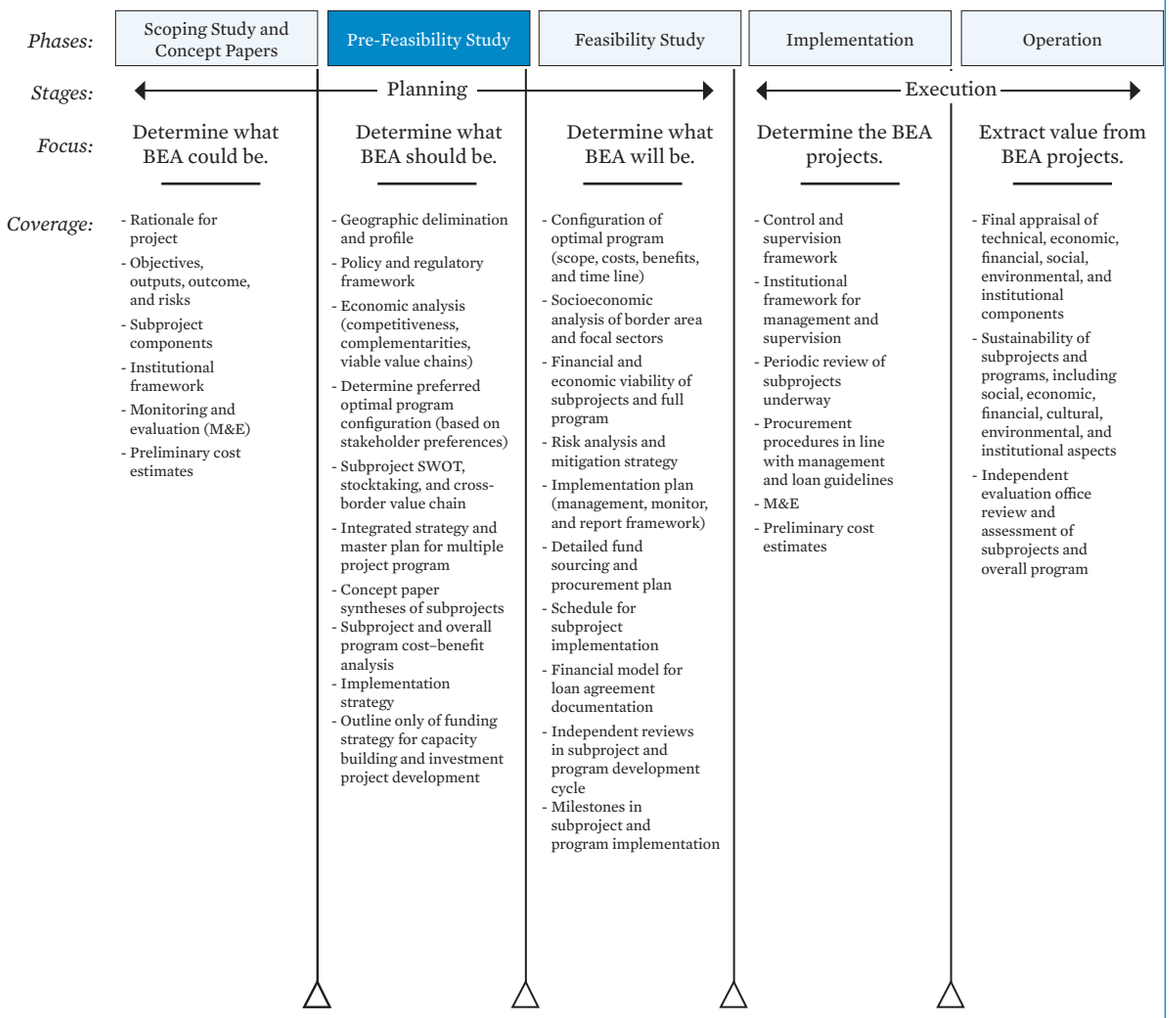
This pre-feasibility study follows standard international practices for the steps needed to carry out such an analysis: First, it conceptualizes the interrelationship between different cross-border components that are needed to make the program successful in reaching well-defined objectives specified by the governments of Indonesia and Malaysia. Second, it determines the key project parameters in terms of location, financial requirements, technical support needed, gains to major beneficiaries, preliminary cost estimates, financial and economic feasibility, and implementation program and time line. It therefore focuses on methods to optimize each program component in conjunction with an in-depth analysis of project parameters that make the overall integrated program successful.

To the extent that the study accomplishes these objectives and that the program proves to be viable, the full feasibility study should then carry out minor adjustments to all the details of the present study to optimize the returns of investments made to the program, and guide its design and implementation, including its construction phase, where appropriate, and final operation.

Figure 4.2 shows the minimum standard components for each phase of the project cycle, as it applies to the border economic area development project. For the pre-feasibility phase, it contains the following tasks:

- Delimitation of the geographic coverage of the border economic area and characterization of the areas in terms of the social, economic, environmental, cultural, and demographic features of the area.
- Policy and regulatory framework of the two adjacent territories that form the border economic area.
- Quantitative economic analysis of the cross-border trade and investment opportunities from the point of view of comparative advantages, complementarities, competitiveness, and potential cross-border value chains.
- Determination of preference ordering of stakeholders (public and private sector, households, donor community) for border economic area components and subproject rankings.
- For each subproject, conduct strengths, weaknesses, opportunities, and threats (SWOT) analysis, stocktaking, and evaluation of cross-border value chain options.
- For overall program, elaborate overall integrated strategy and action plan for the border economic area, and master plan for designing and implementing the border area.

Figure 4.2. Phases of Border Economic Area Development Project



BEA = border economic area; SWOT = strengths, weaknesses, opportunities, and threats.
Source: Elaborated by the authors based on W. Mackenzi and N. Cusworth. 2017. The Use and Abuse of Feasibility Studies: 2016 Update. Proceedings of the Australasian Institute of Mining and Metallurgy conference. Adelaide.

- Synthesize concept papers from earlier scoping study project phase, if such a scoping study was undertaken; otherwise, develop concept papers and synthesize subproject parameters.
- Conduct cost–benefit analysis for each subproject and for consolidating the program as a whole.
- Carry out nonmonetarized project appraisal of stakeholder preferences and incorporate results into the monetarized project appraisal.
- Evaluate overall program, determine areas of economies scale, and conduct impact analysis of planned infrastructure needed to support projects.
- Outline implementation strategy for the program, and provide preliminary funding sources for capacity development and investments.

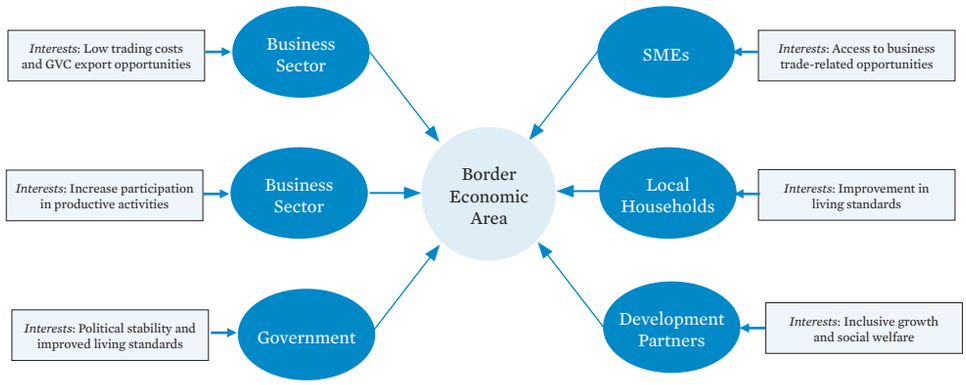
5

Stakeholder Preferences

5.1 Prioritizing Nonmonetarized Preferences

Comparison of projects for possible prioritization within the program requires the consolidation of ratings for the border economic area components. Moreover, the method used to compare projects should be carried out in a way that reflects the nonmonetarized preferences of stakeholders. Those interests could, for instance, favor the socioeconomic development of households in the region, that is, the improvement of the local community's welfare; alternatively, they could support commercial interests of large companies able to leverage cross-border value chains; or they could back the expansion of small businesses in their involvement with transnational operations through linkages to large enterprises operating in cross-border value chains (Figure 5.1).

Figure 5.1. Possible Cross-Border Economic Cooperation Interest Groups

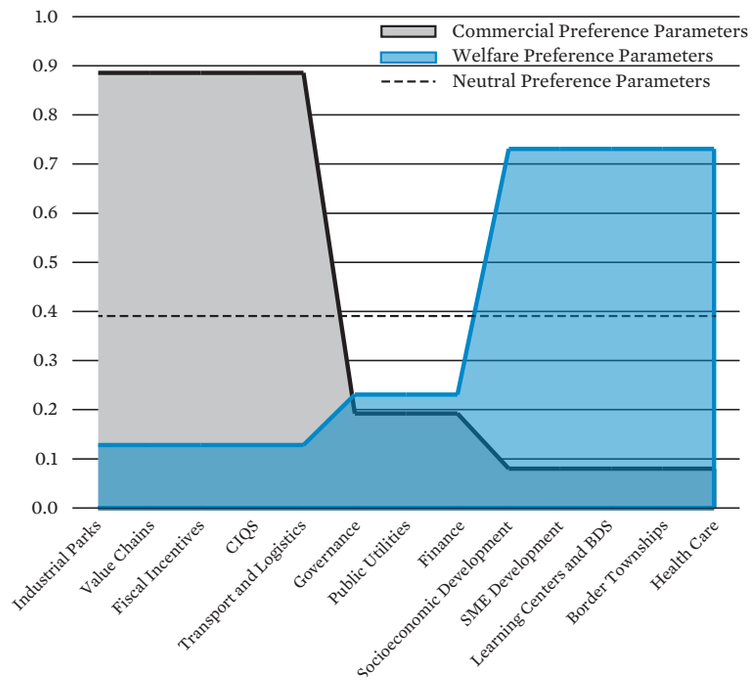


GVC = global value chain, SMEs = small and medium-sized enterprises.
Source: Elaborated by the authors.

It is inappropriate to simply average the ratings of border economic area features since simple averages are unlikely to consider stakeholder preference differences. A weighted sum would be better, but there are many ways to weight a series and the method selected needs to be justified. Fortunately, economics provides a way to reflect stakeholder preferences that is both theoretically and empirically sound.[14]

[14] For a technical explanation of the methodology, see M. Lord and P. Tangtrongjita. 2016. *Border Economic Zones in Thailand: A Practitioner's Guide*. Bangkok: Chulalongkorn University Press.

Figure 5.2. Distribution of Preference Ordering among Commercial and Welfare-Improving Interests



BDS = business development services; CIQS = customs, immigration, quarantine, and security; SMEs = small and medium-sized enterprises.
Source: Elaborated by the authors.

For commercially oriented groups, border economic components include (a) industrial estates; (b) value chains; (c) fiscal incentives; (d) customs, immigration, quarantine, and security; and (e) transport and logistics. Border components that benefit both commercial and welfare-improving interests are (i) governance, (ii) public utilities, and (iii) finance. Finally, welfare improving components include (a) socioeconomic development, (b) development of small and medium-sized enterprises, (c) learning centers and business development services, (d) border townships, and (e) health care. Possible preference orderings for the three groups are shown in Figure 5.2.

5.2 Notable Features

It is common for the pre-feasibility term to be applied to a range of activities and situations, without a clear delimitation of the tasks involved. Noteworthy among these issues are the following:[15]

[15] W. Mackenzi and N. Cusworth. 2017. The Use and Abuse of Feasibility Studies: 2016 Update. Proceedings of the Australasian Institute of Mining and Metallurgy conference. Adelaide. http://www.projectevaluation2016.ausimm.com.au/Media/projectevaluation2016/presentations/1430pm_NCusworth.pdf.

- The pre-feasibility process is not well known, even though this phase of the project cycle is the most value-adding phase of project development.
- The costs and time to produce a quality pre-feasibility study are consistently underestimated.
- Integrated project implementation plans are often not completed across subprojects.

In the present pre-feasibility study, it was ensured that all components are well elaborated and that all subprojects are integrated within a master plan:

(a) First, the pre-feasibility study contains all standard components, namely, (i) macroeconomic and sector analyses; (ii) public sector plans and priorities; (iii) stakeholder group preferences and their effect on the design of the program; (iv) overall integrated program strategy and action plan; (v) subproject identification, conceptualization, and design; (vi) subproject cost–benefit analysis; and (vii) outline of program and subproject execution activities and sequencing.[16]

(b) Second, development of the major parts of the pre-feasibility study generates concreate, actionable projects within a master plan for an integrated economic area program. The master plan contains a strategy and action plan (Part VII), key projects and feasibility analysis (Parts VIII and IX), program appraisal (Part X), and implementation steps (Part XI).

(c) Third, in the project analysis, attention is focused on demand analysis since this component is often the weakest link in a full feasibility analysis. There are two reasons for the weakness. First, project analyses are often undertaken with the expertise of engineers, who tend to focus on the costs associated with the project within an industry. Second, there is often misidentification of benefits due to double counting of benefits since, like GDP measurement, project benefits can be measured from three angles: (a) expenditure approach, based on spending on all final goods and services; (b) income approach, based on incomes to the factors of production; and (c) output approach, based on summing the value of sales of goods and services, adjusted for intermediate goods purchased.

[16] ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila. http://dx.doi.org/10.22617/TIM178607-2.

PART III

Economic Profiles

Summary

Sabah and North Kalimantan have a geographic size that is approximately equal to one another. But North Kalimantan's population density is only 9 persons per square kilometer (km^2), one of the lowest among Indonesia's provinces, whereas that of Sabah is 52 persons/km^2.

The two geographic areas have a long history of trade and cultural ties, which explains the ease with which people from the two territories interact with one another. In the early 6th century CE, the Kingdom of Poni extended from present-day southwest Sabah, Brunei Darussalam, and northwest Kalimantan and lasted for several centuries. In the 14th century, the Sultanate of Brunei ruled the northern part of Borneo as well as the southern Philippines. In the late 19th century, northern Borneo became a British protectorate until independence was declared in the 1960s, while the Dutch sphere of influence dominated southern and eastern Borneo.

Sabah is the fourth largest contributing state to the overall economy of Malaysia, following Selangor, Sarawak, and Johor.

- *Services:* Services contribute 40% to the state's gross domestic product (GDP), and the remaining contributions are based on the primary sectors of agriculture, forestry, and petroleum. Tourism-related industries contribute 10% to GDP, with ecotourism an increasingly important activity for the state.
- *Product Industries:* The petroleum industry is mainly located in the west coast of the state. Palm oil and fisheries are the largest economic activities in the area bordering North Kalimantan. In fisheries, the aquaculture and marine fish cage sector are growing in importance, and the seaweed industry has experienced a strong, albeit unstable, growth in recent years.

North Kalimantan was formed in 25 October 2012. Prior to that date, it had consisted of the four most northerly regencies in East Kalimantan. As the youngest Indonesian province, North Kalimantan's industries are at an early stage of development. As such, its economic takeoff is being led by a relatively few industries:

- *Product Industries:* Production is concentrated on abundant resources in minerals (coal, gold, oil and gas, limestone, and quartz), forestry (9.3 million acres), agriculture (oil palm, rubber, coconut, rice, cocoa, pepper, and coffee), and fisheries (capture fisheries and fish farming).
- *Exports:* Exports are concentrated on a few unprocessed products, specifically crude palm kernel, bituminous coal, fish and crustaceans, crude palm oil, sawn wood, wood panels, plywood, and fresh and frozen fish and crustaceans.

6

North Kalimantan's Takeoff Stage of Development

6.1 Overview

North Kalimantan has an area of 72,567 square kilometers (km²), equal to that of Sabah, but it has a much smaller population size of 738,163 (2013). Thus, its population density is only 9 persons/km², which is one of the lowest among Indonesia's provinces (Table 6.1).[17]

The main ethnic groups are Suku Bulungan, Dayak, and Tidung, all of which originate from the northeastern part of Borneo and surrounding small islands. There is, however, a large influx of people from other parts of Indonesia, as the province's population is one of the fastest growing in the country. There is consequently a rising multiethnic society.

The province was formed in October 2012 from the northern area of East Kalimantan. It has five administrative divisions: Tarakan City and the four regencies of Bulungan, Malinau, Nunukan, and Tana Tidung (Figure 6.1). Its capital is Tanjung Selor in Bulungan Regency. The following characterizes the land size and populations in the administrative divisions:

Figure 6.1. North Kalimantan Administrative Regencies

Source: Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

- *Bulungan Regency* – Bulungan Regency is important because one-fourth of the population lives there and its land size is 18% of the total for the province.
- *Malinau Regency* – Malinau Regency has the largest land area, accounting for 55% of the total for North Kalimantan, but its population size accounts for only 11% of the provincial total.
- *Nunukan Regency* –The regency of Nunukan borders Sabah. Its area of 14,247.50 km² represents 20% of the province's total land area, while its population accounts for 26% of the total.
- *Tana-Tidung Regency* – Tana-Tidung is the least populated regency, where only 3% of North Kalimantan people live. Its land area represents 7% of the total for the province.
- *Tarakan City* – Tarakan city has the smallest land area (0.3% of the total), but over one-third of the province's population live on the island.

[17] The material in this section draws from the information contained in Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

Table 6.1. North Kalimantan Profile

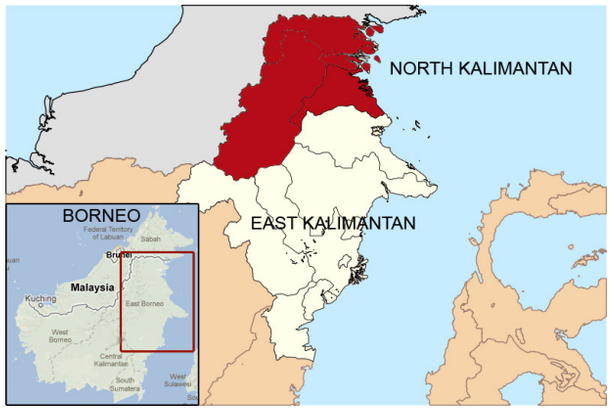
A. Geography			
	Land Surface (square kilometer [km²])	72,567	
	Capital City	Tanjung Selor	
	Administrative Divisions	Tarakan city and regencies of Bulungan, Malinau, Nunukan, and Tana Tidung	
B. Population			
	Population	**738,163 (2013)**	
	% Annual Population Growth	2.32 (2015)	
	Population Density (persons/km²)	9 (2015	
	Number of Households (2015)	145,000	
	Ratio of Male to Female (2015)	1.13	
	Ethnic Groups	Tidung, Bulungan, Banjar, Dayak, Lun Bawang, Murut, Kenyah, Bugis, Bajau	
	Major Languages Spoken	Indonesian, Kutai Malay, Banjar, Dayak, and Buginese	
	Poverty Gap (2016), of which:	0.88	
	– Urban	1.06	
	– Rural	0.74	
C. Economy			
	Gross State or Provincial Product ($ million)	5,020 (2016)	
	Per Capita GDP ($)	$7,299 (2015)	
	Gini Coefficient	0.30 (2016)	
	% GDP Growth	3.13 (2015)	
	Labor Force	268,758 (2013)	
	Total Employment	5.23 (2016)	
		North Kalimantan	**Indonesia**
	Average of Net Income of Self Employed by age group, $/month (2016)	**139.7**	**106.0**
	– 15–24 years	55.3	77.8
	– 25–54 years	149.6	115.3
	– 55+	114.6	82.9
	Average of Net Wage or Salary, $/month (2016)	**207.8**	**163.9**
	– Managerial workers	398.1	385.3
	– Technical workers	283.5	214.0
	– Clerical workers	199.0	202.2
	– Sales workers	117.5	140.2
	– Production laborers	202.2	139.0
	– Services workers	108.2	120.5
	– Agriculture, forestry, and fisheries workers	191.1	99.2

GDP = gross domestic product.
Sources: Department of Statistics North Kalimantan; Badan Pusat Statistik (BPS-Statistics Indonesia).

6.2 Economy

The size of North Kalimantan's economy is relatively small compared with other provinces in Indonesia. Its gross provincial domestic product (GDP) of $5,020 million in 2016 ranks 27th out of the 34 provinces in the country (Figure 6.2). However, per capita income of its people is among the highest in the country. At $7,299/person, North Kalimantan ranks fifth out of the 34 provinces.

Figure 6.2. Map of North Kalimantan



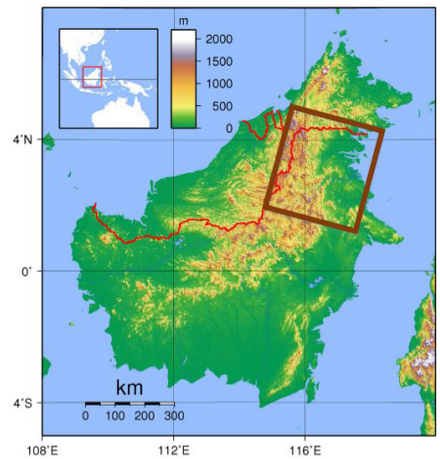
Source: Bio-Fuels Watch.

Income inequality is among the lowest in Indonesia. It has the third lowest Gini coefficient of inequality among the 34 provinces. Poverty is relatively low compared with other provinces. In rural areas, North Kalimantan is in the lower one-third of provinces with the smaller poverty gap index; and, in urban areas, the province ranks sixth among provinces having the lowest poverty gap index.

Employment conditions are also favorable. The 2016 unemployment rate was 5.2%, compared with 5.6% nationally. Average salaries and wages are 1.3 times higher than for Indonesia as a whole, and laborers in agriculture, forestry, and fisheries have wage rates that are 1.5 to 1.9 times higher than the national average.

North Kalimantan has a relatively large public sector, with 17% of employed people working directly for the government compared with 9% nationally. Most post-secondary school graduates work for the government, while individuals with lower education are generally employed in agriculture, fisheries, and forestry, as well as low-end service activities. Employment in manufacturing and construction activities (18%) is lower than the national average (21%).

Figure 6.3. North Kalimantan Typography



Source: Wikipedia. Borneo. https://en.wikipedia.org/wiki/Borneo (accessed 6 March 2017).

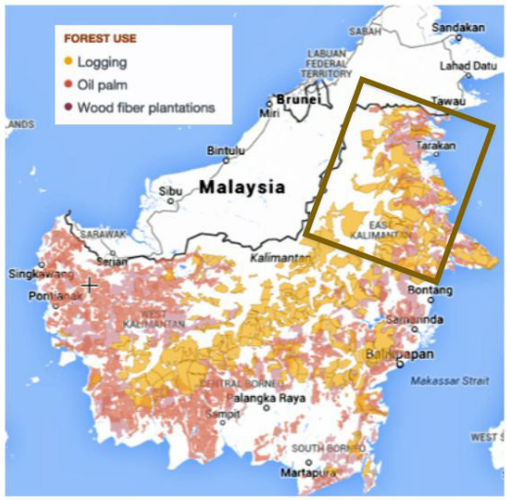
The province's typography is dominated by the Borneo mountain rainforests of above the 1,000-meter elevation to the west, and lowland rain forests to the east (Figure 6.3). The mountainous area consists of tropical mountain cloud forest and laurel forest of high humidity and relatively stable, mild temperatures. It contains North Kalimantan's densely forested Kayan Mentarang National Park, which is located in the border with Sarawak.[18] The lowland rain forest

[18] Currently there are about 20,000–25,000 Dayak people living around the park, from various tribes including the Kenyah, Punan, Lun Daye, and Lun Bawang. Animals found in the park include mammals such as the Malayan pangolin, the long-tailed macaque, the proboscis monkey, the Bornean gibbon, the greater slow loris, the western tarsier, the clouded leopard, the marbled cat, the flat-headed cat, the Oriental small-clawed otter, the sun bear, and the Hose's palm civet. Other protected species include the rhinoceros hornbill, the helmeted hornbill, Bulwer's pheasant, and the wrinkled hornbill.

supports approximately 10,000 plant species, 380 bird species, and several mammal species, though much of the forest is being reduced by logging and conversion to commercial land uses such as rubber, oil palm, and industrial timber plantations. The Sunda Shelf mangroves ecoregion is located on the coastal areas and is home to the proboscis monkey. Loss of habitat persists due to their trees being cut for timber and firewood and to clear land for agriculture and urban development such as shrimp farming.

The province's major industries are as follows (Figure 6.4):[19]

Figure 6.4. North Kalimantan Land Use



Source: Bio-Fuels Watch.

- *Minerals* – Coal, gold, oil, and gas (throughout the province); limestone (in Malinau and Nunukan); sandstone (Nunukan); and quartz (Nunukan).
- *Forestry* – There are over 1.0 million hectares of forest in the province, concentrated in Malinau, Bulungan, and Nunukan. Wood products include roundwood, sawn wood, veneer, and plywood.
- *Agriculture* – Paddy rice, maize, soybeans, coconuts, coffee, cocoa, pepper, and rubber.
- *Fisheries* – Crustaceans and seaweed from Tarakan, Bulungan, and Nunukan; thin fish and milkfish from Tarakan and Sebatik in Nunukan Regency; skipjack tuna, Ambalat anchovy, and dried shrimp from Sebatik.
- *Tourism* – Major attractions include ecotourism (e.g., waterfalls of Long Pin and Idaman in Tanjung Selor, and Binusan in Nunukan; hot springs in Sajau, Bulungan; Idaman waterfalls; and several world-famo.us beaches in Bulungan and Nunukan regencies); cultural sites of the Bulungan Sultanate, as well as the biannual celebrations of the birth of the Bulungan Regency; historical sites of the Dutch and Japanese occupations; cultural festivities in Tarakan; Setulang village and its protected ancestral forest in Malinau Regency; the Kalimantan elephant and black orchid and carrion flowers in Nunukan Regency; and Rian mountain and its waterfall, along with the protected forest surrounding the Sesayap river in Tana Tidung Regency.

6.3 Governance

The provincial government of North Kalimantan is authorized to enact regulations that carry the force of law, as long as they do not conflict with the central government's laws or regulations. Decentralization of power from the central government was granted under laws enacted in the early part of the 2000s.[20] It applies to the following subdivisions of government: provincial (level 1), regencies and cities (level 2), districts (level 3), and villages (level 4).

[19] Government of North Kalimantan. 2015. North Kalimantan: Trade, Tourism and Investment. Profile and Investment Opportunity of North Kalimantan Province.

[20] Law Number 22 (1999) on Local Government, revised by Law Number 32 (2004).

Under the deconcentrated government structure, North Kalimantan's provincial government has the authority to pass provincial regulation, while the second-tier subdivisions, made up of the five regencies and cities within the province, pass regency and city regulations.[21] These provincial, regency, and city regulations are passed by the North Kalimantan parliamentary body, along with their chief executives, that is, the governor, regent, or mayor, depending on the hierarchical level of the regulation. Deconstruction has tended to strengthen local administrative financial and management aptitudes, though capacity building remains an ongoing process. Nevertheless, problems remain. For example, Indonesia's standardization and certification requirements for products imported into North Kalimantan greatly impact cross-border trade since the province's importers must obtain local certification of food and beverage product imports from Malaysia from local government authorities, regardless of the extent to which the products are processed. This restriction especially affects halal product imports from Sabah at the border. Regulatory guidelines remain unclear and businesses are anxiously awaiting government clarification to facilitate trade between Tarakan and Tawau.

The head of the North Kalimantan provincial government is the governor and the legislative body, or "Regional People's Representatives Assembly," all of whom are elected by popular vote for a 5-year term. Each of the administrative divisions within the province, that is, the four regencies and city of Tarakan, enjoy greater decentralization of affairs than the provincial body in such areas as public schools and public health facilities.[22] At the next level, the subdistrict is headed by the *camat*, who is responsible to the head of their regency.

[21] A. Nasution. 2016. Government Decentralization Program in Indonesia. *ADBI Working Paper Series*. No. 601. Tokyo: Asian Development Bank Institute. https://ssrn.com/abstract=2877579.

[22] For details, see Wikipedia. Subdivisions in Indonesia. Online: https://en.wikipedia.org/wiki/Subdivisions_of_Indonesia.

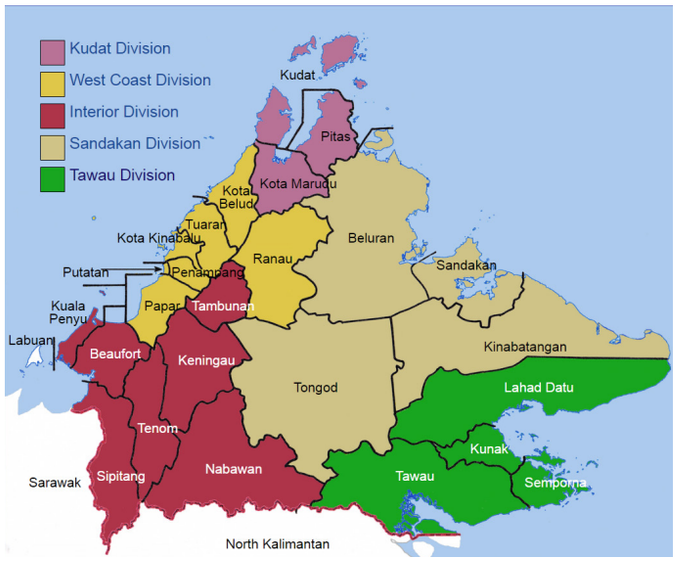
7

Sabah's Drive to Maturity

7.1 Overview

Sabah is the second largest state in Malaysia after Sarawak. Its land surface of 73,902 square kilometers (km²) is slightly smaller than North Kalimantan. Yet its population is 5.5 times greater than that of North Kalimantan. The state's administrative divisions are Interior, Kudat, Sandakan, Tawau, and West Coast, which are subdivided into 23 districts (Figure 7.1).[23] Sabah has a notable diversity in ethnicity, culture, and language (Table 7.1). Malay is the official language of the state, while Islam is the official religion. Nevertheless, other religions are practiced.

Figure 7.1. Sabah Administrative Divisions and Districts



Source: Wikipedia. Sabah. https://en.wikipedia.org/wiki/Sabah.

Of its five administrative divisions, the ones that border North Kalimantan are Tawau Division on the southeast and Interior Division on the southwest. It has an area of 14,905 km² and a population of nearly 900,000, while the Interior Division has a larger area of 19,298 km², covering 25% of Sabah, but a much smaller population of about 425,000, or 15% of the state's population. Nevertheless, as the government upgrades infrastructure in and around its largest town of Keningau, the population size is expected to grow rapidly and Keningau itself will become one of the state's third largest cities.

Tawau Division is the most important for North Kalimantan because cross-border movements of goods and people occur mainly through this administrative division. It has many immigrants from North Kalimantan, as well as Filipinos from Mindanao island and ethnic Chinese. Tawau port is the third largest port in Sabah, after Kota Kinabalu and Sandakan, and it serves as a major timber and agricultural export gateway in the state.

[23] Unless otherwise noted, much of the information in this section draws on the material in Wikipedia. Sabah. https://en.wikipedia.org/wiki/Sabah.

Table 7.1. Sabah Profile

A. Geography	
Land Surface (square kilometer [km²])	73,902
Capital City	Kota Kinabalu
Administrative Divisions (5)	Interior, Kudat, Sandakan, Tawau, and West Coast
B. Population	
Population (million)	3.81 (2016)
% Annual Population Growth	2.5% (2016)
Population Density (persons/km²)	52
Male Life Expectancy at Birth (years)	72.4 (2016)
Female Life Expectancy at Birth (years)	75.8 (2016)
Ethnic Groups	Chinese (20%), Kadazan-Dusun (about 25%), Bajau (15%) and Murut (3%), and 28 other official ethnic groups
Major Languages Spoken	Malay, English, Mandarin, Cantonese, Kadazan-Dusun, Bajau, Murut, Hakka, Dusunic, and Paitanic
Household income, monthly United States dollars (2014):	$1,102
Incidence of Poverty (2014), of which:	4%
– Urban	2%
– Rural	7%
Total Migration (2014), of which:	93,700
– Intrastate migration	70.0%
– Interstate migration	14.6%
– International migrants	15.3%
C. Economy	
Gross State Product at constant 2010 prices ($ million)	$15,904 (2015)
Per Capita GDP at current prices ($)	$4,457 (2015)
Gini Coefficient	0.39 (2014)
% GDP Growth	6.1% (2015)
Labor Force	1,927 (2016)
Total Employment (thousands)	1,824 (2016)
Unemployment rate (%)	5.3% (2016)
Labor Force Participation Rate, of which	70.8% (2016)
– Male	85.4% (2016)
– Female	54.7% (2016)
GDP by Sector of Origin (2014):	100.0%
– Services	40.8%
– Agriculture	25.4%
– Mining and quarrying	21.8%
– Manufacturing	8.6%
– Construction	3.1%
– Import duties	0.3%

GDP = gross domestic product.
Source: Department of Statistics Malaysia.

Under the Pan-Borneo Highway project, new routes will connect Sabah with the Trans Kalimantan Highway in Indonesia, along with Sabah and Brunei Darussalam. Of its two packages, the West Coast area will be completed in 2021; and the second, covering the East Coast area and extending into North Kalimantan, is expected to be completed in 2022.

7.2 Economy

Sabah is the fourth largest contributing state to the overall economy of Malaysia, following Selangor, Sarawak, and Johor.[24] Services contribute 40% to the state's GDP, and the remaining contributions are based on the primary sectors of agriculture, forestry, and petroleum. In services, tourism-related industries contribute 10% to GDP, with ecotourism an increasingly important activity for the state. The petroleum industry is mainly located in the west coast of the state. Palm oil and fisheries are the largest economic activities in the area bordering North Kalimantan. In fisheries, the aquaculture and marine fish cage sector are growing in importance, and the seaweed industry has experienced a strong, albeit unstable, growth in recent years.

Sabah has abundant natural resources, and its economy is strongly export-oriented. The primary exports include oil, gas, timber, and palm oil. As part of BIMP-EAGA, Sabah also continued to position itself as a main gateway for regional investments. Electricity interconnection between Sabah, the Indonesian province of North Kalimantan, and the Philippine province of Palawan are also in the process as part of BIMP-EAGA. Following the United States government's abandonment in the Trans-Pacific Partnership economic agreements in early 2017, Sabah has since begun to direct its trade to Chinese and Indian markets.

There are 2.2 million hectares of land suitable for cultivation. Oil palm is grown in nearly 90% of the total cultivated land area. Other significant crops are rubber, cocoa, and coconuts. Palm oil is mainly cultivated in the eastern part of the state around Tawau, Kinabatangan, Sandakan, and Lahad Datu. Palm oil refineries mainly produce refined, bleached, and deodorized (RBD) palm oil, as well as olein and stearin, while palm kernel crushers produce crude palm kernel oil. The main palm oil products exported are crude palm oil, palm kernel oil, and processed palm oil in the form of RBD palm oil, stearin, olein, and fatty acids. Sabah is the main cocoa-producing state in Malaysia, though overall production has fallen because palm oil has increasingly replaced its area planted. Only 2%–3% of the state's cocoa bean production is processed.

Sabah's average per capita GDP ranks 13th out of the 15 states and federal territories in Malaysia. In 2015, Sabah's GDP per capita was $4,457 a year, which represents 53% of the national average and 45% of Sarawak's per capita GDP.[25] Its income inequality is relatively high compared with other parts of Malaysia. The unemployment rate is around 5%, and poverty is significant because of the large numbers of refugees from southern Philippines.

[24] If federal territories are included, then Sabah is the fifth largest contributors since the federal territory of Kuala Lumpur is the second largest contributing administrative division of Malaysia.

[25] Department of Statistics, Malaysia. 2016. Akau Negara: KDNK Negari/GDP by State: National Accounts. September.

7.3 Governance

Malaysia's state-level governance is divided between the federal government and the state governments, while the federal territories are directly administered by the federal government. The head of state is the governor, also known as the Yang di-Pertua Negeri, while the head of government is the chief minister.

Sabah, like Sarawak, has a higher degree of autonomy as part of the bargain which was included in the 20-point agreement and 18-point agreements, under the form part of the Proclamation of Malaysia for the creation of the federation in 1963. The agreements state the conditions and rights that were meant to safeguard the autonomy and the special interest of the people of Sabah as well as Sarawak, protecting their rights on religion, language, education, administration, economy, and culture. They include administration, immigration, and judiciary powers, such as having separate immigration policies and regulations, and a unique residency status for citizens.

8

Connectivity

Figure 8.1. Air Connectivity between Kota Kinabalu, Tawau, and Tarakan on MASwings

Source: MASwings.

Table 8.1. Air Connectivity between Tawau, Sabah (TWU), and Tarakan, North Kalimantan (TRK)

Airline	Time	Time	Days
MASwings	10:30	11:35	Mon, Thu, Sat

Source: MASwings.

Table 8.2. Air Connectivity between Tarakan (TRK) and Tanjung Selor (TJS)

Airline	Time	Time	Days
Kalstar	09:05	14:20	Tue, Thu, Sat

Source: Skyscanner.com.

8.1 Air Linkages

The governments of Malaysia and Indonesia have both supported expanded air connectivity between North Kalimantan and Sabah. Nevertheless, rather than establishing predetermined air routes, the governments are improving airport infrastructure facilities and promoting tourism to encourage airlines to plan their routes based on traffic demand.

There is a memorandum of understanding among the BIMP-EAGA member countries of Brunei Darussalam, Indonesia, Malaysia, and the Philippines to encourage the expansion of intraregional air linkages. A protocol to amend the memorandum of understanding signed in conjunction with the 22nd ASEAN Transport Ministers' Meeting in Manila, Philippines, in November 2016, which provides greater flexibility on existing routes and encourages the opening of new routes.[26]

Currently air connectivity between Sabah and North Kalimantan only exists between the islands of Tawau and Tarakan. MASwings flies three times each week between Tawau and Tarakan (Figure 8.1 and Table 8.1). For the year 2015, total passenger movement for that route was 20,894. Generally, business persons, tourists, and shoppers from North Kalimantan use this form of transportation.

Within North Kalimantan, there are three weekly flights between Tarakan island and Tanjung Selor, the capital of the province (Table 8.2). However, these flights are unreliable since there are often cancellations due to technical difficulties. There are also local flights, usually unscheduled, from relatively small airstrips in the other regencies.

[26] Government of Sabah. 2016. Protocol to Amend the Memorandum of Understanding between the Governments of Brunei Darussalam, Indonesia, Malaysia, and the Philippines on Expansion of Air Linkages. Kuching, Sarawak, Malaysia. 26 October.

In Sabah, the major airport is Kota Kinabalu International Airport (KKIA). It is Malaysia's second largest airport hub after Kuala Lumpur, with an annual capacity of 12 million passengers. There are currently 20 airlines servicing the airport and, in 2015, there were over 71,000 flights handling 6.6 million passengers and nearly 25,000 tons of cargo. Two airlines offer direct flights from KKIA to Tawau, which has flights to Tarakan in North Kalimantan. Malaysia Airlines has 6 flights daily, while AirAsia has 3 flights daily (Table 8.3).

In North Kalimantan, Tarakan's Juwata International Airport has a 2,250-meter runway. Elsewhere in North Kalimantan, there are local airports with shorter runways. They include the Tanjung Harapan airport in Bulungan Regency, which has a 1,200-meter runway; Nunukan airport, with a 900-meter runway; and Robert Atty Bessing airport in Malinau Regency, with a 1,400-meter runway.

Table 8.3. Air Connectivity between Kota Kinabalu (BKI) and Tawau (TWU)

	BKI=>TWU	TWU=>BKI	Frequency
Airline	Time	Time	Days
MAS	7:40	9:00	Daily
MAS	8:20	10:20	Daily
MAS	8:50	10:30	Daily
AirAsia	8:50	10:10	Daily
MAS	13:10	15:10	Daily
MAS	15:00	16:05	Daily
AirAsia	16:05	15:25	Daily
MAS	20:20	21:40	Daily
AirAsia	20:30	21:50	Daily

MAS = Malaysian Airlines.
Source: Skyscanner.com

8.2 Sea Links

North Kalimantan's main seaports are Tarakan's Malundung, Tengkayu I, and Tengkayu II seaports, along with Tunon Taka seaport in Nunukan.

Sea links exist between Tawau and the three North Kalimantan ports of Tarakan city in Tarakan island, Nunukan city in Nunukan island, and Sungai Nyamuk city on the Indonesian side of Sebatik island (Figure 8.2). There are nine daily ferry services between Tawau and Nunukan, which will take approximately 1 hour, and two ferry services between Tawau and Tarakan, which will take about 3 hours. Services change often and it is best to check with the Sabah Port Authority for the latest updates.[27]

8.3 Overland Links

Land crossings along the roughly 330-kilometer border are unpaved and primarily used by local populations, so air and sea links currently dominate connectivity. The situation is changing, however. The road connecting Kalabakan in Sabah to Simanggaris in North Kalimantan is being upgraded to facilitate trade, promote border development, and better control the flow of goods and people through customs, immigration, and quarantine facilities (Figure 8.3).[28]

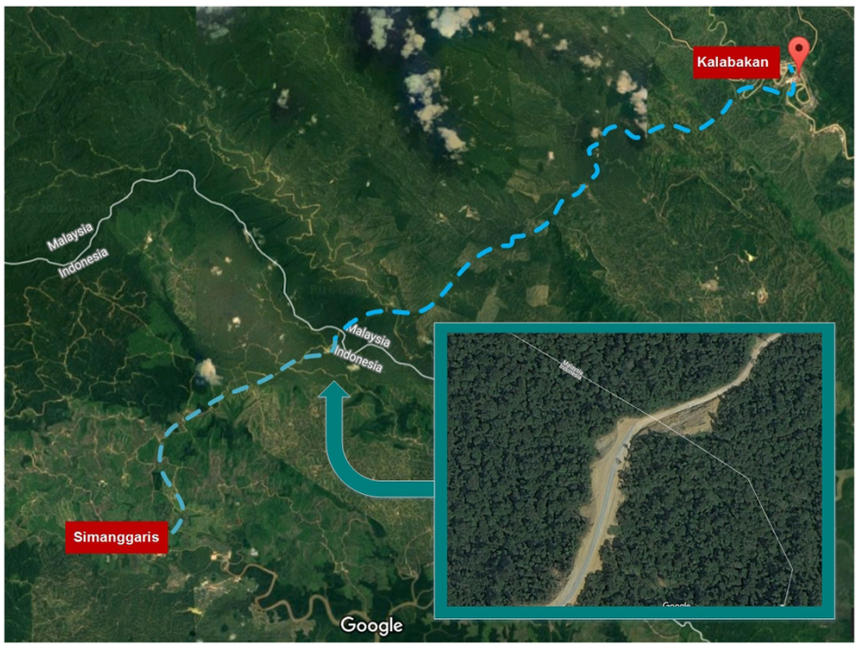
There are also preliminary plans in the Provincial Government of North Kalimantan's master plan to expand the network of interconnected roads to the province's borders with Sabah and Sarawak, which are described in Section 9.3.2 below.

[27] For details, see http://www.lpps.sabah.gov.my/?q=content/new-tawau-ferry-schedule-tawau-nunukan-tarakan.
[28] ADB is upgrading the 190 kilometers (km) from North Kalimantan's Tanjung Selor through Malinau to the border at Simanggaris, as part of the link roads between Simanggaris and Serudong in Sabah.

Figure 8.2. Land and Sea Routes between Sabah and North Kalimantan

Source: Based on Google Maps.

Figure 8.3. Road Crossing between Sabah and North Kalimantan



Source: Adopted from Google Maps.

PART IV

Government Objectives

Summary

Sabah's development plans are closely aligned with Malaysia's Economic Transformation Program and the national key economic areas to transform the country into a high-income nation by the year 2020. The country's most recent development plan, the Eleventh Malaysia Plan, builds on the so-called National Transformation Policy 2011–2020, which focuses on the implementation of the New Economic Model. It sets the achievement of a high-income, inclusive, and sustainable economy as the country's principal goal.

Sabah's current government plans consist of the Sabah Development Corridor, which was introduced in 2008, and the Sabah Structure Plan 2033, which was launched in October 2016. In their current stage of implementation, they are guided by the Eleventh Malaysia Plan for 2016–2020. The Sabah Structure Plan 2033 was launched in October 2016 to help guide the state development process. It contains a detailed strategy for the development of air, road, and rail connectivity in the state; sector strategies for industrial zones for manufacturing activities, tourism and medical tourism in particular, agri-food processing, downstream activities in palm oil, the livestock industry, retail outlets, agriculture, and aquaculture. There are also specific development strategies for Sabah's four administrative divisions, namely, Tawau, Sandakan, Interior, Kudat, and the West Coast.

Indonesia's drive to develop cross-border trade and investment with Sabah is based on the recent introduction by the Government of Indonesia of a new border economic area program that aims to (a) lower poverty of the more disadvantaged border regions, where poverty rates are more than twice as high as in urban areas; (b) bolster economic growth of those areas, whose expansion has been 20% lower than the country as a whole; and (c) reverse the trend toward increasing congestion and agglomeration in major cities. North Kalimantan is seen as the pilot project and demonstration case for key areas of the country bordering Malaysia, Timor-Leste, and Papua New Guinea.

The North Kalimantan provincial government's commitment to the central government's border area development program is motivated by the desire to transform the province's resource-based economy, currently driven by external demand for its raw materials, into more productive, high value-added industries, with widespread and enhanced investments, more technology-based industries, and a knowledge-based labor force.

9

Indonesia

9.1 Indonesia's New Border Area Program

In 2016, the Government of Indonesia introduced a new border economic area program that aims to (a) lower poverty of the more disadvantaged border regions, where poverty rates are more than twice as high as in urban areas; (b) bolster economic growth of those areas, whose expansion has been 20% lower than the country as a whole; and (c) reverse the trend toward increasing congestion and agglomeration in major cities. Indonesian President Joko Widodo has prioritized key areas bordering Malaysia, Timor-Leste, and Papua New Guinea, PNG. North Kalimantan has been designated a high-profile demonstration pilot project for the program.

The border area development program will achieve its goals through three channels:

- First, greater employment and more value-added activities will improve living standards, reduce poverty, and lower inequality in the targeted border areas.
- Second, faster economic growth will be brought about by increased productivity associated with economies of scale and production complementarities with its neighboring countries.
- Third, accelerated border activity will reverse the negative investment effects from agglomeration of activities in the major urban centers of Jakarta, Surabaya, and Bandung, where population density is over 15,000 persons per square kilometer (km^2), compared with only 10 persons/km^2 in Papua and 32 persons/km^2 in West Kalimantan.

The government's border area development initiative refers to the new economics of geography and its inclusive socioeconomic approach to border area advancements. It refers to a network of activities that seek to promote cross-border trade and investment and encourage economic and social development of areas along the border. Underlying this strategic goal are four channels through which border economic areas bolster socioeconomic well-being:

1. Incoming investment transfers know-how and technology, and thereby helps the border areas move up the value chain, expand skilled labor requirements, and raise wages and salaries.
2. Balanced growth between border regions and urban centers promotes income equality and reduces welfare disparities.
3. Improved welfare and employment along the border ameliorates possible sociopolitical instability that can spill over from neighboring countries.
4. Cross-border cooperation opens opportunities for wider regional cooperation, especially along subregional economic corridors.

The government's border area development program builds on the construction of seven state border checkpoints (PLBNs) in the provinces of West Kalimantan (Malaysia gateway),

East Nusa Tenggara (Timor-Leste gateway), and Papua (Papua New Guinea gateway). Some of the state border checkpoints have already been inaugurated by President Joko Widodo, while others are still waiting for official inauguration.

One of the underlying motivations for the establishment of North Kalimantan in 2012 as a separate state from that of East Kalimantan was the central government's interest in developing the border area adjacent to Sabah.[29] Under the new border development program, that motivation is being used to design and implement a border economic area in North Kalimantan that will serve as a model for other designated border areas.

9.2 North Kalimantan's Takeoff Stage of Development

President Jokowi set out an ambitious agenda for North Kalimantan at the Limited Meeting on the Evaluation on Implementation of National Strategic Projects and Priority Programs in North Kalimantan Province on 21 March 2017. The plan is to diversify the provincial economy to reduce its dependence on relatively few commodities whose markets are subject to large price fluctuations. Special emphasis is to be given to the agricultural sector as one of the engines of growth, as a means of reducing the province's dependence on unstable mineral markets.

At the meeting, President Jokowi also underscored the need to develop downstream activities in all industries to expand value added and reduce dependence on primary commodity exports. In infrastructure, he asked that special attention be given to connectivity, including improvements to Juwata airport in Tarakan and Sebatik airport on Sebatik island; the expansion of clean drinking water to 73% of the provincial population that currently lacks access to such water, especially in Nunukan, Malinau, and Tana Tidung regencies; and construction of the necessary infrastructure to provide electricity to domestic industries and households.

As the youngest Indonesian province, North Kalimantan's industries are at an early stage of development. As such, its economic takeoff is being led by relatively few industries:

- Production is concentrated on abundant resources in minerals (coal, gold, oil and gas, limestone, and quartz), forestry (9.3 million acres), agriculture (oil palm, rubber, coconut, rice, cocoa, pepper and coffee), and fisheries (capture fisheries and fish farming).
- Exports are concentrated on a few unprocessed products, specifically crude palm kernel, bituminous coal, fish and crustaceans, crude palm oil, sawn wood, wood panels, plywood, and fresh and frozen fish and crustaceans.

The North Kalimantan provincial government's commitment to the central government's border area development program is motivated by the desire to transform the province's resource-based economy, currently driven by external demand for its raw materials, into more productive, high-value added industries, with widespread and enhanced investments, more technology-based industries, and a knowledge-based labor force. The present pre-feasibility study supports that objective with the identification of specific projects making up a cluster

[29] Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

of integrated activities that promote increased commerce between North Kalimantan and Sabah, and ultimately help North Kalimantan's industries produce innovative goods and services at the technology frontier.

The challenge for the government is to integrate different sector and industry development projects into a cohesive strategic plan that is internally consistent and supportive of each component.

9.3 Provincial Development Plan

The government's current 2020 master plan for North Kalimantan consists of the following components:[30]

- Development of its oil and gas and mineral resources.
- Forestry conservation and selective development of wood processing industry.
- Plantation development in oil palm, coconut, coffee, cocoa, rubber, pepper, rice, maize, and soybeans.
- Expansion of aquaculture and fisheries production activities. The plan concentrates on the capture or farming of fish and crustaceans, especially in the form of shrimp and prawns, and seaweed harvesting and processing.
- Tourism development in the areas of ecotourism, cultural and historical tourism, recreation aquatic tourism, and sports and adventure tourism.

Overall, it seeks to eliminate poverty and unemployment, and to increase competitiveness in sustainable agro-processing industries, tourism, and mining. These goals can be achieved through (a) improvements in human resources capacity, (b) infrastructure improvements, (c) increased interconnectivity, (d) improvements in border security and in combating illegal business practices, and (e) in encouraging transparency in governance.

There are 10 types of infrastructure projects in the government's master plan:

1. Construct border area roads, bridges, and telecommunication facilities;
2. Improve rural airports, construct the Sebatik Island airport, and extend the runways of the international airports in Juwata Tarakan and Tanjung Harapan Tanjung Selor;
3. Install drinking water systems and sanitary facilities;
4. Construct river and seaports;
5. Develop education and health care facilities;
6. Provide infrastructure in rice and other food estates.
7. Establish industrial zones and an international port at Tenah Kuning;
8. Construct gas power plant of 31 megawatts (MW) (upgradable to 35.000 MW) and a hydroelectric power plant of 10.060 MW;
9. Construct bridge connecting Tarakan to the mainland in Bulungan Regency;
10. Build new capital city of Tanjung Selor.

The sections below describe six of the projects that have high priority in the province's border development program and commercial relations with Sabah.

[30] Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

9.3.1 Hydroelectric Power

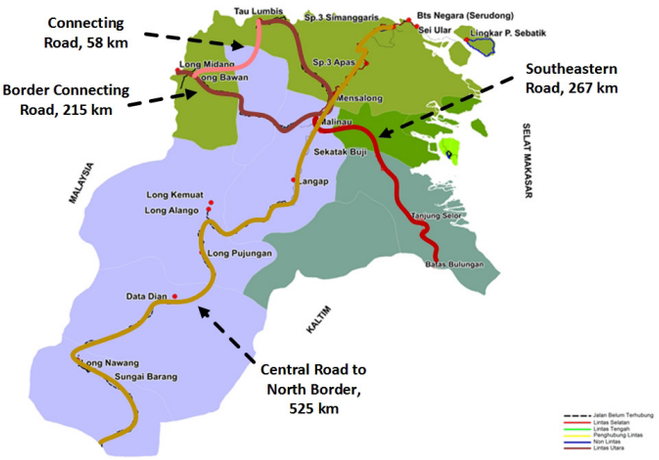
Electricity power remains one of the major problems in the province. There is a general lack of interconnectivity of power lines throughout the province. As a result, over 60% of the population, especially those located in rural areas, lacks access to electricity. In Tarakan, the PT. PLN Persero power plant lacks sufficient capacity due to very limited gas supplies from PT MKI. Complicated licensing procedures and laws governing land acquisition prevent investors from developing electricity power systems, and investors in other industries are weary of entering the market because recurrent blackouts give rise to interruptions of production activities.

Hydroelectric power plants are proposed along Kayan River in Bulungan Regency, Mentarang river in Malinau Regency, and Sembakung river in Nunukan Regency, with the following capacities:

- Kayan river (Bulungan Regency): one plant with 6,080 MW capacity; the other with 50 MW capacity;
- Mentarang river (Malinau Regency): 3,430 MW capacity plant; and
- Sembakung river (Nunukan Regency): 500 MW capacity plant.

9.3.2 Border Road Network

Figure 9.1. North Kalimantan Border-Connecting Road Network



km = kilometer.
Source: Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

The government's master plan proposes the construction of a network of interconnected roads to the province's borders with Sabah and Sarawak (Figure 9.1). The central road to the Sabah border traverses the province and connects to East Kalimantan along 525 kilometers (km) of paved road. The western border road connects to Sabah's Interior Division at the border town of Tau Lumbis, as well as Sarawak state of Malaysia at the border town of Long Midang.

According to the latest reports, a special economic zone to be named the Lundayeh Economic Zone is planned for linking North Kalimantan to both Sabah and Sarawak at the western border road connection. It would connect Long Bawan to Pa Betung and then to Pa Bank, which connects to the Sabah border town of Long Pasia. The special economic zone is an initiative of the Lun Taw Sabah Sarawak Chamber of Commerce, based in Kota Kinabalu. The plan is for the Lundayeh Economic Zone to focus on agriculture and eco-health tourism.[31]

[31] *The Borneo Post*. 2017. Lundayeh economic zone in the making. 6 May. https://www.pressreader.com /malaysia/the-borneo-post-sabah/20170506/281775629066520.

There is also a 58-km road that directly connects these two border towns. Each border crossing road connects to the central towns of Malinau and Mensalong, and the southeastern road connects Tanjung Selor, the capital, with those two central towns.

9.3.3 Border and International Airports

Border airports aim to provide a method for distributing goods quickly to commercial centers in North Kalimantan. The airports are to be situated in three locations where airstrips currently exist:

- In Nunukan Regency, Long Layu town where there is currently an airstrip at 3° 52' 60" N / 116° 28' 0" E.[32]
- In Tana Tidung Regency, Sesayap town at 3° 36' 0" N / 117° 3' 0" E.
- In Bulungan Regency, Bunyu airport in Bunyu Island, a district of the regency, at 3° 52' 69" N / 117° 82' 06" E.
- In Malinau Regency, the following locations:
  - Long Apung town where there is currently an airstrip at 3° 57' 57" N / 116° 61' 93" E, and Robert Atty Bessing Airport in the town of Malinau.[33]
  - Kayan Hilir district, at 2° 7' 24" N / 114° 57' 6" E along the border with Sarawak in the state of Malaysia.
  - Sungai Boh district, at 0° 52' 60" N / 115° 00' 00" E.
  - Bahau Hulu district, at 3° 11' 24" N / 115° 43' 37" E.
  - Mentarang Hulu district at 3° 50' 09" N / 116° 08' 21" E.

Figure 9.2. Location of Planned Sebatik Island Airport

Source: Adopted from Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

Each of these border airports will connect to Tarakan airport and Tanjung Harapan Airport in Bulungan Regency.

Sebatik Island airport construction is in the early stages of development (Figure 9.2). The island is partly within North Kalimantan in the south and Sabah in the North.

Juwata Tarakan's Juwata International Airport runway extension is underway (Figure 9.3), while Tanjung Harapan Airport in Tanjung Selor will have its runway extended from 1,200 to 2,400 meters with a

Figure 9.3. Tarakan Airport Runway Extension

Source: Adopted from Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

[32] For video feed of airstrip landing, see https://www.youtube.com/watch?v=lj2aw2zjdlA.
[33] For video feed of airstrip landing, see https://www.youtube.com/watch?v=M8Ek0bvAvUg.

45-meter width, as well as its airport terminal facilities substantially upgraded to reflect its status of serving the province's capital.

9.3.4 Water and Sanitary Facilities

Over 10% of North Kalimantan's population receive their water from unsafe sources like rivers and unprotected wells and springs. Another 22% obtain their water from rain, which is the second highest proportion of rainwater sourcing among all Indonesian provinces.[34] Hence, the government plans to expand access to clean drinking water.

Among the major projects to expand access to safe water are the following:[35]

- Tarakan City reservoir expansion
- Water extraction pumps, pipes, and generators from rivers and ponds located in Nunukan

There is less focus on sanitation facility than access to safe water. The reason may be the relatively high proportion of households with a private toilet. North Kalimantan ranks fourth among the provinces with the higher proportion of households with private toilets.[36]

9.3.5 Port and Harbor Development

There are several projects to develop or upgrade seaports and river docks throughout the province, given the province's large coastal area and network of rivers:

- *Pesawan, Bulungan*: Development of port facilities for loading and unloading cargo
- *Tunon Taka, Nunukan*: Local port development
- *Malundung, Tarakan*: Local port development
- *Sebatik, Nunukan*: Local port development
- *Tanah Kuning, Bulungan*: International port development
- *Bebatu, Tana Tidung*: Local port development

9.3.6 Health Care

The only hospital in the province is in Tarakan city. There are no hospitals in the four regencies of North Kalimantan. As a result, residents often seek treatment in neighboring provinces or other countries, including Sabah in Malaysia. To address some of the most basic needs, the government plans to develop primary health care facilities in remote and border areas, for example, in Long Apung, Long Bawan, and Tau Lumbis. Additionally, a provincial hospital is to be built in Tanjung Selor, the capital.

[34] Based on data for 2015 from BPS - Statistics Indonesia. Percentage of Households by Province and Source of Drinking Water, 2000–2015. https://www.bps.go.id/linkTabelStatis/view/id/1361.
[35] Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.
[36] Based on data for 2015 from BPS - Statistics Indonesia. Percentage of Households by Province and Source of Drinking Water, 2000–2015. https://www.bps.go.id/linkTabelStatis/view/id/1361.

10

Malaysia

10.1 The Eleventh Plan

Sabah's economy remains heavily dependent on the extraction of natural resources and land-based activities. The state government derives most of its revenue from sales taxes on crude palm oil and petroleum royalties. The depletion in forestry resources has reduced the contribution to the state's revenue from the forestry sector from over 50% of the state's revenue prior to 1998. However, it remains the fourth largest contributor to state government's revenue. Similarly, the state's export revenue is dependent on a narrow set of resource-based activities, with petroleum and palm oil contributing over 80% of total export earnings, and wood and fish-based products like plywood and frozen fish adding another 6% to total earnings.

Sabah's development plans are closely aligned with Malaysia's Economic Transformation Program (ETP) and the national key economic areas (NKEAs) to transform the country into a high-income nation by the year 2020. The country's most recent development plan, the Eleventh Malaysia Plan, builds on the so-called National Transformation Policy 2011–2020, which focused on the implementation of the New Economic Model (NEM). It set the achievement of a high-income, inclusive, and sustainable economy as the country's principal goal.

The NEM focused on seven strategic targets: (a) greater reliance on productivity to drive growth; (b) shifting from state-led to private-led investment and production; (c) achieving greater local autonomy, with accountability; (d) achieving greater economies of scale from clustering; (e) attracting technologically capable firms; (f) targeting emerging Asian and Middle Eastern markets; and (g) promoting skilled talent. These targets were, in turn, to be achieved through the following channels: (i) private-sector-driven growth; (ii) a quality workforce; (iii) a competitive domestic economy; (iv) a strengthened public sector; (v) a transparent and market-friendly affirmative action; (vi) a larger knowledge base and infrastructure; (vii) diversifying sources of growth; and (viii) ensuring sustainable growth.

The Eleventh Malaysia Plan defines six strategic drivers to transitioning the country into the type of advanced economy that the NEM envisioned: (a) greater inclusiveness in an equitable society; (b) improved well-being for all people; (c) enhanced human capital development; (d) green-based growth; (e) strengthened infrastructure that supports economic expansion; and (f) economic growth derived from knowledge-intensive services, productive manufacturing, and a modernized agriculture.[37]

[37] Government of Malaysia. 2015. *Eleventh Malaysia Plan 2016–2020: Anchoring Growth on People*. Kuala Lumpur.

Additionally, there are six channels through which these objectives are to be achieved: (i) expanded productivity to accelerate economic growth; (ii) innovative methods of generating revenue; (iii) the promotion of technical and vocational education and training (TVET) as a means of developing a high-skilled work force; (iv) use of cities as a source of competitiveness; (v) expanded well-being of the bottom 40% household income group; and (vi) green growth to achieve long-term sustainability of the environment.

Among these different channels, two stand out in terms of their direct importance to Sabah's trade in goods and services with North Kalimantan. These channels are described in the two sections that follow.

10.1.1 Productivity Expansion

Malaysia's approach to productivity will shift from primarily government-driven initiatives at the national level to targeted actions across the public sector, industry players, and individual enterprises. The objective is to substantially raise Malaysia's productivity and bring it in line with more advanced economies. Currently, Malaysia lags behind countries like the Republic of Korea and the United States, where productivity in 2013 was 56% and 32% higher than that of Malaysia.

At the national level, productivity-linked incentives are being introduced and regulatory reforms accelerated. At the industry level, industry champions are driving the process industry-specific productivity initiatives, while incentives and skills development programs are being provided at the enterprise level. The approach shifts the previous fragmentation of initiatives at the national level to focused and comprehensive strategies at national, industry, and enterprise levels.

While government championed initiatives in the past, industry-level champions are now driving the process with the support of the National Productivity Council. Also, the process has shifted from a narrow manufacturing- and service-focused approach to include all sectors, including services, construction, and the public sector itself. Regulations are to be linked to productivity improvements.

Economic sectors will increasingly emphasize more knowledge-based, high-value activities, especially in the following industries:

- Health care
- Halal foods
- Information and communication technology
- Ecotourism
- Downstream activities in chemical, electrical and electronics, and machinery and equipment
- Modernization of agriculture

The following outcomes are expected from the proposed initiatives to improve productivity:

- Labor productivity is to rise by 20% between 2015 and 2020;
- Average monthly household income is to increase by 72% between 2014 and 2020;

- The ratio of employee compensations to gross domestic product (GDP) is to increase by 5 percentage points between 2015 and 2020.
- The Malaysia Well-Being Index (MWI), which measures the general well-being of people, is targeted to rise by 1.7% in each year of the Eleventh Plan.[38]

10.1.2 Skilled Labor and Technical and Vocational Education and Training

An expansion of real GDP by 5%–6% annually during the Eleventh Plan is expected to occur largely through the continued shift from labor-intensive production to knowledge- and innovation-based economic activities. That shift will require a much larger skilled labor force than the one that currently exists in Malaysia. The Eleventh Plan anticipates the creation of 1.5 million new jobs, 60% of which will require skilled labor. That expansion means an additional 900,000 workers will require skills training, with annual TVET intakes increasing from 164,000 in 2013 to 225,000 in 2020.

Moreover, the Eleventh Plan underscores the need to better align knowledge, skills, and attitudes with industry requirements, and to develop TVET services with the following characteristics:

- Quality standards for both public and private TVET services
- Industries help with curriculum designs, delivery, and job placements
- Attitude changes in how TVET is viewed by secondary school graduates deciding on career paths
- TVET able to attract students with high academic qualifications
- Increased access to innovative, industry-led training programs

Several changes in the TVET system have been put in place to achieve the above objectives:

- A single qualification system has been introduced for the two accreditation agencies, Malaysian Qualifications Agency and Department of Skills Development.
- A single rating system has been instituted for both public and private TVET institutions.
- The design and delivery of curriculum is increasingly being led by industries, in partnership with TVET institutions and the government.
- Centers of Excellence in niche areas of expertise are being developed.
- TVET promotion campaigns are being introduced to transform TVET perception toward premium career choices by students.
- The government will expand the Productivity Linked Wage System to ensure that wages are based on qualifications, skills, and productivity criteria.

The following outcomes are expected from the proposed initiatives to improve TVET and higher education:

[38] Note that the MWI has a base of 100 in 2000 and by 2014 it equaled 125.6. A 1.7% rise in the index would mean that by 2020 the MWI should be 138, or 7% greater than the MWI in 2016. For historical information on the MWI and other indicators of Malaysia, see The Prime Minister's Department, Economic Policy Unit. 2016. *The Malaysian Economy in Figures 2016*. Kuala Lumpur.

- Labor productivity growth to accelerate from 2.6% a year in the Tenth Plan to 3.7% a year in the Eleventh Plan.
- Intake of TVET students to increase from 164,000 in 2013 to 225,000 in 2020.
- In higher education, at least two universities in Malaysia are to rate among the top 100 QS World University Rankings.[39]

These goals are largely based on the Malaysia Education Blueprint that was launched in 2015 for higher education, and which is currently undergoing a mid-term review.[40] It outlined a comprehensive transformation in the educational system, which included as one of its seven major shifts that the previous focus on university education change to a situation where academic and TVET pathways are equally valued and cultivated.

10.2 Sabah's Development Corridor and Structure Plan, 2033

Sabah's current government plans consist of the Sabah Development Corridor (SDC), which was introduced in 2008, and the Sabah Structure Plan 2033, which was launched in October 2016. In their current stage of implementation, they are guided by the Eleventh Malaysia Plan for 2016–2020.[41]

10.2.1 Sabah Development Corridor

The SDC covers the entire state and contains six strategic development areas. The SDC is aligned with the ETP and the NKEAs to transform Malaysia into a high-income nation by the year 2020. Key focal areas of the SDC are agriculture, tourism, logistics, and manufacturing; oil, gas, and energy; and higher education and palm oil.

The objectives of the SDC is to make Sabah a gateway for trade, investment, and tourism, as well as to make the state more technology based. It seeks to move the state's economic activities in a direction that generates higher value output of goods and services. It aims to rationalize and coordinate activities across the state's different subregions and growth centers. It depends on key drivers related to human capital development, infrastructure and utilities, policies and regulations, and fiscal incentives. Its six strategic development areas are as follows:

- Kinabalu Gold Coast Enclave (tourism)
- Brunei Bay Integrated Development (energy)
- Interior Food Valley (livestock)
- Bio-Triangle (R&D)
- Agro-Marine Belt (marine resources and palm oil industry)
- Oil and Gas Clusters

[39] The rankings are based on six performance indicators across four areas: research, teaching, employability, and internationalization. For details, see QS Top Universities. QS World University Rankings. https://www.topuniversities.com/qs-world-university-rankings/ methodology.

[40] Government of Malaysia. *Malaysia Education Blueprint, 2013–2025*. http://www.moe.gov.my/images/ dasar-kpm/articlefile_file_003108.pdf.

[41] Government of Malaysia. 2015. *Eleventh Malaysia Plan 2016–2020: Anchoring Growth on People*. Kuala Lumpur.

10.2.2 2016–2025 Development Stage

For 2016–2025, the SDC aims to establish Sabah as a leading economic center in Asia, focusing on the following industries:

- Agro-processing, including palm oil
- Marine industry
- Livestock
- Oil and gas
- Manufacturing
- Tourism
- Creative industry
- Information and communication technology
- Education

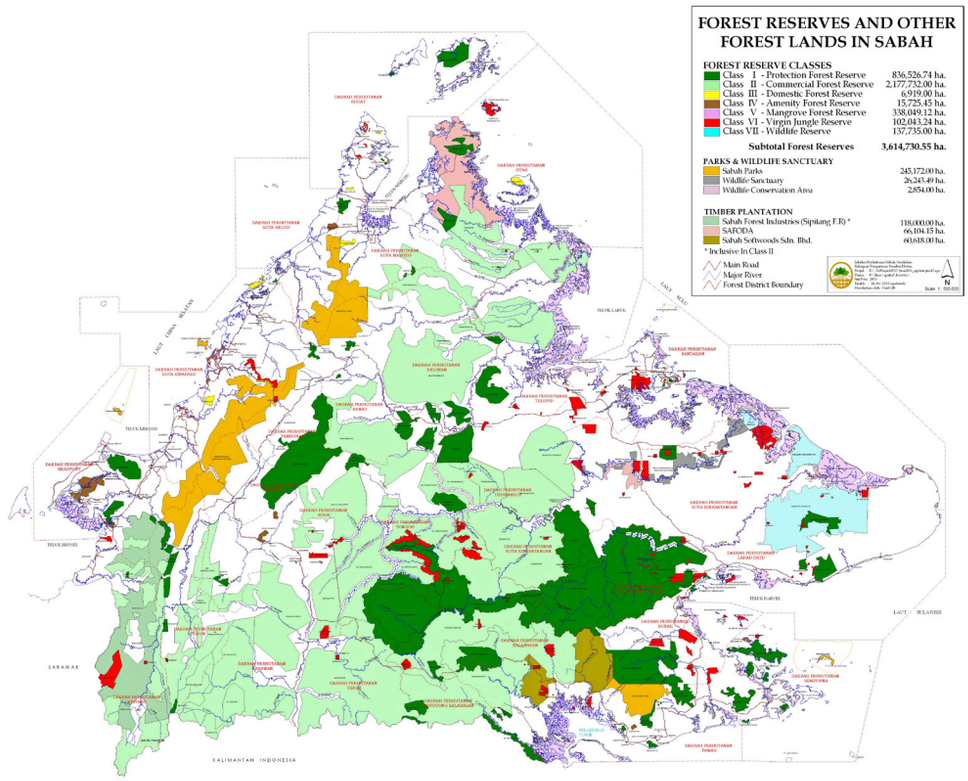
10.2.3 2016–2025 Sector Strategies

In agriculture, the government is promoting investment in large commercial estates that create economies of scale, enhance productivity, and adopt sustainable methods of production. It is also seeking to expand cost-efficient agro-processing activities that ensure international price competitiveness of the agricultural products. Finally, the government is promulgating support services and infrastructure. Priority is given to investments that emphasize the reduction in production costs in both upstream and downstream activities through efficiency and productivity gains. Incentives favor advancements in production technologies, adoption of labor-saving technologies, upgrades to support facilities such as bulking installations and port services, and the supply of quality planting materials. Tax incentives are given to those activities that encourage diversification in the processing industry, including those activities that produce high value-added consumer products.

In fisheries, Sabah is a net exporter of fish. With the current trend toward depleting marine fish stocks along the coastal areas where most fishing activity takes place; the state government has identified fishing zones known as aquaculture industry zones and marine sanctuaries to breed and increase fish stocks. There is therefore a growing need for upstream activities in deep-sea fishing, shrimp farming, marine fin-fish cage culture, cultivation of seaweed, and lobster and crabs to expand activities in canned marine products, fishmeal, fertilizers, pharmaceuticals, halal seafood, surimi-based processing, and convenience foods. Tax incentives, pioneer status, and the investment tax allowances, are offered to spawning, breeding, and culturing of aquatic products, off-shore fishing, and processing of fishery products.

In *forestry*, the State Government of Sabah has established its overall policy framework within sustainable forest management guidelines through long-term forest development programs (Figure 10.1). It has adopted a five-pronged policy action plan covering conservation through (i) prudent management of all forest areas, (ii) aggressive reforestation, (iii) research and development, (iv) funding forest activities, and (v) upgrading of manpower training programs. All activities in the forestry sector covered under the Sustainable Forest Management License Agreement must be certified under any credible certification scheme and have reduced impact logging. Nevertheless, earlier forest depletion has severely reduced the state's natural forest area, and timber is in short supply for downstream industries.

Figure 10.1. Sabah Forest Lands



Source: Sabah Forest Department. Sustainable Forest Management in Sabah. http://www .forest.sabah.gov.my/discover/sustainable-management/sfm-in-sabah.

In manufacturing, the vision is to make Sabah the location of choice in Asia for resource-based manufacturing by 2025. Resource-based industries being promoted include wood-based, palm oil, cocoa, and processed-food industries like meat, marine products, dairy foods, vegetables, and fruits. Non-resource-based industries include electrical and electronics, processed silica sand, machinery and equipment, boat construction and repairs, and the petrochemical industry.

In services, medical tourism and higher education are to become leading sectors in the state. Southeast Tawau is being established as a medical tourism hub, while Kota Kinabalu is to be the state's central hub for medical tourism. International higher education and TVET are both at an infant stage of development, but the state has a large and well-established education base from which to reach a takeoff stage of development by 2020.

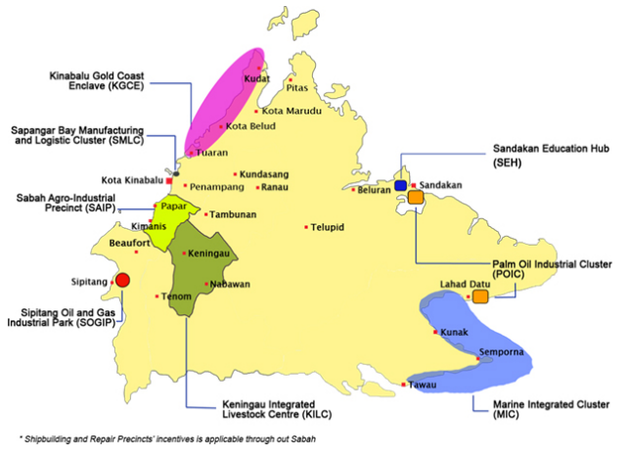
10.2.4 2016–2025 Programs

The major programs during 2016–2025 cover the following initiatives (Figure 10.2):

- Sandakan–Kinabatangan–Beluran Bio-Triangle: Sandakan Education Hub, Sandakan Palm Oil Industrial Cluster, Bandar Samudara Elopura and Wildlife Conservation

- Development of Kinabalu Harbor Front and Gold Coast Enclave
- Integration of logistics and transportation infrastructure, along with reductions in the cost of doing business
- Development of the Interior Food Valley to commercialize rice, fruits, and livestock production
- Development of Agro-Marina Belt in POIC Lahad Datu for production of seafood and aquaculture
- Development of the Oil and Gas Industry Cluster
- Environmental rehabilitation and conservation: Eco-design promotion, carbon footprint reduction (green technology), and biodiversity conservation
- Brunei Bay Development Zone: Multimodal logistics and transportation, halal industry, Sabah Agri-industrial precinct, sailing, and seaports
- Agropolitan projects for the rural poor[42]
- Participation in trade fairs and investment promotions
- Promotion of new growth sources through the application of pioneering technology in the SDC, including information and communication technology, biotech, and nanotechnologies
- Establishment of one-stop service center for the SDC and a business desk for small and medium-sized enterprises, start-ups, and Bumiputera Commercial and Industrial Community

Figure 10.2. Major Programs of Sabah Development Corridor



Source: Sabah Economic Development and Investment Authority. Major Programs of SDC. http://www.sedia. com.my/major_programmes.html.

10.3 Strategy for Manufacturing Sector

The 2025 vision for the manufacturing sector is for Sabah to be Asia's location of choice for resource-based manufacturing. To achieve this vision, several programs have been identified over three phases to stimulate growth of existing industries and attract private sector investments in targeted areas.

- *Phase 1 (2008–2010)* focused on the creation of basic infrastructural, human capital development, and pro-business incentives for companies to shift to higher order value-added activities in Sabah.

[42] Agropolitan development balances urban and rural growth through the development of cities and farm communities that are close to one another. The agropolitan concept has been adopted as a strategy of regional development in Malaysia since 2006. The country's agropolitan programs are implemented by the Ministry of Rural and Regional Development and Public Private Cooperation Unit under the Prime Minister's Department (See Y. Ahmad, H. Saad, and M. Bahrudin. undated. Agropolitan Development Programs in Malaysia at the Crossroads. Department of Urban and Regional Planning, Faculty of Built Environment, Universiti Teknologi Malaysia, Johor Bahru.)

- *Phase 2 (2011–2015)* focused on linking small and medium-sized enterprises to the supply chain of large-scale companies. The Sandakan Education Hub was developed to promote local knowledge about resource-based technologies, and therefore to support TVET.
- *Phase 3 (2016–2025)* is promoting Sabah as the location of choice by Asian companies for resource-based manufacturing. Development of the manufacturing industry is expected to contribute significantly to the state's GDP by creating high-value employment and supporting a dynamic manufacturing base.

10.4 Sabah Structure Plan 2033

The Sabah Structure Plan 2033 (SSP2033) was launched in October 2016 to help guide the state toward "becoming a world-class environment for living, working, studying, visiting, and a conducive place for business investment that will create job opportunities."[43] It contains a detailed strategy for the development of air, road, and rail connectivity in the state; sector strategies for industrial zones for manufacturing activities, tourism and medical tourism in particular, agri-food processing, downstream activities in palm oil, the livestock industry, retail outlets, agriculture, and aquaculture. There are also specific development strategies for Sabah's four administrative divisions, namely, Tawau, Sandakan, Interior, Kudat, and West Coast. Figure 10.3 presents the summery mapping of SSP2033, which is discussed extensively through this study.

Figure 10.3. Sabah Structure Plan 2033 Summary Map

Source: Town and Regional Planning Department Sabah. 2016. *Sabah Structure Plan 2033*. Kota Kinabalu, Sabah. October.

[43] Town and Regional Planning Department Sabah. 2016. *Sabah Structure Plan 2033*. Kota Kinabalu, Sabah. October.

PART V

Economic Analysis of Traded Goods

Summary

Sabah and North Kalimantan have complementary economies. In traditional trade, they each have comparative advantages in different types of products; and, in modern trade theory, they focus on trade in similar goods, giving rise to intra-industry trade and network effects from the use of goods and services.

Sabah's exports are more diversified across section headings than those of North Kalimantan. They cover petroleum and petroleum products, vegetable oils and fats, organic chemicals, wood, wood manufactures, processed vegetable oils and fats, fish and crustaceans, iron and steel, and machinery. In contrast, North Kalimantan's are highly concentrated in two categories: vegetable products and mineral products, which together account for 94% of total exports. Food and food products, and wood and wood products represent nearly all the remaining 6% of exports.

Comparative Advantages: North Kalimantan's exports reveal that it has a comparative advantage in 14 products. These products can be classified into palm kernels and crude palm oil, coal, shrimp and other crustaceans, and wood and wood panels. Sabah has a comparative advantage in the production and export of natural resource intensive and unskilled-labor intensive products. The areas where Sabah's exports are revealed to have a comparative advantage are in the exports of (a) palm oil products, (b) crustaceans, and (c) processed wood. Hence, Sabah's industries are narrowly concentrated in three industries and that level of concentration has given Sabah a comparative advantage in the exports of their products.

Competitiveness: One of the major macroeconomic determinants of trade and cross-border investments is international price competitiveness. Since 2010, Malaysia's real cross-rate of the ringgit against the rupiah has trended upward, suggesting a real exchange rate depreciation, that is, an improvement in the export competitiveness of Sabah and the rest of Malaysia. In contrast, Indonesia's rupiah has strengthened somewhat against the ringgit in real terms, resulting in a deterioration in North Kalimantan's exports to Sabah and the rest of Malaysia. It is noteworthy, however, that movements in the bilateral real exchange rate have stabilized in 2016 and this change may signal a change in the medium- to long-term competitiveness of exports from Sabah and North Kalimantan. The new trend appears to have stabilized, with the price competitiveness of their respective exports perhaps remaining unchanged in the near to medium term.

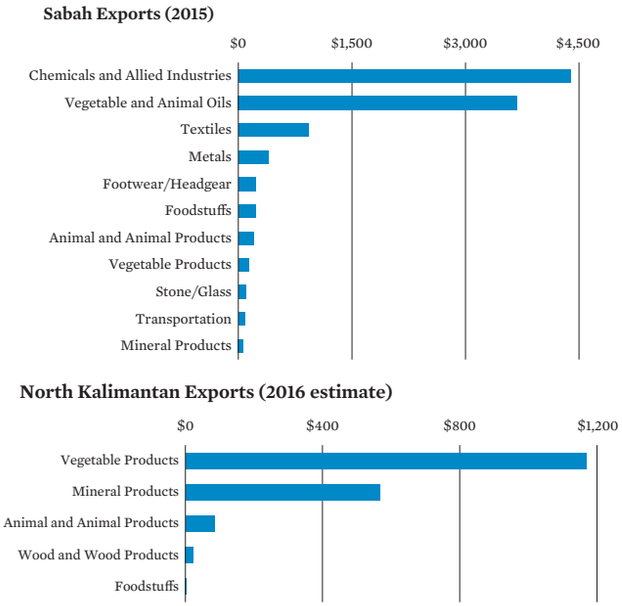
11

Export Characteristics

11.1 Major Exports of North Kalimantan and Sabah

The major exports of North Kalimantan and Sabah are shown at three levels: (a) broad Harmonized System (HS) section headings; (b) 2-digit HS chapter headings; and (c) 6-digit HS subheadings. The following are the noteworthy observations about Sabah's and North Kalimantan's exports at each classification level.

Figure 11.1. Sabah and North Kalimantan's Exports by Harmonized System Section Headings



Source: Based on data from Sabah and North Kalimantan customs authorities.

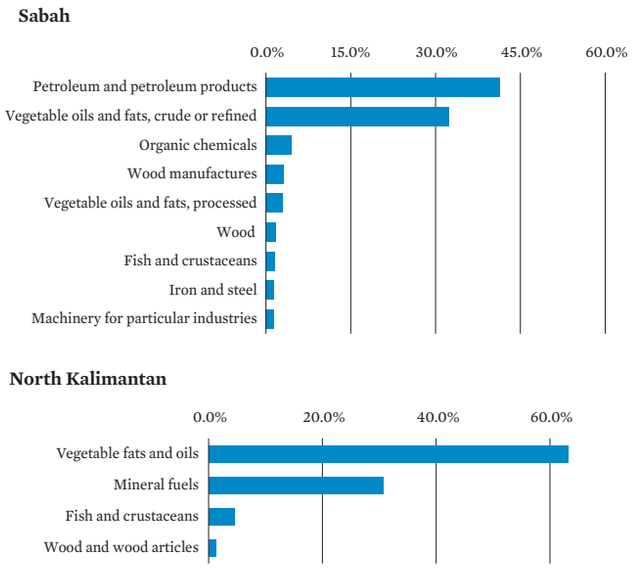
(a) North Kalimantan exports are highly concentrated in two categories: vegetable products and mineral products, which together account for 94% of total exports. Food and food products, and wood and wood products represent nearly all the remaining 6% of exports.

(b) Sabah's total exports are nearly 5 times greater than North Kalimantan's overall exports. In 2015, Sabah's merchandise exports were $10.5 billion, while North Kalimantan's exports in 2016 are estimated to have reached $1.85 billion.

(c) Sabah's exports are more diversified across section headings than those of North Kalimantan. Of the 21 HS section headings, Sabah has 8 section headings whose foreign exchange earnings represent at least 1% of the total value of exports. North Kalimantan only has four section headings whose export earnings accounted for 1% or more of total exports (Figure 11.1).

(d) Sabah's exports are largely concentrated in two HS sections: chemicals and allied industries, and vegetable and animal oils, which together account for 77% of total exports. Processed products in the form of manufactures, chemicals, and machinery and equipment together account for over 17% of the total; and primary products in the form of foods and minerals account for nearly 5% of total exports.

Figure 11.2. Sabah and North Kalimantan's Exports by Harmonized System Division Headings



Source: Based on data from Sabah and North Kalimantan customs authorities.

Table 11.1. North Kalimantan's Top 10 Export Products ($ million)

Palm kernel, crude (151321)	1,146.4
Coal nes (270119)	438.8
Bituminous coal (270112)	127.6
Fish and crustaceans (030617)	84.7
Palm oil, crude (151110)	22.0
Wood, continuously shaped (440929)	11.3
Panels, laminated wood (441299)	6.3
Plywood (441231)	5.7
Preparations of fish and crustaceans (160521)	1.9
Fish and crustaceans, frozen (030389)	0.7
Sub-Total	*1,845.5*
Others	*2.6*
Total Exports	***1,848.1***

Note: Figures in parenthesis refer to the 6-digit HS code.
Source: North Kalimantan customs authorities.

At the somewhat narrower 2-digit HS division level, there is a similarly large difference in export diversification between North Kalimantan and Sabah:

(a) There are 96 possible divisions under the Harmonized System (Figure 11.2). Sabah exports products in 94 of the 96 divisions, whereas North Kalimantan only exports products in 8 of the divisions.
(b) Sabah has nine HS sections that account for 1% or more of total exports: petroleum and petroleum products, vegetable oils and fats, organic chemicals, wood, wood manufactures, processed vegetable oils and fats, fish and crustaceans, iron and steel, and machinery.
(c) North Kalimantan has four HS sections that represent at least 1% of total exports: vegetable fats and oils, mineral fuels, fish and crustaceans, and wood and wood articles.

Finally, at the HS 6-digit product level of exports, the following are the main characteristics of North Kalimantan and Sabah exports:

(a) North Kalimantan product exports are concentrated in crude palm kernel, bituminous coal, fish and crustaceans, crude palm oil, wood, panels, plywood, preparations of fish and crustaceans (Table 11.1). The top two exported products, crude palm kernel and coal, account for 93% of all exports and fish and crustaceans contribute another 5% to the total. The top 10 product exports represent 99.9% of all export earnings. In effect, those 10 products can be classified into four types of products: (i) crude palm oil and kernel, (ii) coal, (iii) fish and crustaceans (fresh, frozen and prepared), and (iv) wood and wood products.
(b) Sabah's foreign exchange earnings from the top 10 exports represent 85% of all merchandise export earnings (Table 11.2).
    - Crude and refined palm oil accounts for 65% of export earnings.

- Seven of the products originate in the palm oil industry, and together they represent over 78 percentage points of the 85% combined earnings contribution of the top 10 products to total exports.
- The remaining three top-10 products belong to the wood processing and fisheries industries. Plywood export earnings account for 5% and frozen shrimp and prawns earnings account for 1.4% of total exports.

Table 11.2. Sabah's Top 10 Export Products
(RM million)

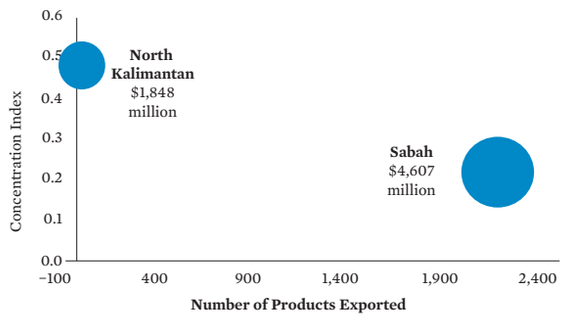
Palm oil, refined	6,824.3
Palm oil, crude	4,777.3
Palm kernel, refined	792.1
Vegetable oils	574.6
Plywood other than HS441231	524.5
Palm kernel, crude	465.5
Fatty acids from refining	436.1
Plywood of sheets of wood	340.8
Shrimp and prawns, frozen	243.8
Palm nut/kernel oil-cake	221.4
Sub-Total	*15,200.5*
Others	*2,781.9*
Total Exports	***17,982.3***

Source: Sabah customs authorities.

11.2 Size, Concentration, and Diversification

North Kalimantan's concentration of exports in a few number of products, relative to Sabah's considerably more diversified exports, is illustrated in Figure 11.3. It measures North Kalimantan's and Sabah's export concentration is terms of the Herfindahl-Hirschman product concentration index. The Herfindahl-Hirschman index calculates the degree to which a country's export earnings are either concentrated in a relatively few products or, alternatively, the extent to which they are diversified among many products.[44] In the case of North Kalimantan, which exports very few products and the top two exported products account for 93% of all exports, the Herfindahl-Hirschman concentration index approaches 1. In contrast, Sabah's exports are considerably more diversified among over more than 2,000 products, though crude and refined palm oil account for two-thirds of all export earnings. The size of the respective bubbles also shows that the size of Sabah's exports is much larger than those of North Kalimantan.

Figure 11.3. Sabah and North Kalimantan's Export Size, Concentration, and Diversification



Source: Based on data from Sabah and North Kalimantan customs authorities.

[44] *Herfindahl-Hirschman Product Concentration Index:* This index measures the concentration or, alternatively, diversification of a country's export products. The Herfindahl-Hirschman Product Concentration Index is defined as follows: $\frac{\sum_{k=1}^{n_i}\left(\frac{x_{ik}}{X_i}\right)^2 - \frac{1}{n_i}}{\frac{1}{n_i}}$

where X is the total value of exports from reporter I; x is the value of exports of product k from country I; and n is the number of products exported by country i.

A higher index (close to 1) indicates that exports are concentrated in fewer sectors, whereas a country with a completely diversified portfolio will have an index close to 0.

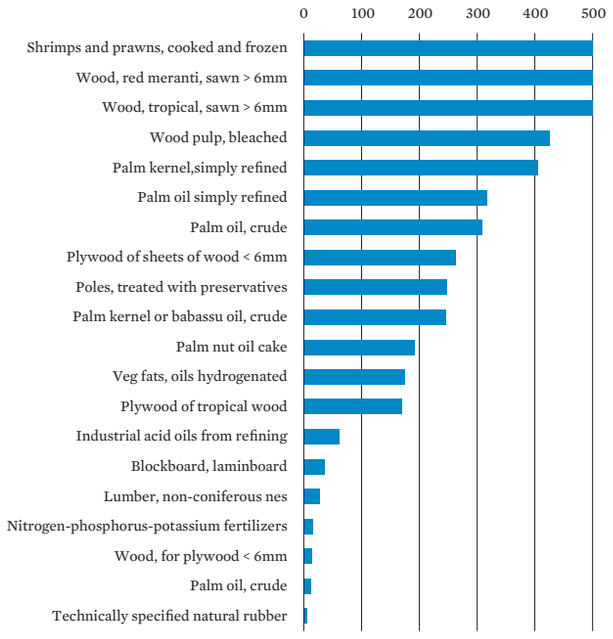
12

Competitive Advantages

12.1 Comparative Advantages

The nature of a country's exports and its specialization in the production and trade of products can be examined based on the index of revealed comparative advantage (RCA). The RCA measures a country's export intensity in each product relative to other countries in the world. The ratio of a product's export shares in the country relative to that in the world is taken as a measure of the comparative advantage. If the index is greater than 1, it is an indication that the country is internationally competitive in exporting the product being measured.

Figure 12.1. Sabah's Revealed Comparative Advantages of Top 20 Export Products



mm = millimeter, nes = not elsewhere stated.
Source: Based on data from Sabah customs authority.

Sabah has a comparative advantage in the production and export of natural resource intensive and unskilled-labor intensive products. The areas where Sabah's exports are revealed to have a comparative advantage are in the exports of (a) palm oil products, (b) crustaceans, and (c) processed wood (Figure 12.1). Hence, Sabah's industries are narrowly concentrated in three industries and that level of concentration has given Sabah a comparative advantage in the exports of these products.

North Kalimantan's exports reveal that it has a comparative advantage in 14 products (Figure 12.2). These products can be classified into palm kernels and crude palm oil, coal, shrimp and other crustaceans, and wood and wood panels. By far, its strongest advantage is in the production of crude palm kernels, where the RCA is near 6,000.[45] Coal has the second highest RCA, followed by frozen shrimp and prawns and by palm nuts and kernels. The next three highest ranking products are wood products in the form of continuously shaped wood, laminated wood panels, and plywood. In terms of product groupings, North Kalimantan

[45] In Figure 12.2, the RCA for palm kernels has been reduced to 185 to avoid distortions to the RCA presentations for the other products in which North Kalimantan has a comparative advantage.

has a comparative advantage in products that are within the following HS sections:

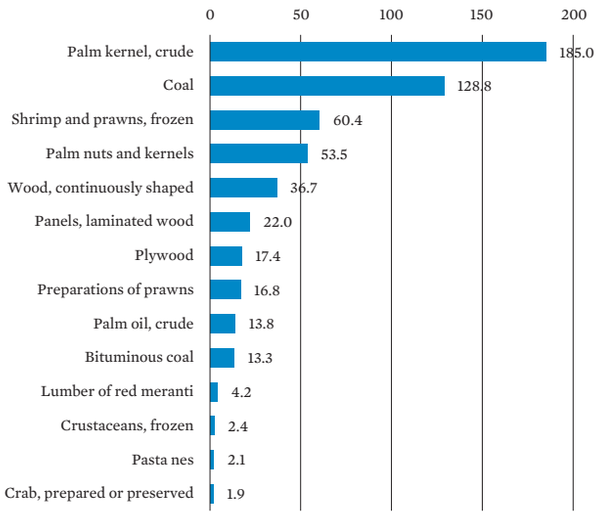
- *Fish and crustaceans*: frozen crustaceans, and frozen shrimp and prawns
- *Vegetable products*: crude palm kernels and crude palm oil
- *Foodstuffs*: prepared and preserved crabs, preparations of shrimp and prawns, and pasta
- *Mineral products:* coal, anthracite coal, and bituminous coal[46]
- *Wood and wood products:* continuously shaped wood, laminated wood panels, plywood, and lumber of red meranti

Figure 12.3 shows the classification of all exports of Sabah and North Kalimantan according to their type of export.[47] The following observations can be made from the results:

(a) Across all product exports, Sabah has the greatest comparative advantage in the production of processed wood products, followed by primary (unprocessed) agricultural products.

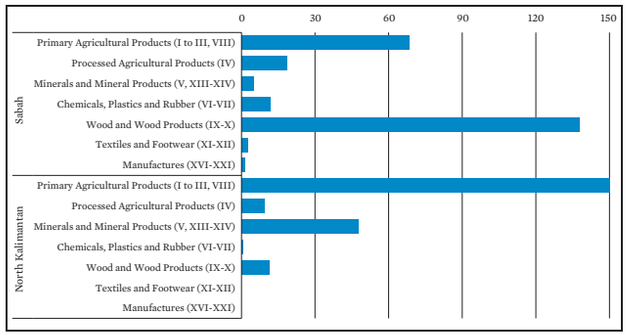
(b) Sabah's exports are also revealed to have a strong comparative advantage in the production of processed agricultural products and rubber goods. Manufactures have a relatively small comparative advantage, suggesting that Sabah has yet to develop technology and human capital or skilled labor intensive industries.

Figure 12.2. North Kalimantan's Revealed Comparative Advantages



Source: Based on data from North Kalimantan customs authority.

Figure 12.3. North Kalimantan and Sabah Revealed Comparative Advantage, by Broad Product Categories



Source: Based on data from North Kalimantan customs authority.

[46] Kalimantan does not have clean coal technology to achieve significant reductions in air emissions.

[47] *Export sophistication*: This indicator classifies all products of each country in Central and South Asia into one of five mutually exclusive technological groupings: high tech, medium tech, low tech, primary products, and resource-based products. The classification is described as follows:

$$100 * \sum_{k \in \Omega_{tec}} \frac{x_{ijk}}{X_{ij}} \quad \forall \text{ for all } tec \in [\text{HT, MT, LT, PP, RB}]$$

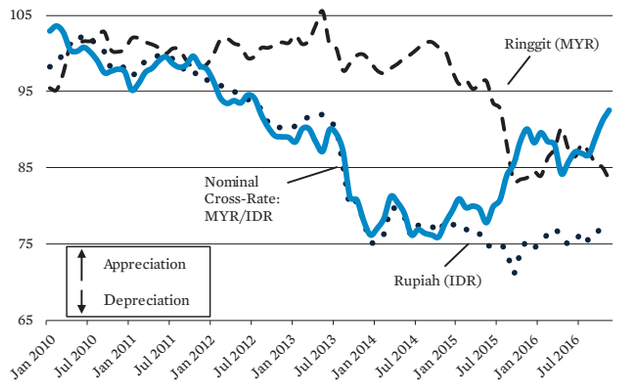
where x is the value of exports of product k from country i to partner j, and X is the total value of all exports of i to j. Ω_{tec} is the set of all products in mutually exclusive categories: high tech (HT), medium tech (MT), low tech (LT), primary products (PP), and resource-based (RB).

(c) North Kalimantan has a strong comparative advantage in the production and export of fishery and mineral (coal) products, as well as wood and processed wood products.

12.2 Competitiveness

One of the major macroeconomic determinants of trade and cross-border investments is international price competitiveness. In the strengths, weaknesses, opportunities, and threats (SWOT) analysis conducted for this study, business leaders often referred to their price competitiveness as a critical factor affecting their ability to compete with Indonesia and other countries. Price competitiveness is measured by the *real exchange rate*, which considers both general price movements in each country relative to that of each trading partners, and the *cross or bilateral exchange rate* between a country and each of its trading partners. When all trading partners are considered, then real bilateral exchange rates are weighted averages of the trading partners in each corresponding year and they measure the *real effective exchange rate*. The *index of competitiveness* is constructed as the inverse of the real bilateral or effective exchange rate.[48]

Figure 12.4. Nominal Exchange Rates of Malaysia and Indonesia



Source: Bank for International Settlements.

We begin by examining movements in the nominal exchange rates of Malaysia and Indonesia, which are often the basis for perceptions about price competitiveness. Since 2010 both the Malaysian ringgit and the Indonesian rupiah have depreciated against the United States dollar, but in 2016 both currencies have stabilized against the dollar, which implies a leveling on of competitiveness changes (Figure 12.4).

These movements, however, obscure cross-rate changes between the two currencies. Because the rupiah fell more than the ringgit against the dollar in the early part of the 2010s, the nominal cross-rate of the ringgit against the rupiah fell sharply during that period.

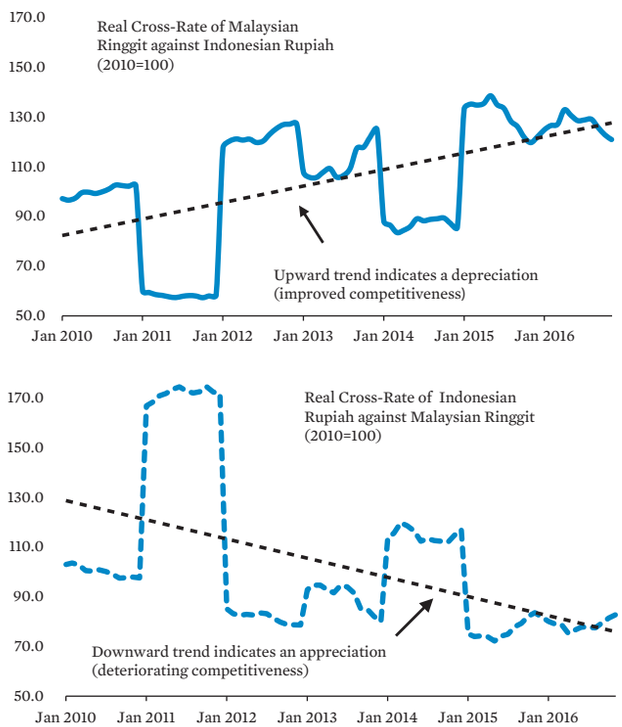
[48] The real exchange rate is the bilateral rate which considers changes in relative price levels between a country and its trading partner. It measures changes in the purchasing power between the domestic and the foreign economy, and it provides an indicator of changes in the international competitiveness of the domestic economy in its ability to purchase more (or less) goods and services per unit of foreign currency. As an extension, the real effective exchange rate measures the average relative strength of the local currency, and it is calculated as the weighted average of real exchange rates, where the weights are the value of imports from and exports to a given partner country *i* divided by total imports and total exports of the home country.

Formally the real effective exchange rate is defined as $e^r_t = [e^n_t(P^f_t/P_t)]$ where e^n is the nominal exchange rate, *Pf* is the foreign currency price of goods purchased abroad, and *P* is the domestic price level. A rise in e^r represents a real *devaluation* in a fixed exchange rate system, and a *depreciation* in a flexible exchange rate system, which can be brought about by either a rise in the nominal exchange rate e^n, or a rise in the relative price of foreign goods (equivalent to a relative fall in the price of domestic goods). Conversely, a fall in e^r represents a real *revaluation* under a fixed exchange rate system, and an *appreciation* under a flexible exchange rate system. The fall is associated with either a drop in the nominal exchange rate e^n or a fall in relative prices of foreign goods (equivalent to a rise in relative prices of domestic goods).

However, since mid-2015, the trend has reversed and the ringgit has risen against the rupiah. The recent movement supports perceptions in the SWOT survey that the ringgit exchange rate against the rupiah has weakened, and that perhaps Malaysia's competitiveness in goods and services against those of Indonesia has deteriorated.

Notwithstanding these nominal exchange rate movements, Malaysia's competitiveness depends not only on relative exchange rate movements, but also relative domestic price movements, that is, inflation. Hence, there exists the need to measure *bilateral real exchange rate* movements. Figure 12.5 shows the results of those calculations in terms of real cross-rate movements of Malaysia in the top half of the graph, and those for Indonesia in the bottom half. Note that the bilateral real exchange rate movements of each country are a mirror image of the other.

Figure 12.5. Real Cross Rates of Malaysia and Indonesia



Source: Calculated by the authors based on data from Bank for International Settlements.

Since 2010, Malaysia's real cross-rate of the ringgit against the rupiah has trended upward, suggesting a real exchange rate depreciation, that is, an improvement in the export competitiveness of Sabah and the rest of Malaysia. In contrast, Indonesia's rupiah has strengthened somewhat against the ringgit in real terms, resulting in a deterioration in North Kalimantan's exports to Sabah and the rest of Malaysia.

It is noteworthy, however, that movements in the bilateral real exchange rate have stabilized in 2016 and this change may signal a change in the medium- to long-term competitiveness of exports from Sabah and North Kalimantan. The new trend appears to have stabilized, with the price competitiveness of their respective exports perhaps remaining unchanged in the near to medium term. Indeed, the International Monetary Fund is projecting relatively similar movements in inflation and the nominal exchange rate between the two countries through the early 2020s.[49]

[49] International Monetary Fund. 2016. World Economic Outlook Database. October. https://www.imf.org/external/pubs/ft/weo/2016/02/weodata/index.aspx.

13

Trade and Investment Potential

13.1 Trade Complementarities

One way to deduce whether there exists potential for large-scale trade between Sabah and North Kalimantan is to examine whether the types of products exported by Sabah are those that are important to North Kalimantan's imports. One method used to measure potential trade is by invoking the Trade Complementarity Index. It measures the extent to which exports of a country are compatible with imports of its trading partners.[50] A high index, one that approaches 100, indicates that two countries have considerable scope for trade expansion, while an index that is near 0 suggests that the two countries lack any opportunity to trade.

Table 13.1 shows the results of this type of analysis:

(a) There is a relatively small demand in North Kalimantan for Sabah's large exports, namely those products produced by the palm oil, wood, and fisheries industries. As a result, the index of trade complementarity is relatively small compared with Sabah's smaller exports.

Table 13.1 Trade Compatibility Indexes for Sabah Exports and North Kalimantan Imports

Size	Index of Trade Complementarity	Example of Exports
Large-sized exports	57.6	Sweet biscuits • frozen fish • herbicides • aerial reflectors • diesel engines • cocoa powder • rice paper • petroleum oils • sugar
Medium-sized exports	82.8	Mattresses • natural cellulose • chocolate • motors and generators • personal computers • parts of hydraulic engines • copper hardware • rice • appliances • rattan furniture
Small-sized exports	95.7	Tricycles • tea • communication apparatus • maize • personal computer parts • parts of iron or steel • asphalt • air pumps • life jackets
Emerging exports	94.5	Ball bearings • wire for welding • locks of base metal • parts of trucks • scrapers • cotton linen • cornstarch • paper towels • cuttings and slips • staple fiber nylon

Note: Large-sized exports (LS) = LS > RM10 million; medium-sized exports (MS): RM1.0 million < MS < RM10 million; small-sized exports (SS): RM0.5 million < SS < RM1.0 million; emerging exports (EM): MS < RM0.5 million.
Source: Compiled by the authors based on their calculations.

[50] The *Trade Complementarity Index* is formally defined as follows:

$$100 * \left[1 - \sum_k \left| \frac{m_{jk}}{M_k} - \frac{x_{ik}}{X_i} \right| /2 \right]$$

where x is the value of exports of product k from reporter country i, and X is country i's total exports. Partner country j's value of imports of product k is given by m, and its total imports value is denoted by M. The range of possible values are 0 to 100, where a score of 100 indicates that the exported products are compatible with imports of trading partners and a score near 0 indicates lack of compatibility. The index of compatibility is usually between 50 and 60 for trade between industrialized countries, and it averages about 20 for trade between developing countries.

(b) There is a high degree of trade complementarity between North Kalimantan's imports and Sabah's exports of its small and emerging exports. While some of these products are reexports of Sabah, it does point to the emergence of industries requiring human capital and skilled labor-intensive activities, as well as technology-intensive methods of production.

Another way of determining potential trade and cross-border investment between Sabah and North Kalimantan is to assume that there are few natural resource and technological differences between countries, and to examine the actual or potential degree of concentration or so-called agglomeration of industries. Traditionally, countries have achieved agglomeration through the activities of large multinational enterprises that concentrate industrial activity in particular locations, thereby allowing some countries to advance more quickly than others. Agglomeration economies are closely associated with economies of scale and network effects of similar businesses acting together to benefit from proximity to upstream and downstream activities, and from technological spillovers of information flows that occur when clustering of production activities. The opportunity to develop cross-border supply and value chains is examined in the next section of this chapter.

13.1 Potential Cross-Border Value Chains

The analysis in this part of the study indicates the existence of three potential cross-border value chains between Sabah and North Kalimantan:

(a) *Palm Oil Industry* – Sabah is Malaysia's largest palm-oil-producing state and, by itself, the state is the world's third largest producer of palm oil. In view of the industry's positive contribution to economic growth, the state government had taken up strategies and programs to attract additional investment in downstream industries. The success of these programs is reflected in new investment that will soon create the world's first palm oil-based biorefinery complex to produce sustainable materials for the manufacture of detergents, lubricants, and plastics. Eastern Sabah has been identified as being an extremely good location for oil palm, particularly in Tawau, Lahad Datu, and Sandakan. Nevertheless, major challenges face the industry, including land scarcity, lack of skilled workers, and insufficient mechanization in the processing of palm oil. Land scarcity means that the available oil palm plantations in the state are almost exhausted. Consequently, the development of a cross-border value chain with North Kalimantan would provide much-needed palm oil.

(b) *Fisheries Industry* – Crustaceans and fish contribute $185,292,941 to Sabah's exports and $28,847,216 to North Kalimantan's exports. That amount represents 1.6% of Sabah's exports and 4.6% of North Kalimantan's exports. The largest portion of foreign exchange earnings in this industry derives from shrimp and prawn exports. Nevertheless, Sabah's $181,288,000 annual imports of crustaceans and fish from North Kalimantan cover a fairly wide range of products, including grouper fry, other fresh fish, baby lobsters, live crabs, crab meat, fresh prawns, dry shrimps, cockles, and dried seaweed from North Kalimantan.[51] There are currently 30 fish processing companies in Sabah state,

[51] Data from Sabah office of the Royal Malaysian Customs Department.

5 of which are in Tawau.[52] Their demand for fish of all types is growing rapidly and North Kalimantan is currently developing both sustainable fish farming and commercial fishing that will provide Sabah's fish processing companies with needed supplies.

(c) *Wood Processing Industry* – The wood-based industry is one of the major revenue contributors to Sabah's economy. Most of the state's wood originates from plantation forests, with the result that Sabah has the lowest proportion of natural forest wood harvesting in Malaysia. The National Timber Industry Policy aims to achieve high export growth of wood products and premium level furniture exports in the medium to long term. In that context, Sabah's development of a cross-border value chain with North Kalimantan could help to bolster its carpentry products and advance the state's premium branded furniture industry.

(d) *Organic Foods Industry* – Organic foods are the fastest growing sector of the food industry worldwide, and organic foods benefit from premium prices that can be 3 to 4 times higher than conventional foods. In both Indonesia and Malaysia, consumption of organic foods is growing rapidly because of health concerns from excessive use of fertilizers in the production of conventional foods. Yet there are large production deficits of organic foods within both Indonesia and Malaysia. In Malaysia, for example, over 60% of organic food products are imported.[53] Both Sabah and North Kalimantan have a large potential for the organic food production, but existing farming practices are fragmented and there is often a lack of awareness of premium markets and distribution mechanisms. Cross-border collaboration in clustering of organic food producers, from both the agricultural and fisheries industries, could lead to scale economies and facilitate access to premium markets.

[52] Department of Fisheries, Sabah.

[53] C. Somasundram, Z. Razali, and V. Santhirasegaram. 2016. A Review on Organic Food Production in Malaysia. *Horticulturae*. 2 (3). p. 12. Kuala Lumpur. http://www.mdpi.com/2311-7524/2/3/12/pdf.

PART VI

Economic Analysis of Traded Services

Summary

The three services industries with potential cross-border trade opportunities between Sabah and North Kalimantan are medical tourism, private technical and vocational education and training (TVET) and higher education, and tourism. Sabah is a provider in all three industries, while North Kalimantan is a potential recipient of the first two and a strong contender for multi-destination tourism partnerships with Sabah, assuming that connectivity improvements occur in the near future.

Medical Tourism: Over 80% of Malaysia's inbound medical travelers are from Indonesia, which places Sabah in a premier location bordering North Kalimantan. Yet the medical tourism industry in Sabah is at its infant stage of development. Many of the private hospitals are new and have not yet received widespread international exposure to potential medical tourists. Nevertheless, they are highly price competitive, contain state-of-the-art medical facilities, and have received both national and international accreditations. There are currently six major international private hospitals in Sabah, most of which are in Kota Kinabalu. In contrast, medical facilities in North Kalimantan offer basic services. There is a total of eight hospitals in the province, the largest of which is RSUD Tarakan. Seven of the hospitals belong to the public sector held, and one is privately owned.

Private Technical and Vocational Education and Training and Higher Education: The Higher Education Blueprint 2015–2020 targets a 2.5-fold increase in TVET enrollment, which represents a major challenge, given the low attraction that TVET programs have, compared with academic degree-based programs. It will require a mindset change, not only for potential students, but also for policy makers to make TVET and academic pathways equally valued. Indeed, there is already a large supply deficit of TVET graduates in Malaysia's 12 national key economic area (NKEA) sectors, which include the palm oil, tourism, financial services, electronics, business services, communications content and infrastructure, education, agriculture, oil and gas, wholesale and retail trade, and health care industries. The blueprint aims to remedy the supply imbalance by working closely with key industries to reduce or eliminate supply deficits, as discussed in detail in Chapter 24.

Multi-Destination Tourism: A North Kalimantan–Sabah arrangement could help stakeholders in both territories to gain a competitive advantage and thus enhance sustainability if they can package and market their various attractions more cohesively to attract visitors. North Kalimantan, as a relatively new province, lacks technical expertise in tourism development, has limited financial resources to promote tourism, and has limited infrastructure outside of Tarakan to support the tourism industry. Likewise, Sabah currently has a very modest visitor advertising and promotion spending state budget of less than RM2,000 per visitor, and needs to increase those expenditures considerably if it is to achieve any acceleration of visitors from its current 5% a year expansion.

14

Medical Tourism

14.1 Sabah's Strategic Plan

14.1.1 Strategy

Malaysia's health care system evolved from a simple single provider system to one of multiple providers that are categorized into public and private sector agents of health care services.[54] Since the Seventh Malaysia Plan (1996–2000), the government has progressively reduced its role in the provision of health services, and increased its regulatory and enforcement functions. To support that movement, the government is promoting the expansion of private health care and hospitals and, under the Eleventh Malaysia Plan (2016–2020), well-being remains a priority thrust for realizing Vision 2020.

In Sabah, the Eleventh Malaysia Plan has articulated the leading role of medical tourism in the state. As the premier ecotourism destination in Malaysia, both the Federal Government and the Sabah State Government want to accelerate investment in private medical facilities and wellness clinics. The state has plans to develop a biotechnology hub at the Kota Kinabalu Industrial Park that will boost the pharmaceutical and medical sector.

Over 80% of Malaysia's inbound medical travelers are from Indonesia, which places Sabah in a premier location bordering that country. High quality care facilities at competitive prices combined with fluent English being spoken everywhere and a large number of tourist attractions have led to the country's high ranking in the global medical tourism industry. Malaysia currently ranks third in global medical tourism destinations and second in Southeast Asia (Tables 14.1 and 14.2). The number of inbound medical travelers in 2015 were twice as large as those of Singapore and significantly over three times as large as those of the Republic of Korea and Taipei,China. Overall, Malaysia's medical cost savings are over twice those of Singapore, 87% higher than in the Republic of Korea, 33% higher than in Taipei,China, and 12% higher than in Thailand (Table 14.2). Only India has greater cost savings than Malaysia.

Table 14.1. Number of Medical Travelers in 2015

Mexico	2,200,000
Thailand	1,550,000
Malaysia	882,000
India	600,000
Turkey	583,000
Singapore	430,000
United States	300,000
Republic of Korea	275,000
Taipei,China	240,000
Brazil	210,000

Source: Information provided to the authors by Patients Beyond Borders. www.patientsbeyondborders.com.

14.1.2 Incentives

Malaysia Health Tourism Council – The main federal government agency tasked with the promotion of medical tourism is Malaysia

[54] For details, see Malaysia Productivity Corporation (MPC). 2016. *Reducing Unnecessary Regulatory Burden on Business: Medical Professional*. Kuala Lumpur.

Table 14.2. Malaysia's Average Savings on Medical Procedures Over Competitors, 2015

Singapore	115%
Republic of Korea	87%
Mexico	40%
Taipei,China	33%
Costa Rica	27%
Thailand	12%
India	–13%

Source: Information provided to the authors by Patients Beyond Borders. www.patientsbeyondborders.com.

Health Tourism Council (MHTC), under the Ministry of Health. The MHTC, a one-stop center for the health care travel industry to promote and develop private facilities, facilitates networking, regulates activities, and disseminates information on medical tourism in the country. It focuses its work on private health care institutions and offers them international marketing programs and special tax incentives that include income tax exemption on as much as 100% of qualifying expenditures for improving health care travel infrastructure. There are two types of MHTC membership: (i) ordinary membership to hospitals that meet standards of service and quality medical care for hospitals and have at least one accreditation from international health care accreditation bodies; and (ii) elite partner membership for private health care institutions accredited by international health care accreditation agencies, such as the Joint Commission International, Malaysian Society for Quality in Health, the Australian Council on Healthcare Standards, Accreditations Canada, and the United Kingdom's Comparative Health Knowledge System Accreditation Unit. Elite Partners benefit from more targeted MHTC promotions. Membership fees are RM3,000 to RM5,000 for ordinary membership and RM20,000 for elite partner membership. To be eligible for membership, foreign patients must represent at least 5% of a hospital's annual patient intake. At present, there are three hospitals in Sabah that have ordinary membership (Gleneagles Kota Kinabalu, KPJ Damai Specialist Hospital, and KPJ Sabah Specialist Hospital), while none have elite partner membership.

Malaysian Investment Development Authority – The Malaysian Investment Development Authority offers tax incentives for the promotion of health care travel in two areas: (a) new private health care facilities; and (b) expansion, modernization, and refurbishment of existing private health care facilities. Private hospitals or ambulatory care centers are eligible to apply for income tax exemption equivalent to the investment tax allowance of 100% on the qualifying capital expenditure incurred within a period of 5 years. The allowance can be used to offset against 100% of the statutory income for each year of assessment. Any unutilized allowance can be carried forward to subsequent years until fully utilized. For a private health care institution to be eligible for the incentive, health care travelers must represent (i) at least 5% of total patients for each year of assessment; and (ii) at least 5% of gross income for each year of assessment. Health care travelers are defined as either non-Malaysian citizens who participate in the Malaysia My Second Home Program as expatriates who are non-Malaysian citizens holding a Malaysian work permit and their dependents; or non-Malaysian citizens who visit and receive treatment from private health care facilities in Malaysia. In addition to the investment tax allowance, health care facilities are eligible for double tax deductions by the Ministry of Finance for accreditation if they are accredited in one or more of the following: (i) Malaysian Society for Quality in Health, (ii) Joint Commission International, (iii) Accreditation Canada International, (iv) Australian Council on Healthcare Standards, and (v) the United Kingdom's Comparative Health Knowledge System.

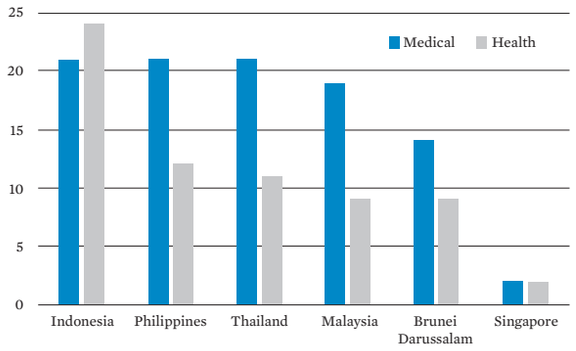
Sabah Tourism Board – The Sabah Tourism Board has been operating since 2009 to promote Malaysia as a preferred health care center through exhibits and conferences both overseas and within the country. Its objective is to coordinate stakeholders along the medical tourism value chain, including hospitals, hotels, travel agents, and airlines. In Sabah, it has initiated some medical tourism efforts with Gleneagles Kota Kinabalu Hospital, a newly built hospital

in central Kota Kinabalu offering a range of health care services. The Sabah Tourism Board is also beginning to work with Jesselton Medical Centre and KPJ Sabah in Kota Kinabalu. The plan is to contract agents in North Kalimantan as well as in Jakarta, Bandung, and Surabaya in Indonesia who could promote medical tourism package services in Sabah's medical centers to affluent families in those locations.

14.1.3 Regulations

Malaysia's policies on trade in medical services remain relatively restrictive, while those in health services are more open. Medical services cover professional services of doctors, dentists, nurses, and other paramedics, while health services cover hospitals, medical laboratories, and ambulance services. In medical services trade, Malaysia's degree of policy restrictiveness nearly matches those of Indonesia, the Philippines, and Thailand (Figure 14.1). In health services trade, Malaysia's trade restrictiveness is in line with Brunei Darussalam and considerably below that of Indonesia, the Philippines, and Thailand.[55]

Figure 14.1. Trade Restrictiveness in Medical and Health Services



Note: Data for 2014.
Source: P. Dee. 2015. Monitoring the Implementation of Services Trade Reform towards an ASEAN Economic Community. ERIA Discussion Paper Series. ERIA-DP-2015-44. Jakarta: ERIA.

Malaysia's restrictiveness rankings in both types of services have improved considerably. A decade ago, Malaysia was the second highest ranking country in trade restrictiveness in medical services among all Association of Southeast Asian Nations (ASEAN) member countries, with only Myanmar having a higher level of restrictiveness.[56] Under the ASEAN Framework Agreement on Services, Malaysia's commitment on medical services cover only dentists. Individual foreign doctors can practice in the country, contingent on passing an English language competency exam, but there are several restrictions on their activities. In health services, there are few commitments.

14.2 Sabah's Emerging Competitiveness

The medical tourism industry in Sabah is at its infant stage of development. Many of the private hospitals are new and have not yet received widespread international exposure to potential medical tourists. Yet they are highly price competitive, contain state-of-the-art medical facilities, and have received both national and international accreditations (Figure 14.2). Hospitals that are part of conglomerates with facilities elsewhere have established reputations, and all hospitals in Sabah have a competitive cost advantage regionally and globally. Medical costs in Sabah are like the rest of Malaysia, and Malaysia's medical costs are as much as 23% below those in Thailand, 44% below those

[55] For details, see P. Dee. 2015. Monitoring the Implementation of Services Trade Reform towards an ASEAN Economic Community. ERIA Discussion Paper Series. ERIA-DP-2015-44. Jakarta: ERIA.

[56] J. Corbett and S. Umezaki. Overview: *Deepening East Asian Economic Integration. In J. Corbett and S. Umezaki, eds. Deepening East Asian Economic Integration.* ERIA Research Project Report 2008, No. 1. Jakarta: ERIA.

Figure 14.2. Sabah's Medical Tourism Competitiveness

Advantages

- Private sector investment in health care
- National and international accreditation and quality assurance
- Potential for cost savings on medical procedures
- Excellent tourism infrastructure
- Sustained reputation for clinical excellence
- State-of-the-art medical technology

Disadvantages

- International patient flow remains low
- Security concerns over the continued abductions
- Availability of internationally trained specialized medical staff
- Undeveloped integrated value-chain medical tourism
- Limited awareness about medical facilities
- Competition of other medical centers

Source: Compiled by the authors based on replies to a structured questionnaire for all hospitals.

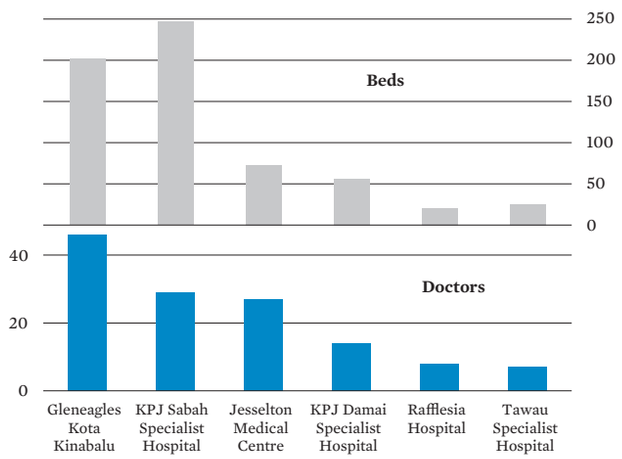
of Taipei,China, 54% below those of the Republic of Korea, and 62% below those of Singapore.[57]

As an infant industry, however, Sabah's medical tourism has not yet reached the takeoff stage of development. International patient arrivals remain low and many are currently either tourists that need medical attention or residents under the Malaysia My Second Home program. Within the industry, there is an insufficient number of specialized doctors, either because public hospitals in Sabah offer higher salaries to attract the limited number of specialists or because of regulatory restrictions on the entry of doctors from outside Sabah state. Outside the industry, there remain security concerns over possible abductions, especially in the eastern coast of the state.

14.2 Stocktaking Sabah's Medical Facilities

14.2.1 Size and Composition

Figure 14.3. Number of Doctors and Beds in Sabah's International Hospitals



Source: Compiled by the authors.

There are currently six major international private hospitals in Sabah, most of which are in Kota Kinabalu. Figure 14.3 shows their size in terms of number of doctors and beds in each institution. Gleneagles dominates Sabah hospitals in terms of number of doctors. Gleneagles and KPJ Sabah Specialists are the largest hospitals when measured by number of beds. They are also the newest hospitals and have the largest number of nurses and administrative staff, accounting for nearly 60% of all medical staff in Sabah's six major international private hospitals. Jesselton Medical Center, the third largest hospital, was established in 2009 and has the largest share of international patients. Tawau hospital is currently limited to 7 doctors and 54 nurses and adminstrative staff, but it plans to expand facilities in the future to have fully equipped outpatient clinic facility, in-patient ward facility, medical laboratory services, and a full radiology department.

[57] Patients Beyond Borders. Medical Tourism Statistics and Fact. http://www.patientsbeyondborders. com/medical-tourism-statistics-facts (accessed 14 December 2016).

14.2.1 Hospital Profiles

Gleneagles Kota Kinabalu – Gleneagles Kota Kinabalu was inaugurated in 2015 (Figure 14.4). It is a joint venture between Riverson Corporation Sdn Bhd, Sabah government's investment arm, Warisan Harta Sabah Sdn Bhd, and Sahamurni Sdn Bhd. It aims to become the leading East Malaysia medical center for international patients from Indonesia, Brunei Darussalam, the Republic of Korea, and Japan.

Figure 14.4. Gleneagles Kota Kinabalu Medical Centre

Source: Photo provided by Gleneagles Kota Kinabalu Medical Centre.

There are three centers of excellence: (i) the advanced cardiovascular center equipped with the latest technology and equipment for investigative and surgical procedures that tailors to the needs of patients and their families; (ii) the hospital's team of specialized orthopedic surgeons, nurses, physiotherapists, and occupational therapists to provide patients with therapy and interventions to overcome their bone and joint problems; and (iii) a multidisciplinary team that is supported by qualified nurses trained in neonatal intensive care, midwifery and lactation, and pediatric and gynecology. Currently, about 10% of Gleneagles' patients are international clients and the hospital offers a comprehensive program to facilitate their visits, including (i) translators for foreign languages; (ii) estimated bill at the time of admission to aid in financial planning; (iii) hotel or apartment accommodation bookings and confirmation; (iv) flight bookings, airport transfer arrangement; (v) third party arrangement and insurance assistance; (vi) assistance for visa application and travel arrangement; and (vii) post-treatment tour and sightseeing arrangement.

KPJ Sabah Specialist Hospital – The KPJ Sabah Specialist Hospital began operation in 2013 with 245 beds and state-of-the-art health care facilities (Figure 14.5). It offers comprehensive outpatient and inpatient specialist health care services, ranging from prevention, diagnosis, and intervention and treatment of wide range of diseases and medical conditions. It has a team of over 350 health care employees and doctors offering a range of medical specialist services. It is a member of the MHTC and is actively involved in medical tourism. It provides comprehensive patient care for a broad spectrum of disease conditions, early diagnosis and appropriate treatment, and health care and fitness centers. In medical tourism, it targets cosmetic and plastic surgery, skin tightening, liposuction,

Figure 14.5. KPJ Sabah Specialist Hospital

Source: Photo by the authors.

dental whitening, and Lasik surgery. Its wellness packages cover women screening; executive health screening; senior health screening; bio-markers C12 cancer screening; and heart, stroke, cancer health screening. Hospital staff are English speaking, costs are highly competitive, medical specialists are highly trained, and there are major tourist attractions after medical procedures have been completed.

Figure 14.6. Jesselton Medical Centre

Source: Photo provided by the hospital.

Jesselton Medical Centre – Jesselton Medical Centre was initially established as a maternity and child hospital in 2009 and, in 2011, its services expanded into a "one-stop" tertiary center with international standards (Figure 14.6). It has 23 consultant rooms, 72 beds of which 59 beds are in 16 single rooms and 21 double rooms, 6 intensive care beds, and 7 delivery suites. It has 3 operating theaters, a radiology department with 1.5 Tesla MRI, 640-slice CT scan, fluoroscopy, standard x-ray, digital mammography, densitometry, ultrasound scan, physiotherapy, pharmacy, laboratory, and a 24-hour emergency and trauma department. Jesselton Medical Centre specialists are well-trained and have many years of experience. Jesselton Medical Centre can provide treatment for medical tourists. It has an ideal environment for tourists with Avangio Hotel, a 5-star hotel adjacent to the hospital. Jesselton Medical Centre plans to become a member of Malaysia Healthcare Travel Council to promote its services to tourists who want medical treatment as well as an opportunity to visit Sabah's natural attractions.

Figure 14.7. KPJ Damai Specialist Hospital

Source: Photo by the authors.

KPJ Damai Specialist Hospital – Damai Specialist Hospital was established in 1990 (Figure 14.7). It is a four-story building near Damai Commercial Centre and about 6 kilometers from Kota Kinabalu city center. In November 2005, the hospital was taken over by KPJ Healthcare Berhad, a publicly listed company that is part of the KPJ Healthcare Group. In 2008, it added a hospital wing while later renovating the original part of the hospital. The hospital expansion project provided new outpatient clinics, two operation theaters, new diagnostic imaging services, and 56 patient beds. It has state-of-the-art equipment to perform MRIs, CT scans, and mammograms. The hospital has upgraded its facilities to include an accident and emergency unit, an intensive care unit, a hemodialysis unit, and two new delivery suites.

Tawau Specialist Hospital – Tawau Specialist Hospital has 25 beds and 7 doctors, plus 21 nurses and administrative staff (Figure 14.8). Nearly 3,000 patients are treated each year, of which almost 30% are foreigners. The hospital plans to expand its facilities considerably to become a premier inpatient and specialist outpatient health care center with state-of-the-art radiological and investigative medical laboratory testing equipment. The hospital will have 122 beds and 10 consultation rooms with full medical laboratory backup services as well as x-rays and an MRI setup. The expanded facilities is expected to attract more patients, leading to a 15%–20% annual growth in clients following the expansion. As the only specialized private hospital in southeast Sabah, the administration plans to work closely with doctors in Indonesia and southern Philippines and, at the same time, connect with medical centers in Singapore, Australia, and the United States.

Figure 14.8. Tawau Specialist Hospital

Source: Photo provided by Tawau Specialist Hospital.

14.3 Stocktaking North Kalimantan's Medical Facilities

Medical facilities in North Kalimantan offer basic services. Of the eight hospitals in the province, seven are publicly owned and RSIA Pertamedika is privately owned; three hospitals are located in Tarakan island, and RSUD Tarakan is the largest.[58] Table 14.3 lists the hospitals and their sizes, based on the number of doctors and nurses.

Table 14.3. North Kalimantan Hospitals

Hospital	Doctors				Nurses		
	Total	General Practitioners	Specialists	Dentists	Total	Midwives	Nurses
RSUD Dr. H. Soemarno Sostro Atmodjo	12		12		47	47	
RSUD Kabupaten Malinau	35	25	10		0		
RS Bergerak Langap Kab. Malinau	0				6	6	
RSUD Kabupaten Nunukan	41	28	6	7	46	46	
RSUD Akhmad Berahim KTT	13	13			166	62	104
RSUD Tarakan	118	72	9	26	323	34	289
RSAL Ilyas Tarakan	4		4		5	5	
RSIA Pertamedika Tarakan	14	12	2		54		54
Total	237	150	43	33	647	200	447

Note: RSUD (Rumah Sakit Umum Daerah) refers to regional public hospital.
Source: Government of North Kalimantan. 2016. Brief Profile of Kalimantan Utara. Tanjung Selor, North Kalimantan.

[58] RSUD (Rumah Sakit Umum Daerah) refers to regional public hospital.

Government regulations require interns to spend 1 year in a remote area. Since North Kalimantan is considered a remote area, it benefits from those internships. However, provincial hospitals lack specialists and up-to-date equipment. For advanced specialized treatment, most people with the financial means travel to see specialists in either the large urban centers of Indonesia or to hospitals in Penang, Malaysia.

Figure 14.9. Pertamedika Tarakan Hospital

Source: Photo provided by Pertamedika Tarakan Hospital.

Figure 14.10. RSUD Tarakan Hospital

Source: Photo by the authors.

RSIA Pertamedika – The hospital is wholly owned by the Pertamina Group, which also has nine hospitals throughout Indonesia, the largest of which are in Jakarta and Balikpapan (Figure 14.9). Pertamedika Tarakan has been in operation since 2006 and it has a total of 40 beds. Of the 100 persons employed by the hospital, 54 are nurses. Specializations include ears, nose, and throat; dentists; surgeons; pediatricians; orthopedic doctors; and skin and aesthetic specialists. The hospital is expanding its facilities to accommodate over twice its existing capacity.

RSUD Tarakan – RSUD Tarakan is the largest hospital in North Kalimantan (Figure 14.10). Established in 2003, the hospital opened its current building facilities in 2013. Of its 42 doctors, 26 are general practitioners and 13 are specialists. Of its 1,000 employees, 323 are nurses. In 2016, the hospital treated 21,308 patients. At present, the institution provides limited services, but plans to open a cardiology department. Specialized needs are referred to hospitals within its network in Balikpapan, Jakarta, and Surabaya. About 80% of its patients are covered by the national insurance scheme, and the remaining 20% are covered by private insurance.

14.4 SWOT Analysis

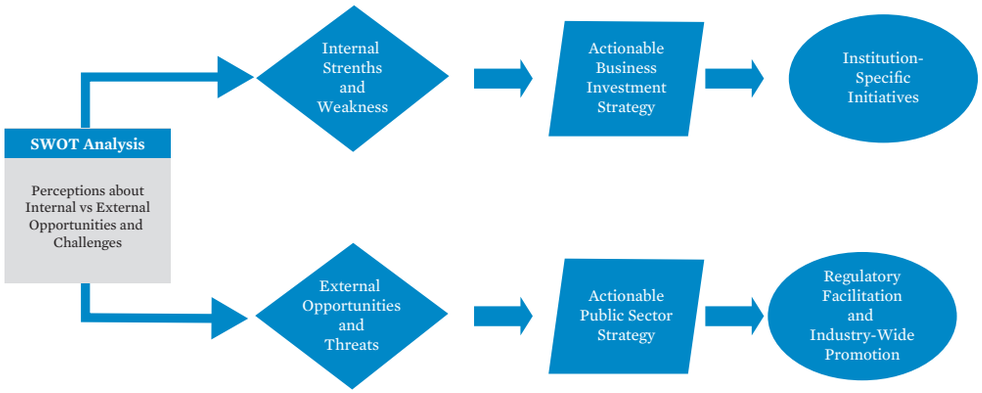
This section reports on the results of a survey of the five leading international private hospitals in Sabah State.[59] The survey was conducted on 21–25 November 2016 and consisted of a questionnaire with 46 structured questions and 1 open-ended question. The structured questions were based on a Likert scale in which respondents specify their level of agreement

[59] A sixth hospital, Rafflesia Medical Centre, declined to provide any information about their facilities and is therefore excluded from the SWOT analysis.

or disagreement on a symmetric agree–disagree scale ranging from 1 (strongly disagree) to 5 (strongly agree) for the series of statements. Thus, the range captures the intensity of their feelings for the given items.

Figure 14.11 shows the methodology for the SWOT analysis. It separates the internal strengths and weaknesses, which are largely controlled by the medical tourism industry, from the external opportunities and threats, which are outside of the medical tourism industry's control. The findings for internal strengths and weaknesses of the industry can lead to actionable business initiatives to enhance strengths and remedy weaknesses. For the external opportunities and threats, it is largely the public sector that can help to further develop opportunities and eliminate or reduce threats. These actions take the form of facilitating the regulatory environment and helping to promote medical tourism in Sabah.

Figure 14.11. Methodology for SWOT Analysis



SWOT = strengths, weaknesses, opportunities, and threats.
Source: Elaborated by the authors.

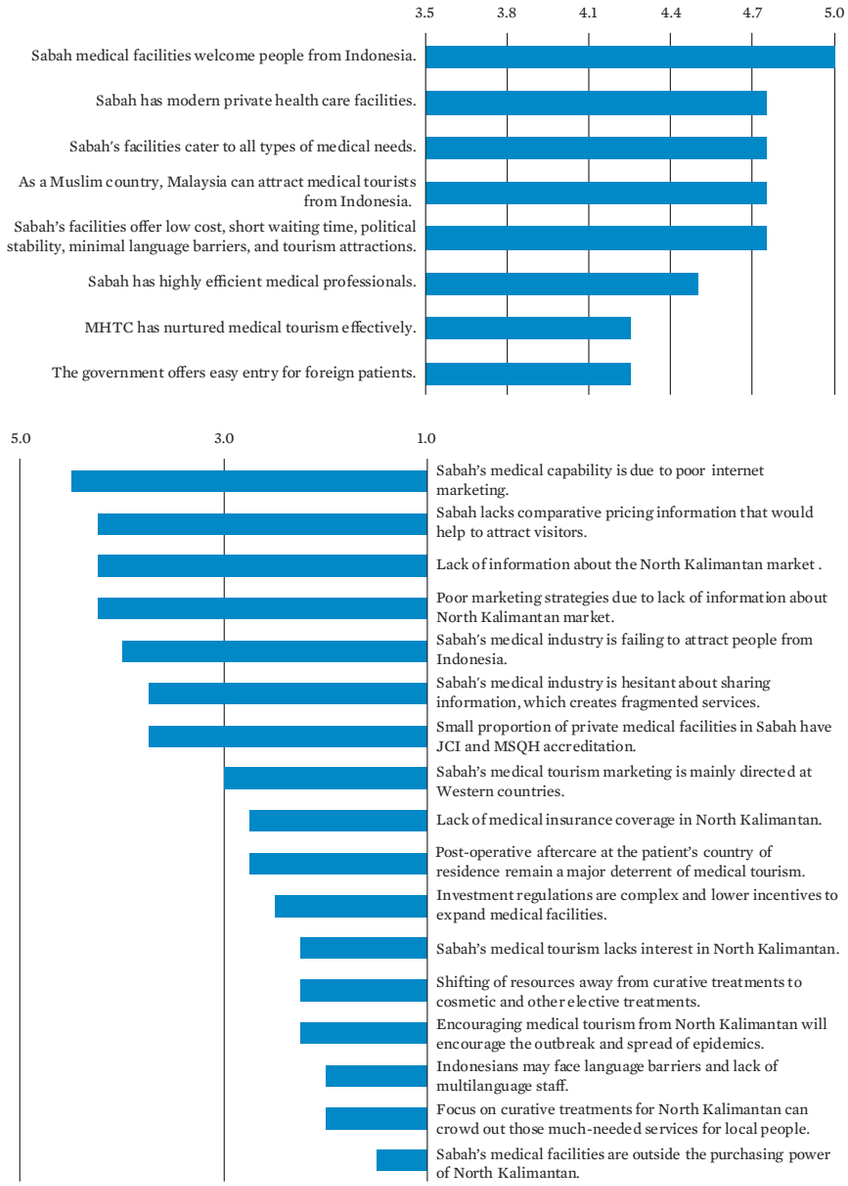
14.4.1 Internal Strengths and Challenges

Hospital administrators in Sabah are generally optimistic about the prospects for expanding medical tourism in the state. The top half of Figure 14.12 shows that hospitals are open to and encouraging in accepting foreign patients, and administrators believe that, generally, their hospitals have a comparative advantage in attracting patients from North Kalimantan and Indonesia because of religious and language similarities, as well as the ability of their hospitals to cater to a wide range of medical needs. Moreover, medical treatment costs are low relative to other countries in the region, a fact confirmed by the evidence presented earlier.

Sabah's private hospitals still have a number weaknesses that prevents them from attracting medical tourism:

- Poor internet marketing is one of the major shortcomings of the hospitals. A comprehensive survey of Malaysia's private hospital websites promoting medical tourism points to the need for hospital managers to improve their hospitals' online

Figure 14.12. Internal Strengths and Weaknesses of Sabah's Medical Tourism Industry



JCI = Joint Commission International, MHTC = Malaysia Health Tourism Council, MSQH = Malaysian Society for Quality in Health.
Source: Based on interviews conducted on 21–25 November 2016.

presence and interactivity.[60] The survey, which included the Gleneagles and KPJ chains with presence in Sabah, found several website characteristics where Malaysian hospitals could benefit from emulating those of Thai and Indian hospitals:

[60] S. Moghavvemi et al. 2016. Connecting with Prospective Medical Tourists Online: A Cross-Sectional Analysis of Private Hospital Websites Promoting Medical Tourism in India, Malaysia and Thailand. *Tourism Management*. Elsevier Ltd.

- Hospital websites in other countries like India are more structured than those in Sabah and ensure general users' greater ease in reading content and structural elements like a site map;
- Sabah's hospital websites lack a range of photos and videos as well as testimonials which other hospitals in countries like Thailand and India include in their websites;
- Although English is widely spoken in Sabah, hospitals in countries like India are nearly twice as likely to mention that they provide in-hospital interpreter services than their Sabah counterparts;
- In costs, hospitals in other countries are far more explicit about estimated medical and hospital fees than Sabah hospitals, and other hospitals publish information about exchange rates more often than Sabah hospitals;
- Indian and Thai hospitals provide interactive tools for online enquiries on their websites, while their Sabah counterparts do not;
- Hospitals in other countries are more likely to provide pre-admission internet-based consultations than Sabah hospitals;
- Thai hospitals are more likely than Sabah hospitals to provide patients with their medical records via internet;
- Indian hospitals are far more likely to specify their health care joint ventures, international affiliations, and overseas referral networks with other hospitals than their Sabah counterparts; and
- Linguistically, Thai hospital websites are nearly three times more likely than their Sabah counterparts to make alternative language options (besides English) available for the website.

One of the difficulties that Sabah private hospitals face when marketing their services is lack of information about foreign markets like North Kalimantan. Inadequate information prevents hospitals from being able to target their marketing efforts to the needs of nearby markets. While some hospitals use foreign agents to find clients, there has been limited success in the achievements to date. In part, the difficulty arises from the lack of coordination among hospitals in using foreign agents and marketing their services abroad. Fragmentation of marketing and promotional materials is expensive, especially when markets are spread over large areas in a country like Indonesia. For instance, one hospital has agents in Jakarta, Belmopan, and a few other provincial capitals, but so far agents have only signed up one or two clients for their hospitals.

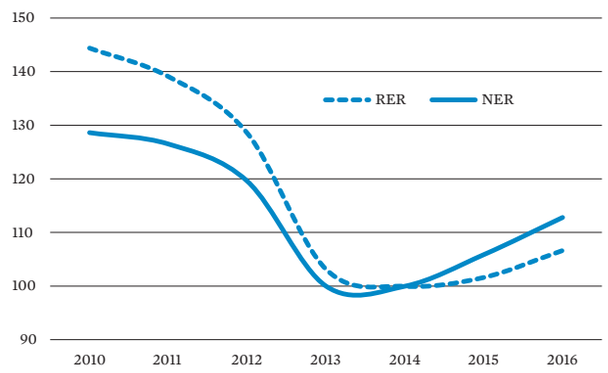
These marketing problems are compounded by the hospitals' unwillingness to share information and the absence of public institution efforts to market Sabah as a medical tourism destination. Despite the Sabah Tourism Board's interest to promote medical tourism, lack of funding and recent cutbacks in their budget prevent it from organizing any sort of marketing campaign. Moreover, the Malaysia Healthcare Travel Council has successfully promoted Malaysia's medical tourism in general, but has no campaign to promote Sabah's medical tourism. As a result, medical centers in Kuala Lumpur, Penang, and Malacca tend to attract most foreign visitors seeking medical treatment.

In contrast, Sabah's private hospitals consider their services to be well within the purchasing power of North Kalimantan people seeking medical treatment. They also believe that they provide services to both local and foreign patients equally well, and that more foreign patients will not undermine their ability to effectively treat the local population. Moreover, while

cosmetic and other elective treatments are gaining in importance among the services offered by the hospitals, these services do not impair their ability to provide curative medical services.

14.4.2 External Opportunities and Vulnerabilities

Figure 14.13. Nominal and Real Bilateral Exchange Rate Indexes of the Malaysian Ringgit and Indonesian Rupiah, 2014=100



NER = nominal exchange rate, RER = real exchange rate.
Source: Calculated from International Monetary Fund data.

Hospital administrators strongly believe that there is an urgent need for private medical hospitals in Sabah to develop an integrated medical tourism system with connectivity, hotel facilities, tourism packages, and follow-up care services (Figure 14.13). At present, individual hospitals are attempting to fully develop their value chains within the confines of individual packages. A fully integrated medical tourism system for all private hospitals could create economies of scale, reduce costs, and lead to increased competitiveness of Sabah's industry as whole.

North Kalimantan is viewed as an important market for Sabah. Its rapidly growing population and proximity to Sabah, along with limited medical facilities, means that people from that province will look to Sabah's medical facilities for treatment. Integrating medical coverage into insurance programs in the province would greatly enhance people's access to Sabah's medical facilities. Development of the new road linking North Kalimantan to Sabah will also facilitate connectivity.

More generally, hospital administrators view the aging population of Southeast Asia and the world as an opportunity to develop affordable and high-quality long-term health care for the aged. Cost and access to care are most commonly cited among the nation's top health care concerns in the more advanced countries and people are therefore turning to medical tourism as means of receiving long-term health care at affordable costs. Investment in health care facilities that cater to diverse senior patient populations requires different types of facilities and services from those provided for short-term medical tourists. Development of these types of facilities will require concerted efforts on the part of all private hospitals to develop a master plan for the industry.

Among the top threats to the development of Sabah's medical tourism are insufficient connectivity to sustain travel to Sabah's medical centers, currency realignments that undermine Sabah's medical cost advantages over neighboring countries, especially considering the intensive competition in the industry by neighboring countries and across Malaysian states, and bureaucratic and administrative obstacles to doing business in the industry. Currency realignments between Sabah and Indonesia could undermine Sabah's ability to attract medical tourists from North Kalimantan. In fact, however, both the nominal and real bilateral exchange rate between the Malaysian ringgit and the Indonesian rupiah has only risen (appreciated) moderately since 2014, following a sharp decline (depreciation) in the bilateral exchange rate from 2010 to 2014 (Figure 14.14). Perceptions therefore exceed the reality of the current situation.

Figure 14.14. External Opportunities and Threats to Sabah's Medical Tourism Industry

ASEAN = Association of Southeast Asian Nations.
Source: Based on interviews conducted on 21–25 November 2016.

15

Higher Education and TVET

15.1 Sabah's New Knowledge Center

Sabah's higher education system policy is molded by Malaysia's overall strategic framework. That framework is presently reflected in, and defined by, the 2016–2020 Eleventh Malaysia Plan (2016–2020), which lays out the direction and strategy for the 5-year plan to transform Malaysia's educational system. Responsibility for implementation of that strategy rests with the Ministry of Higher Education. Within that ministry, the Private Education Division is tasked with promoting Malaysia as a center of educational excellence in Southeast Asia.[61] Table 15.1 summarizes the major initiatives of the Eleventh Malaysia Plan 2016–2020 and the major issues it seeks to overcome in both higher education degree-based programs and technical and vocational education and training (TVET). The Government of Malaysia's commitment to higher education excellence is reflected in the fact that the country is one of the top two countries devoting financial resources to the sector, relative to its gross domestic product (GDP) level.[62]

Malaysia's Higher Education Blueprint 2015–2020 (Higher Education) has, as one of its three guiding principles, the establishment of quality-based higher education that is needed to attract international students.[63] The blueprint establishes a target goal of 250,000 international students in higher-education institutions by 2025, 2.3 times greater than the 108,000 international students registered in 2015.

15.1.1 Internationalization of Higher Education

Internationalization of Malaysia's higher education has been a long-term process that began 2 decades ago under the National Higher Education Strategic Plan 2020.[64] The plan's vision is to make the country an education hub in the region. Implementation has consisted of four phases (Phase 1: 2007–2010, Phase 2: 2010–2015, Phase 3: 2016–2020, and Phase 4: 2020 onward). Phase 3 involves the consolidation of efforts to establish Malaysia as an international hub of excellence for higher education, while Phase 4 involves the sustainability of the country's regional prominence beyond 2020.

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[61] Higher education refers to formal learning that occurs after completion of secondary education and covers general academic education that awards academic degrees and vocational training that awards professional certifications. Source: Wikipedia. Higher Education. https://en.wikipedia.org/wiki/Higher_education.

[62] Universitas 21. 2016. U21 Ranking of National Higher Education Systems. Melbourne Institute of Applied Economic and Social Research, University of Melbourne. http://www.universitas21.com/RelatedFile /Download/762.

[63] Ministry of Education Malaysia. Malaysia Education Blueprint 2015–2020 (Higher Education). https://myquest.mohe.gov.myevent/docs/3.%20Malaysia%20Education%20Blueprint%202015-2025%20 (Higher%20 Education).pdf.

[64] Study Malaysia. 2015. Higher Education in Malaysia, The National Education System. 14 March. https://www.studymalaysia.com/education/higher-education-in-malaysia/the-malaysian-higher-education-system-an-overview.

Malaysia's international student enrollment in higher education is expanding rapidly, averaging 16% a year in the last 10 years.[65] According to the United Nations Educational, Scientific and Cultural Organization, the primary reasons for Malaysia's attraction of international students are the quality of higher education, costs, use of English, quality of life, and cultural comfort. The Global Competitiveness Report ranks Malaysia 12th in terms of perceptions about the quality of the educational system; while, according to QS World University Rankings, the country ranks 27th on the basis of a combination of the education system, flagship institutions, access to education, and funding.[66] International students account for 7.4% of all higher-education students in the country and, within that group, Indonesian students are the second largest foreign nationality after Bangladeshi students.[67]

15.1.2 Academic Degree Programs

In higher education, the Eleventh Malaysia Plan 2016–2020 has three overarching goals: (a) enhance program effectiveness and student quality, (b) strengthen research and innovation, and (c) attain excellence in higher-education institutions. Among the initiatives that are particularly relevant to Sabah's educational system are (i) industry involvement in curriculum designs, (ii) massive open online courses, (iii) English proficiency, and (iv) practical business entrepreneurship and business skills.

The principal aim of the industry's involvement in curriculum design is to move education away from general topics that have little, if any, application to practical activities to areas that are more relevant to the development of the country's high-value industries. In so doing, the new educational system seeks to move away from excessive focus on general business programs to more concrete areas of applied research, science, and engineering.

Virtual learning environment and networking developed within higher education institutions have become a worldwide phenomenon. Yet, in Malaysia, its application is limited and, in Sabah, it is virtually nonexistent. The two main channels for virtual learning environment is internal networking for students physically located in the higher learning institutions, and e-learning material directed at students that are physically located outside the campus and may not even be registered with the higher learning institution. The first channel provides course materials, schedules, lecture notes, discussion forums, self-assessment modules, and examination materials to students enrolled in programs. In contrast, the second channel offers virtual leaning facilities to individuals who are outside the campus, and it includes distance education. The major components are access to learning resources, personalization of learning experiences, progress tracking, and communication and collaboration with instructors. As one of the most dynamic growth areas in education, virtual learning environment offers enormous expansion opportunities for higher education and the establishment of learning hubs within regions.

The primary objective of these initiatives is to raise Malaysia's graduate employability to 80% by 2020 in an effort to lower the currently high 31% rate of unemployment among

[65] *The Sun Daily*. 2015. Malaysia has one of highest proportions of international students pursuing higher education. 29 January. http://www.thesundaily.my/news/1314991.

[66] World Economic Forum. The Global Competitiveness Report, 2016–2017. https://www.weforum .org/reports/the-global-competitiveness-report-2016-2017-1; and QS World University Rankings. University Rankings by Country. https://www.topuniversities.com/system-strength-rankings/2016.

[67] UNESCO. Global Flow of Tertiary-Level Students. http://uis.unesco.org/en/uis-student-flow.

Table 15.1. 2016–2020 Eleventh Malaysia Plan to Transform the Education System

Problems	Solutions Offered by 2016–2020 Eleventh Malaysia Plan	
	Academic Degree Programs	Technical Training (TVET)
1 31% unemployment among higher-education graduates	1 Industry involvement in curriculum design	1 Mainstream TVET and make it commensurable to academic degree programs
2 One-third of unemployed are recent higher-education graduates	2 English proficiency greatly enhanced and broadened	2 Greatly expand number of TVET institutions and capacity of existing ones
3 Excessive general business programs lacking practical knowledge	3 Open online courses, or e-learning, promulgated	3 Promote TVET specialization in leading industries
4 Graduates have poor command of English language	4 Online networking and virtual learning environment in academic institutions	4 Establish common rating system for public–private TVETs
5 Graduates have poor communication and networking competence	5 Industry involvement in curriculum design	5 Implement single qualification system and expedite program approvals
6 Graduates lack skills relevant to leading industries	6 Practical skills in business, industries, and communication integrated into all courses	6 English proficiency greatly enhanced and broadened
7 TVET has unfavorable image	7 Entrepreneurship and innovation skills promoted to support emerging industries	7 Greatly expand TVET intake by 2020, including international students
8 Lack of TVET opportunities for international students		
9 Limited TVET programs supporting leading industries		

STVET = technical and vocational education and training.
Source: Elaborated by the authors.

recent graduates who make up over one-third of all unemployment in the country. The largest proportion of these unemployed graduates are from arts and social sciences (43% unemployment), while those from the pure sciences are less than half that rate. Among the most important reasons for graduate unemployment are (i) poor command of the English language, (ii) poor communication skills, (iii) unrealistic salary expectations, and (iv) lack of skills relevant to Malaysia's industries.[68] Lack of relevant skills is particularly apparent in the country's leading industries, namely, manufacturing, logistics, financial services, information and communication technology, construction, and wholesale and retail trade.

15.1.3 Focus on Technical and Vocational Education and Training

The Eleventh Malaysia Plan 2016–2020 gives priority to the enablement of industry-led technical and vocational education and training.[69] It has two objectives: first, it seeks to mainstream TVET in such a way as to be held in as high regard as higher-education academic

[68] EduAdvisor.my. 2016. What You Didn't Know About Fresh Graduate Unemployment in Malaysia. 19 January. https://eduadvisor.my/articles/what-didnt-know-fresh-graduate-unemployment-malaysia-infographic/.
[69] Prime Minister's Department, Economic Planning Unit. 2015. *Eleventh Malaysia Plan, 2016–2020*. Putrajaya. http://www.epu.gov.my/en/rmk/eleventh-malaysia-plan-2016-2020.

degree programs; and, second, it aims to enlarge student access to vocational training by expanding the number of TVET institutions and increasing the capacity of existing ones. The goal is to expand TVET intake by 2020, including international students in private institutions.

To ensure that TVET meets industry requirements, the following changes are being made under the Eleventh Malaysia Plan 2016–2020:

(a) Provide high-profile and diverse career choices for students to overcome limited recognition of TVET institutions.
(b) Offer greater specialization of TVET institutions and creation of Centers of Excellence in specialized fields of expertise.
(c) Establish a common rating system for public and private TVET institutions.
(d) Implement a single qualification system and expedite program approvals.
(e) Substantially expand the intake of TVET institutions by 2020.

The strategy seeks to overcome the large fragmentation that exists in the governance structure of Malaysia's TVET institutions. There are currently seven ministries and agencies offering skills training, over 500 private education providers, and a multiplicity of governance systems. Rather than consolidating TVET governance into a single institution, the 11MP 2016–2020 creates a single accreditation system to be managed by the Malaysian Qualifications Agency and Human Resources Ministry's Department of Skills Development.

The Higher Education Blueprint 2015–2020 targets a 2.5-fold increase in TVET enrollment, which represents a major challenge, given the low attraction that TVET programs have, compared with academic degree-based programs. It will require a mindset change, not only for potential students, but also for policy makers to make TVET and academic pathways equally valued. Indeed, there is already a large supply deficit of TVET graduates in Malaysia's 12 national key economic area (NKEA) sectors, which include the palm oil, tourism, financial services, electronics, business services, communications content and infrastructure, education, agriculture, oil and gas, wholesale and retail trade, and health care industries. The blueprint aims to remedy the supply imbalance by working closely with key industries to reduce or eliminate supply deficits. Among the initiatives proposed are the increased coordination of TVET providers supported by different ministries in order to eliminate program duplication, a more streamlined national qualification framework, alignment of TVET programs with industry requirements, and international accreditation of TVET programs.

15.2 Stocktaking Sabah's Higher Education Institutions

15.2.1 Private Higher Education Institutions

Foreign academic students mainly attend private schools. Only a few public institutions will accept foreign students and only subject to space availability. Universiti Malaysia Sabah, for example, has a quota for foreign student admission. The Annex to this chapter lists Sabah's 23 private higher education institutions with academic degree programs, accredited by the Malaysian Qualifications Agency as having achieved the necessary quality standards.[70]

[70] Malaysian Qualifications Agency. Malaysian Qualifications Registry. http://www2.mqa.gov.my/mqr / and http://www2.mqa.gov.my/mqr/english/eakrbykomuniti.cfm?CodeID=24&OrderBy=NegeriBM.

Table 15.2. Number of Sabah's Private Higher-Education Degree Programs, by Institutions and Fields

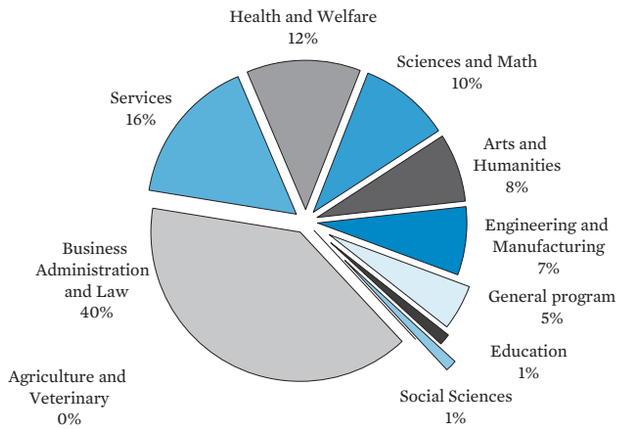
	Institutions	Fields
Bachelor	3	9
Certificate	4	9
Diploma	21	60
Foundation	2	3
Total	**30**	**81**

Source: Malaysian Qualifications Agency. Malaysian Qualifications Registry. http://www2.mqa.gov.my/mqr/.

Of these private higher education institutions, 3 offer bachelor's degrees; 2 offer foundation degrees, equivalent to two-thirds of a bachelor's degree; 21 offer diplomas based on 24- to 36-month programs; and 4 offer certificates from taking a series of courses in a particular subject (Table 15.2).[71] Hence, nearly 70% of the degrees offered are in the form of diplomas and another 13% are certificates, while 10% are in the form of bachelor's degrees.

Sabah's 23 private higher education facilities offer a total of 81 fields of study (Figure 15.1 and Table 15.3).[72] Cosmopoint International College of Technology's Kota Kinabalu branch and Kolej Pusat Teknologi dan Pengurusan Lanjutan in Sabah offer the most fields of study, followed by INTI College Sabah. Cosmopoint International College of Technology in Kota Kinabalu offers programs leading to a diploma in business and accounting, information technology, tourism, and hotel management, among others.

Figure 15.1. Distribution of Sabah's Private Higher-Education Degree Fields



Note: Classified by National Education Code of Malaysia.
Source: Malaysian Qualifications Agency. Malaysian Qualifications Registry. http://www2.mqa.gov.my/mqr/.

- Kolej Pusat Teknologi dan Pengurusan Lanjutan in Sabah is part of Management and Science University, whose main campus is in Sham Alam, the state capital of Selangor near Kuala Lumpur. The Sabah campus is located in Kota Kinabalu, and it offers diploma programs in business administration and management, computer sciences, electronics and automobile, tourism, audiovisual media, and medical diagnostics and treatment technology.
- INTI College in Sabah is part of INTI International University, whose campus is in Negeri Sembilan, south of Kuala Lumpur. The Sabah campus has 12 diploma and bachelor's degree programs that focus on hospitality and business education.

15.2.2 Degree Fields

The distribution degree fields offered by Sabah's private higher-education institutions is shown in Table 15.3 and detailed in Table 15.4. The following observations are noted:

- *Business administration* programs are, by far, the dominant degree field. Within this area, general business administration, management, and accounting represent over 70% of all programs. Only one institution offers a degree in banking and finance.

[71] Note that some institutions offer more than one type of degree. So the total number of degree types offered exceeds the total number of institutions.

[72] There are important public institutes such as Politeknik Kota Kinabalu that offer extensive programs, but they are only open to Malaysian citizens.

- *Services* has the second largest number of degree fields. Most of the programs are in the areas of travel, tourism, and hotel and restaurant services.
- *Health and welfare* programs, the third largest area, are fairly evenly distributed across nursing, medical diagnostics, therapy, and pharmacy.
- *Sciences and mathematics* programs are limited to computer sciences. There are no programs in the areas of biology, environmental science, physics, chemistry, earth sciences, mathematics, or statistics.
- *Engineering, manufacturing, and construction* programs have mostly single programs in the areas of architecture and town planning, civil engineering, energy, electronics, and motor vehicles. There are no fields of study in mechanics and metal work, chemical processes, material engineering, food processing, materials (wood, paper, plastics and glass), mining and extraction, applied sciences, and building and construction.
- *Social science* programs are limited to journalism. There are no degree fields in economics, political science, sociology, and psychology.
- *Agriculture and veterinary* degree programs are absent in all forms, including crop and livestock production, horticulture, forestry, fisheries, and veterinarian sciences.

Sabah's private higher-degree programs by degree fields are summarized in Table 15.3. Bachelor's degree programs are offered in the popular fields of business, management, marketing within the area of business and administration; computer sciences; and travel, tourism, hotel and restaurant services. Certificates are also offered in most of those areas, plus teacher training, journalism, and accounting. Diploma degrees make up nearly all other types of degree programs, with the exception of a foundation degree offered in general programs offered by Institut Sinaran.[73]

Table 15.3. Number of Degree Fields in Sabah's Private Higher-Education Institutions

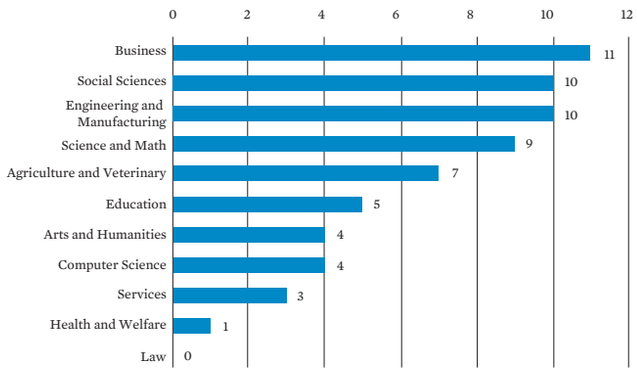
Field	NEC	Degree Fields
Basic general programs	10	4
Training for preschool teachers	143	1
Music and Performing Arts	212	2
Audiovisual techniques	213	3
Design	214	1
Journalism and reporting	321	1
Business and Administration	340	7
Wholesale and retail sales	341	1
Marketing and Advertising	342	4
Finance, banking, insurance	343	1
Accounting and Taxation	344	6
Management and Administration	345	10
Secretarial and office work	346	3
Computer Science	481	8
Electricity and Energy	522	1
Electronics and Automation	523	1
Motor vehicles, ships, and aircraft	525	1
Civil Engineering	526	1
Architecture and town planning	581	2
Health broad programs	720	1
Nursing and caring	723	2
Medical diagnostic and treatment	725	2
Therapy and rehabilitation	726	2
Pharmacy	727	3
Hotel, restaurant, and catering	811	6
Travel, tourism, and leisure	812	6
Community sanitation services	853	1
Total		**81**

Note: NEC refers to National Education Code of Malaysia.
Source: Malaysian Qualifications Agency. Malaysian Qualifications Registry. http://www2.mqa.gov .my/mqr/.

The Universiti Malaysia Sabah, though a public institution, has international students. In the 2014/2015 academic year, 165 out of 4,851 enrolled students were international students.

[73] A foundation degree is the equivalent of two-thirds of a full bachelor's degree and is a fully flexible qualification allowing students to study part-time or full-time.

Figure 15.2.Universiti Malaysia Sabah's Bachelor's Degree Fields



Note: Classified by National Education Code of Malaysia.
Source: Malaysian Qualifications Agency. Malaysian Qualifications Registry. http://www2.mqa.gov.my/mqr/.

That figure represents only 3.4% of the total student body. To achieve global recognition of Universiti Malaysia Sabah, efforts to treble international enrollment were initiated in 2015. However, of the 4,000 new students registered in 2015/2016, only 138 were international students, which represents a decline from the previous year. It has an extensive number of bachelor's degree programs and postgraduate research studies at master's and PhD levels.[74] Figure 15.2 shows that most bachelor's degree programs are in business and social sciences. There are, nevertheless, a significant number of program areas in engineering and manufacturing, science and mathematics, and agriculture and veterinary sciences.

Table 15.4. Degree Fields in Sabah's Private Higher-Education Institutions, by Number of Degree Types

Field	NEC	Bachelor	Certificate	Diploma	Foundation	Total
Basic/broad, general programs	10	1			3	4
Training for preschool teachers	143		1			1
Music and Performing Arts	212			2		2
Audio-visual techniques and media production	213			3		3
Design	214			1		1
Journalism and reporting	321		1			1
Business and Administration	340	1	1	5		7
Wholesale and retail sales	341			1		1
Marketing and Advertising	342	1		3		4
Finance, banking, insurance	343			1		1
Accounting and Taxation	344		1	5		6
Management and Administration	345	2	1	7		10
Secretarial and office work	346			3		3
Computer Science	481	1	1	6		8
Electricity and Energy	522			1		1
Electronics and Automation	523			1		1
Motor vehicles, ships and aircraft	525			1		1
Civil Engineering	526			1		1
Architecture and town planning	581			2		2
Health broad programs	720			1		1
Nursing and caring	723			2		2
Medical diagnostic and treatment technology	725			2		2
Therapy and rehabilitation	726			2		2
Pharmacy	727			3		3
Hotel, restaurant and catering	811	1	2	3		6
Travel, tourism and leisure	812	1	1	4		6
Community sanitation services	853			1		1
Total		**8**	**9**	**61**	**3**	**81**

Note: NEC refers to National Education Code of Malaysia.
Source: Malaysian Qualifications Agency. Malaysian Qualifications Registry. http://www2.mqa.gov .my/mqr/ (accessed 6 May 2017).

[74] For details, see http://www.etawau.com/edu/UniversitiesPublic/UMS.htm.

Figure 15.3. Malaysia's INVITE Initiative

Source: SkillsMalaysia Invite. http://www.skillsmalaysiainvite.gov.my/.

15.2.3 New Vocational Training Focus

The key strategic objectives for Sabah's TVET are as follows:[75]

(a) Work with industry to identify needed skill sets.
(b) Inspire youth, including the unemployed, to develop skills relevant to their passions.
(c) Encourage parents to send children to TVET instead of academic institutions since those with skills are more employable.
(d) Instill entrepreneurial skills to establish small businesses.

These objectives are in line with efforts of the Eleventh Malaysia Plan 2016–2020 to enable industry-led TVET (a) by making it commensurate to academic degree programs, and (b) by expanding the number and capacity of training institutions in Sabah.

[75] Based on discussions held with Sabah's Ministry of Human Resources Permanent Secretary Datuk Bruno Vun.

According to discussions with the Ministry of Human Resources, most of the TVET in Sabah are public, and are reserved exclusively for nationals. Yet the Ministry of Human Resources is promoting TVET for international students in Malaysia (Figure 15.3). The International Technical Education and Vocational Training Program in Malaysia (or better known as INVITE) is a government initiative designed specifically for international students. It was developed with the aim of producing graduates with comprehensive skills and knowledge in technical and vocational disciplines to become skilled employees or entrepreneurs. The Department of Skills Development of the Ministry of Human Resources Malaysia is the government agency responsible for coordinating the implementation of the SkillsMalaysia INVITE program. The Department of Skills Development believes that this program will provide an opportunity for international students to equip themselves with valuable skills that can enhance their employability. Five package programs ranging from 1 to 5 years offer certificates at the International Accredited Training Center in 29 programs.[76] Program enrollment in 2016 was low. In that year, of the 14 programs operating in Malaysia having a total quota of 900 students, only 103 students, or 11.4% of the quota, were enrolled.

Making TVET program perceptions of equal value to those of academic degree programs is a challenge for both individuals and policy makers. Yet the Higher Education Blueprint 2015–2025 aims to shift those perceptions by elevating TVET programs to quality education and making it attractive to high-performing students. From a practical perspective, and as mentioned earlier, the blueprint aims to transform perceptions by focusing TVET programs more specifically toward the 12 national key economic area (NKEA) sectors highlighted under the Economic Transformation Program. Among those of specific importance to Sabah are palm oil, health care, tourism, financial services, business services, wholesale and retail trade, electronics and electrical, agriculture, and communications and infrastructure.

In additional to the NKEA sectors, Sabah is making efforts to move the state to higher-order value activities. As such, the current phase (2016–2025) of the Sabah Development Corridor focuses on the emergence of the state as a leading economic center of high-value activities in Asia, with a focus on five sectors for development:[77]

- *Tourism* in the Kinabalu Gold Coast Enclave
- *Energy* in the Brunei Bay Integrated Development area
- *Livestock* in the Interior Food Valley
- *Research and development* in the Bio-Triangle
- *Marine resources and palm oil* in the Agro-Marine Belt

These focal activities point to the need for Sabah's TVETs to concentrate on industry-specific programs with industry involvement in curriculum designs.

[76] For details, see http://www.skillsmalaysiainvite.gov.my/programmes/.
[77] Government of Malaysia. 2014. Sabah Development Corridor 2008–2025. ABC Media Conference and Workshop 2014. Ho Chi Minh City, Viet Nam. 22–25 May. http://abcm.org.my/abcmfiles/uploads/2014/06/mr-chong-shu-yaw-sabah.pdf.

15.3 Stocktaking North Kalimantan's Higher Education Institutions

Borneo Tarakan University (Universitas Borneo Tarakan) is located in Tarakan city. It was founded in 1999 as a private university and in 2010 it became a public institution. It has 13 faculties in the areas of agribusiness, agro-technology/agronomy, aquaculture, economics and development studies, law, management, management of marine resources, Indonesian language and literature education, English language education, biology education, mathematics education, electrical engineering, civil engineering. There are currently 5,400 students, 210 lecturers, and 180 administrative staff. It collaborates with Universiti Malaysia Sabah, as well as Universiti Brunei Darussalam, for example, in exchange programs in fisheries and education.

Vocational public high schools also specialize in agriculture and fisheries-related training programs. Once such school is SMKN III Juata Tarakan (Juata Tarakan Vocational Public High School III), which offers programs in agri-processing, marine sciences, management of fishing fleets, business practices in fisheries, including seaweed production, and fish processing technology. Practical training and internship programs are offered to students within the province, along with workshops and seminars. There are currently 550 students and 40 teachers in the school.

15.4 SWOT Analysis

This section reports on the results of a survey of five higher education and TVET institutions in Sabah State. Three of them are private and two are public entities.[78] The survey was conducted on 21–25 November 2016 and consisted of a questionnaire with 43 structured questions and one open-ended question. The structured questions are based on a Likert scale in which respondents specify their level of agreement or disagreement on a symmetric agree–disagree scale ranging from 1 (strongly disagree) to 5 (strongly agree) for the series of statements. Thus, the range captures the intensity of their feelings for the given items.

15.4.1 Internal Strengths and Challenges

Higher education and vocational training institutions in Sabah generally have a favorable view about the ability of their institutions to attract international students and offer them a high-quality learning experience. These views are reflected in the observations made in the top half of Figure 15.4. Sabah's higher education and vocational institutions are relatively low cost and mostly affordable to foreign students like those of North Kalimantan, and the Malaysian Quality Evaluation System for Private Colleges system gives an overall excellent rating to Sabah's higher education institutions. Moreover, graduation rates in Sabah's higher education institutions are high, with 85% of students graduating with degrees or full certificates.

[78] The institutions consisted of Sabah Institute of Arts (private), Almacrest International College (private), University Malaysia (public), Asian Tourism International College (private), and Kota Kinabalu Training Institute (public).

For actual and potential educational and vocational offerings to North Kalimantan students, Sabah's institutions have a competitive advantage over insofar as North Kalimantan students are able to develop their English language skills and receive an excellent education. And administrators generally perceived North Kalimantan secondary school graduates to be well qualified to enter special focus schools, associate (2-year) colleges, and baccalaureate schools.

On the downside, while administrators perceived online educational courses (distance education) to be growing and becoming a significant teaching channel, none of the institutions interviewed offered distance education programs, nor were they planning to institute such programs. Sabah educational institutions would do well to make greater use of online access to class schedules, online registration, online student aid applications, and wireless networks on campuses if they are to remain internationally competitive.

Sabah's educational administrators expressed concern about several factors that inhibit their institutions from more effectively attracting international students, with the result that enrollment growth has been slow and uneven. Of most concern is the fact that Sabah's

Figure 15.4. Internal Strengths and Weaknesses of Sabah's Medical Tourism Industry

IT = information technology, QUEST = Quality Evaluation System.
Source: Based on interviews conducted on 21–25 November 2016.

public and private academic and vocational institutions are generally underfunded, making it difficult to develop course programs and market existing offerings. Infrastructure is lacking with respect to physical, financial, and human resources, with the result that campuses are often underdeveloped and lack facilities. Faculty and student scholarships lack sufficient financial support, with the result that institutions are subject to a brain drain and have difficulty attracting high-quality students who have financial constraints.

Additionally, Sabah's educational offerings are localized, with little if any international marketing; whereas, internet-based social media and globalization trends require rethinking of Sabah's approach to expanding its educational and vocational offerings.

With respect to the North Kalimantan market, the following concerns were expressed by administrators. First, North Kalimantan's market potential is unknown, so it is difficult to target learning for the types of programs that would attract students from that province. Second, Sabah has very limited online courses and programs (distance education) with which to reach a broad segment of the North Kalimantan market. And, third, there is often a lack of seamless credit transfers between institutions in North Kalimantan and Sabah.

15.4.2 External Opportunities and Vulnerabilities

There is limited information about the international competitiveness of Sabah's higher learning and vocational training institutions. All educational administrators interviewed indicated the need for research into the programs and pricing of educational institutions in other countries in the regions, as well as surveys of student interests and postgraduate employment requirements to enhance Sabah's competitiveness in the regional and global markets (Figure 15.5). As part of that analysis, administrators expressed a strong interest in better aligning their higher education and vocational training programs with employment needs within Sabah and the rest of Malaysia. An example is the opportunity of Sabah's educational system to better support the state's health care system and, in so doing, back medical tourism's growth in the state.

For the North Kalimantan market, the high population growth of the province was perceived to offer large potential demand prospects for Sabah. One way to promote greater participation would be for Sabah to revive its twinning system instituted in 1996 to provide the first 2 years in Sabah educational institutions and the next 2 years in Indonesian colleges. Another promotion mechanism would be to establish recruiting offices in North Kalimantan and other Indonesian provinces to target Indonesian students for Sabah's higher education institutions and vocational training programs.

The largest threat to Sabah's educational system is the currently excessive concentration of business schools and MBAs rather than engineering, veterinary, and other specialized areas, according to educational administrators interviewed. Their view strongly suggested that advanced university degrees are becoming less important to employers as degree glut gives rise to an overqualified workforce; and there is excessive focus on higher education rather than vocational training, where there are more job opportunities. Vocational training degree programs have a stigma and continue to be shunned in favor of traditional college programs.

Figure 15.5. External Opportunities and Threats to Sabah's Medical Tourism Industry

N. Kal. = North Kalimantan, TVET = technical and vocational education and training.
Source: Based on interviews conducted on 21–25 November 2016.

Annex: Sabah's Private Higher Education Institutions

Institution	Degree Fields	Degree Offered
AMC School of Business	Computer Science (481); Accounting and Taxation (344)	Diploma
Aseana International College of Health Sciences	Nursing and caring (723)	Diploma
Asia Metropolitan College Kota Kinabalu	Accounting and Taxation (344); Community sanitation services (853); Medical diagnostic and treatment technology (725); Nursing and caring (723); Pharmacy (727); Therapy and rehabilitation (726); Health broad programs (720)	Diploma
ATI College	Hotel, restaurant, and catering (811); Travel, tourism, and leisure (812); Accounting and Taxation (344); Business and Administration (340); Management and Administration (345)	Certificate and Diploma
Cosmopoint International College of Technology Kota Kinabalu Branch	Architecture and town planning (581); Management and Administration (345); Audiovisual techniques and media production (213); Hotel, restaurant, and catering (811); Business and Administration (340); Secretarial and office work (346); Computer Science (481); Pharmacy (727); Marketing and Advertising (342); Travel, tourism, and leisure (812); Accounting and Taxation (344)	Diploma
Eastern College	Management and Administration (345); Computer Science (481); Music and Performing Arts (212)	Diploma
Institut Sains dan Pengurusan	Management and Administration (345); Basic/broad, general programs (10)	Diploma
Institut Sinaran	Business and Administration (340); Basic/broad, general programs (10)	Foundation and Diploma
INTI College Sabah	Accounting and Taxation (344); Management and Administration (345); Business and Administration (340); Marketing and Advertising (342); Computer Science (481); Hotel, restaurant, and catering (811); Travel, tourism, and leisure (812); Basic/broad, general programs (10)	Bachelor and Diploma
Jesselton College	Management and Administration (345); Business and Administration (340)	Bachelor and Diploma
Kiara College	Management and Administration (345); Secretarial and office work (346); Hotel, restaurant, and catering (811)	Diploma
Kinabalu Commercial College	Management and Administration (345); Travel, tourism and leisure (812)	Diploma
Kolej Antarabangsa AlmaCrest	Travel, tourism, and leisure (812); Marketing and Advertising (342); Secretarial and office work (346); Wholesale and retail sales (341); Accounting and Taxation (344)	Diploma
Kolej Ibukota Kinabalu	Computer Science (481)	Diploma
Kolej MAHSA Kampus Sabah	Pharmacy (727); Therapy and rehabilitation (726); Medical diagnostic and treatment technology (725)	Diploma
Kolej Yayasan Sabah (Kampus B)	Motor vehicles, ships, and aircraft (525); Civil Engineering (526)	Diploma
Kolej Yayasan Sabah	Management and Administration (345); Hotel, restaurant, and catering (811); Journalism and reporting (321); Audiovisual techniques and media production (213); Computer Science (481); Electricity and Energy (522); Accounting and Taxation (344)	Certificate and Diploma
Multimedia College (Sabah)	Computer Science (481); Audiovisual techniques and media production (213); Management and Administration (345); Marketing and Advertising (342); Electronics and Automation (523)	Diploma

continued on next page

Annex *continued*

Institution	Degree Fields	Degree Offered
North Borneo University College	Travel, tourism, and leisure (812); Basic/broad, general programs (10)	Foundation and Diploma
Open University Malaysia	[105 fields]	Diploma, Bachelor, Master, PhD
Sabah Institute of Art	Architecture and town planning (581); Design (214); Music and Performing Arts (212)	Diploma
SIDMA College	Training for preschool teachers (143)	Certificate
Tunku Abdul Rahman University College	Business and Administration (340); Computer Science (481); Hotel, restaurant, and catering (811); Finance, banking, insurance (343)	Certificate and Diploma

Notes:
(1) Numbers in parentheses refer to the National Education Code of Malaysia.
(2) *Foundation Degree*: A foundation degree is the equivalent of two-thirds of a full bachelor's degree and is a fully flexible qualification allowing students to study part-time or full-time.
(3) *Diploma Degree*: Diplomas in Malaysia are usually 24- to 36-month programs.
(4) *Certificate*: Certificates are earned by taking a series of courses in a particular subject.
Source: Elaborated by the authors.

PART VII

Program Design

Summary

The cross-border trade and investment program needs to be grounded on a comprehensive plan of action that conceptualizes and operationalizes a strategy and action plan driven by a set of flagship projects to serve as high-profile entrepreneurial successes. The plan is embodied in the Sabah–North Kalimantan Border Economic Area Program.

To that end, we begin with the design of (a) a *strategic plan* that elaborates the long-term or overall aims and interests of the program and the means of achieving them; (b) a *master plan* that describes the outcome of the program and what key interests groups would experience in the transformed territories; and (c) an *action plan* that describes how the transformation of the territories will be accomplished. By elaborating a comprehensive medium- to long-term plan, we ensure that the interests of all stakeholders are well-integrated into its design and that the best use is made of each territory's natural and human resources.

As such, the Sabah–North Kalimantan Border Economic Area Program specifies the mission, vision, and strategic plan that describes what stakeholders want to accomplish over the medium to long term under the *strategic plan*. From the practical perspective, it describes the channels, institutions, and other components that stakeholders will experience once the program is operationalized under the *master plan*. Finally, it describes how the program will be implemented in close consultation with government officials, and representatives of the private sector and local communities under the *action plan*.

The investment program comprises (a) establishment of Sabah as a leading medical tourism center; (b) expansion of international private technical and vocational education and training and higher education aligned with Sabah's needs; (c) development of cross-border value chains between Sabah and North Kalimantan in palm oil, wood products, fisheries, and organic foods; (d) promotion of Sabah–North Kalimantan tourism complementarities; and (e) capacity-building support.

Key features are as follows: First, the program focuses on the socioeconomic development of the two territories with a poverty-based focus. Second, it lays out a pragmatic and sector-focused implementation approach to ensure that commercial, social, and environmental interests are advanced. Third, it concentrates on relatively few high-profile initiatives that have direct links to key strategic aims of the private sector and objectives related to social, environmental, and multimodal transport development. These so-called flagship projects are to produce a large, demonstrable impact for others to follow in the core development areas of agri-industry, tourism, education and training, and infrastructure.

16

Strategic Plan

16.1 Typology

The Sabah–North Kalimantan Border Economic Area Program provides an all-inclusive coverage of the principal components making up the strategy and action plan for (a) Indonesia's border development program along the North Kalimantan border, and (b) Malaysia's efforts to expedite cross-border trade in goods and services along Sabah's border.[79] In designing a fully integrated border economic area, Table 16.1 offers a typology of possible parameters that can help to frame specific components of the border area development plan.

Table 16.1. Typology of Parameters for the Sabah–North Kalimantan Border Economic Area Program

Border Economic Area Concept	Possible Objectives	Potential Components
• *Clusters of activities* covering the operation of a network of interconnected businesses and associated institutions spread over a wide geographic area. • *Varying degrees of collaboration across borders*, either operating independently or together through quasi-formal or formal mechanisms. • *Cross-border networks of productive activities* to produce goods and services in specific industries. • *Well-defined goals selected from a broad spectrum of development options,* with clearly delimited goals. • *No one size fits all*, since each area has diverse needs and socioeconomic characteristics.	• *Alleviate poverty* and improve well-being of households in the border region. • *Lower income inequality* among districts or provinces. • *Accelerate economic growth* of the target areas. • *Exploit complementarities* with neighboring countries and promote cross-border value chains, trade, and investment. • *Attract population into border regions* to reverse agglomeration trends and congestion in major urban centers. • *Achieve stability* and eliminate effects of insurgencies in neighboring countries.	• Industrial estates and special economic zones. • Transport and logistics. • Trade and transport facilitation. • Customs, immigration, quarantine, and security facilities. • Border townships. • Business development service centers. • Health and education. • Public utilities. • Regulatory framework. • Border and behind-the-border trading costs. • Financing and credit guarantee facility.

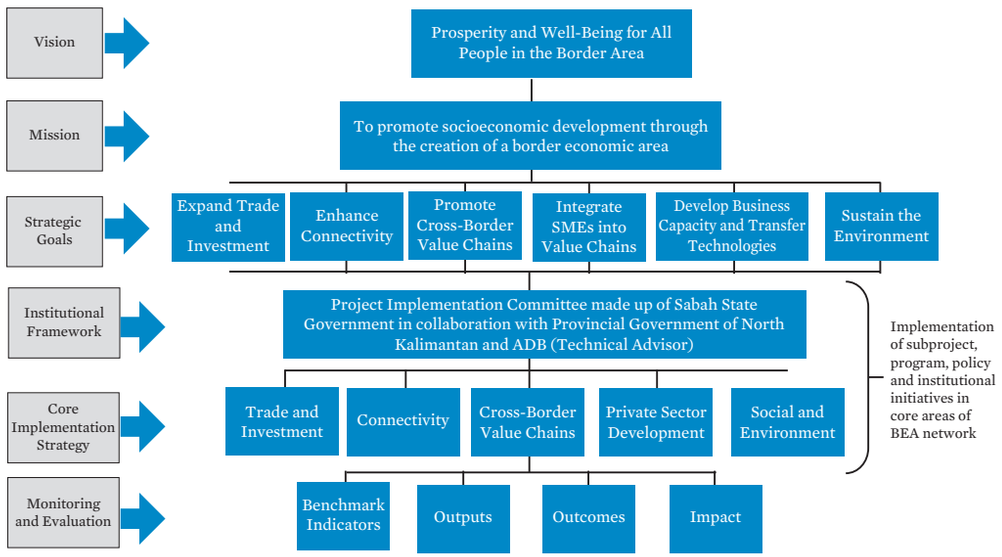
Source: Authors' representation.

16.2 Constituents

Vision and Mission: The proposed *Vision* for the Sabah–North Kalimantan Border Economic Area Program is a holistic approach to the development of cross-border trade and investment

[79] ADB. 2016. Strengthening BIMP-EAGA Investment Corridors – Stakeholders Kick-Off Meeting. Sabah State Planning Agency, Kota Kinabalu, Sabah, Malaysia, 27 October. Manila.

Figure 16.1. Strategic Plan for Sabah–North Kalimantan Border Economic Area



ADB = Asian Development Bank, BEA = border economic area, SMEs = small and medium-sized enterprises.
Source: Authors' representation.

in such a way as to bring widespread prosperity to the border area. The *Mission* is to give explicit recognition to the interconnectedness of cross-border trade and investment with other socioeconomic components that achieve their welfare-enhancing goals only by reference to the whole interconnected development of the border economic area. Figure 16.1 provides a visual representation of the strategic plan.

Strategic Goals: Because of the close interconnectedness of program components, the strategic goals of the Sabah–North Kalimantan Border Economic Area give equal weight to the cluster of activities to expand trade and investment, enhance connectivity, promote cross-border value chains, integrate small and medium-sized enterprises (SMEs) into those value chains, develop business capacity, transfer technologies across borders, and ensure environmental sustainability in the area. In specific applications, however, the weights assigned to each of these components may change, based on the preference ordering of different stakeholders.

Institutional Framework: Implementation arrangements for the Sabah–North Kalimantan Border Economic Area establishes a hierarchy of responsibility for distinct management functions to ensure that overall project implementation proceeds seamlessly and promptly.

- *North Kalimantan*: The Provincial Government of North Kalimantan will act as the secretariat for the project, while the Asian Development Bank (ADB) will provide technical advice and support when requested. The government will also seek to collaborate with the Sabah State Government when necessary. The North Kalimantan Provincial Government will manage the operational aspects of the project and carry out day-to-day oversight. To facilitate communication among the different agencies within the provincial government, a project implementation committee or task force will be created.

- *Sabah:* The Sabah State Government will act as the secretariat for the project, while ADB will provide technical advice and support when requested. The government will also seek to collaborate with the Provincial Government of North Kalimantan when necessary. The Sabah State Government will manage the operational aspects of the project and carry out day-to-day oversight. To facilitate communication among the different agencies within the state government, a project implementation committee or task force will be created at the onset of the Sabah–North Kalimantan Border Economic Area.

Monitoring and Evaluation: The monitoring and evaluation system developed to track border economic area progress and performance will adopt standard procedures such as the logical framework or a results framework, based on recommendations of the Project Implementation Committee. As a minimum, the monitoring and evaluation system will contain benchmark indicators that identify conditions at the start of the border economic area implementation process, and appropriate indicators for outputs, outcomes, and impact. Those indicators should be comprehensive, insofar as they cover all the project components, and be based on quantitative and qualitative information that reflects current or existing conditions in each component and the overall project.

Given its broad scope and the close interconnectedness of its parts, it is essential (a) that the core implementation strategy of the Sabah–North Kalimantan border area encompass all aspects of the clusters that make up the cross-border network of productive activities being targeted; and (b) that those activities be treated in a holistic manner.

17

Master Plan

17.1 North Kalimantan Interests

The master plan incorporates the following provincial and national development plans and programs:

- *North Kalimantan's current 2020 master plan*. Among its major goals are an increased competitiveness in sustainable agro-processing industries, tourism and mining, and the elimination of poverty and unemployment. It focuses on connectivity and other supporting infrastructure, and key sector development plans for manufacturing, agriculture and agri-foods, capture fisheries and aquaculture, medical tourism, and downstream activities in palm oil.
- *Indonesia's new border economic area plan*. The plan targets border regions throughout the country to bolster economic growth of those areas, lower poverty in disadvantaged areas, and help reverse the country's trend toward agglomeration in major cities. North Kalimantan has been designated a high-profile demonstration pilot project for the plan. It will seek to (a) generate greater employment and more value-added activities that will improve living standards, reduce poverty, and lower inequality in the targeted border areas; (b) accelerate economic growth through increased productivity associated with economies of scale and production complementarities with neighboring countries like Malaysia; and (c) accelerated border activity to reverse the negative investment effects from agglomeration of activities in major urban centers. The pilot project for North Kalimantan is critically important for moving the national plan forward, both in mapping the way for transforming border provinces into dynamic growth areas and demonstrating that success in North Kalimantan can pave the way forward for other border provinces.

17.2 Sabah's Interests

The master plan incorporates the following provincial and national development plans and programs:

Economic Transformation Program and National Key Economic Areas. Sabah's development plans are closely aligned with the Malaysia's Economic Transformation Program (ETP) and the national key economic areas (NKEAs) to transform the country into a high-income nation by the year 2020. The country's most recent development plan, the Eleventh Malaysia Plan, builds on the so-called National Transformation Policy 2011–2020, which focuses on the implementation of the New Economic Model (NEM). It set the achievement of a high-income, inclusive, and sustainable economy as the country's principal goal.

National Transformation Policy 2011–2020. The National Transformation Policy 2011–2020 focuses on seven strategic targets: (a) greater reliance on productivity to drive growth; (b) shifting from state-led to private-led investment and production; (c) achieving greater local autonomy, with accountability; (d) achieving greater economies of scale from clustering; (e) attracting technologically capable firms; (f) targeting emerging Asian and Middle Eastern markets; and (g) promoting skilled talent. These targets are, in turn, to be achieved through the following channels: (i) private sector driven growth; (ii) a quality workforce; (iii) a competitive domestic economy; (iv) a strengthened public sector; (v) a transparent and market-friendly affirmative action; (vi) a larger knowledge base and infrastructure; (vii) diversifying sources of growth; and (viii) ensuring sustainable growth.

Eleventh Malaysia Plan. The Eleventh Malaysia Plan defines six strategic drivers to transitioning the country into the type of advanced economy that the NEM envisioned: (a) greater inclusiveness in an equitable society; (b) improved well-being for all people; (c) enhanced human capital development; (d) green-based growth; (e) strengthened infrastructure that supports economic expansion; and (f) economic growth derived from knowledge-intensive services, productive manufacturing, and a modernized agriculture.[80]

Six channels define the way these objectives are to be achieved: (i) expanded productivity to accelerate economic growth; (ii) innovative methods of generating revenue; (iii) the promotion of TVET as a means of developing a high-skilled workforce; (iv) use of cities as a source of competitiveness; (v) expanded well-being of the bottom 40% household income group; and (vi) green growth to achieve long-term sustainability of the environment. For Sabah's trade in goods and services with North Kalimantan, the two most important channels are (i) productivity expansion, and (iii) technical and vocational education and training (TVET) and skilled labor development.

17.3 Sabah–North Kalimantan Border Economic Area Master Plan

The Sabah–North Kalimantan Border Economic Area master plan provides the building blocks to transform Sabah's and North Kalimantan's trade with one another into one of the main driving forces for their respective economies. To achieve this transformation, an integrated approach that encompasses both core and supporting soft and hard infrastructure is a necessary but insufficient condition. Such infrastructure is necessary to promote commercial activities. But it needs to be accompanied with a new mindset for both public and private stakeholders; one that shifts from an inward-looking development strategy that has promulgated mistrust, to one that (a) facilitates collaboration between government officials across borders, and (b) promotes openness and transparency between industry-wide businesspersons to help forge alliances across borders.

In line with Sabah's and North Kalimantan's overall interests, the targets of the border economic area development plan are as follows:

- Add value to resource-based activities by moving production into high-value activities;
- Expand productivity;

[80] Government of Malaysia. 2015. *Eleventh Malaysia Plan 2016–2020: Anchoring Growth on People*. Kuala Lumpur.

- Achieve greater economies of scale from clustering;
- Attract technologically capable firms;
- Target emerging regional markets in Asia as well as the Middle East; and
- Promote skilled labor.

These targets are to be achieved through the following channels:

- Private sector driven growth;
- An enhanced competitive economy;
- Strengthened public sector, oriented toward facilitating private sector activity;
- Infrastructure that supports economic expansion;
- Transparent and market-friendly regulations;
- Larger knowledge base and technology absorption;
- Promotion of TVET as a means of developing a high-skilled workforce;
- Diversified sources of growth, especially in high-value production and service-oriented activities; and
- Emphasis on sustainable growth in ecotourism, organic agriculture and fisheries, and sustainable wood processing.

Implementation of the plan includes three main programs that contain seven core projects. The programs are as follows:

1. *Integrated program* of core activities supporting a Sabah–North Kalimantan Border Economic Area;
2. *Connectivity improvement program* facilitating two-way trade and cross-border value chains; and
3. *Value-chain development program* promoting upstream and downstream collaboration along the supply chains of seven key industries.

18

Action Plan

18.1 Core Implementation Strategy

The Core Implementation Strategy consists of subprojects, programs, policies, and institutional initiatives designed to advance cross-border trade and investment; improve connectivity; implement cross-border value chains; develop the private sector, especially linkages between small and medium-sized enterprises (SMEs) and large companies; promote meso programs and policies that advance human development in the areas of health, education, and security; and ensure the sustainability of the environment and management of natural resources.[81]

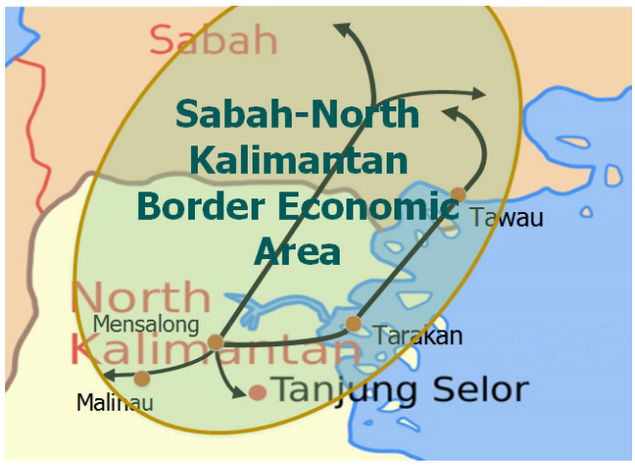
In the operational context, it is important to emphasize that the border economic area extends well beyond conventional special economic zones located in narrow physically defined spaces, often in secured areas with a single management and administration. The Sabah–North Kalimantan border economic area instead covers a network of activities spread over a large geographic area, with activities that are nevertheless intimately interconnected with one another.

18.2 Geographic Coverage

Figure 18.1 shows the geographic coverage of the Sabah–North Kalimantan border economic area.

- *North Kalimantan*: It covers the regency of Nunukan and the city of Tarakan. It also encompasses, where necessary, other regencies such as Malinau for project activities related to organic vegetables, oil palm, and wood.
- *Sabah*: It covers, but is not limited to, the Interior District and Tawau District. It extends to other districts that contribute goods and services such as medical tourism to border economic area commercial activities.

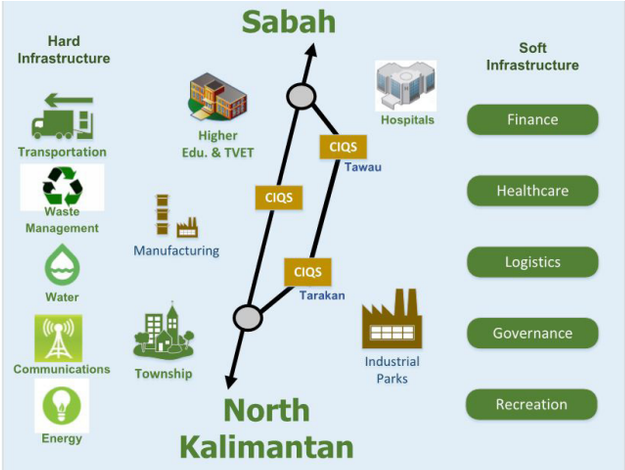
Figure 18.1. Sabah–North Kalimantan Border Economic Area



Source: Authors' representation.

[81] Meso policies are arrangements associated with structures and therefore deal with the institutional aspects of an economy.

Figure 18.2. Representation of Sabah–North Kalimantan Border Economic Area



CIQS = customs, immigration, quarantine, and security; TVET = technical and vocational education and training.
Source: Compiled by the authors.

18.3 Key Components

Figures 18.2 and 18.3 show the key components characterizing the Sabah–North Kalimantan border economic area. They cover the border crossings, customs, immigration, and quarantine (CIQ) and customs, immigration, and quarantine, and security (CIQS) facilities, transport networks, industrial estates, border towns, knowledge centers, and supporting infrastructure.

Border Crossings: The two border crossings in the border economic area are (a) between Tawau (Sabah) and Tarakan (North Kalimantan), and (b) the border crossing on the road connecting Kalabakan (Sabah) to Simenggaris (North Kalimantan).

CIQ Facilities: On the Sabah side, there is a CIQ facility Tawau on the Sabah side, and a CIQ facility in Tarakan on the North Kalimantan side. Once the road connecting Kalabakan in Sabah to Simenggaris in North Kalimantan is completed, there are plans to establish a CIQ facilities on either side of the border.

Transport Networks: See Chapter 7 for a complete description of the existing and planned air, sea, and road networks.

Border Towns:

- *North Kalimantan side*: The city of Tarakan is currently the province's central commercial hub. Once the overland road is completed, the town of Malinau in Malinau Regency, as well as Mensalong town in Nunukan Regency will become major commercial hubs.
- *Sabah side*: Tawau is a large commercial center. The township of Kalabakan will likely expand into a commercial center once the overland road is finished.

Knowledge Centers:

- *North Kalimantan*: The major educational institution, University of Borneo, is in Tarakan. It has a collaborative program with Universiti Malaysia Sabah in Kota Kinabalu.
- *Sabah*: The major higher education and TVET institutions are in Kota Kinabalu. Among Sabah's private universities, Open Universiti Malaysia is in Tawau. Also in Tawau is Kinabalu Commercial College, a private higher education institute founded by a group of professional industrialists and educationists.

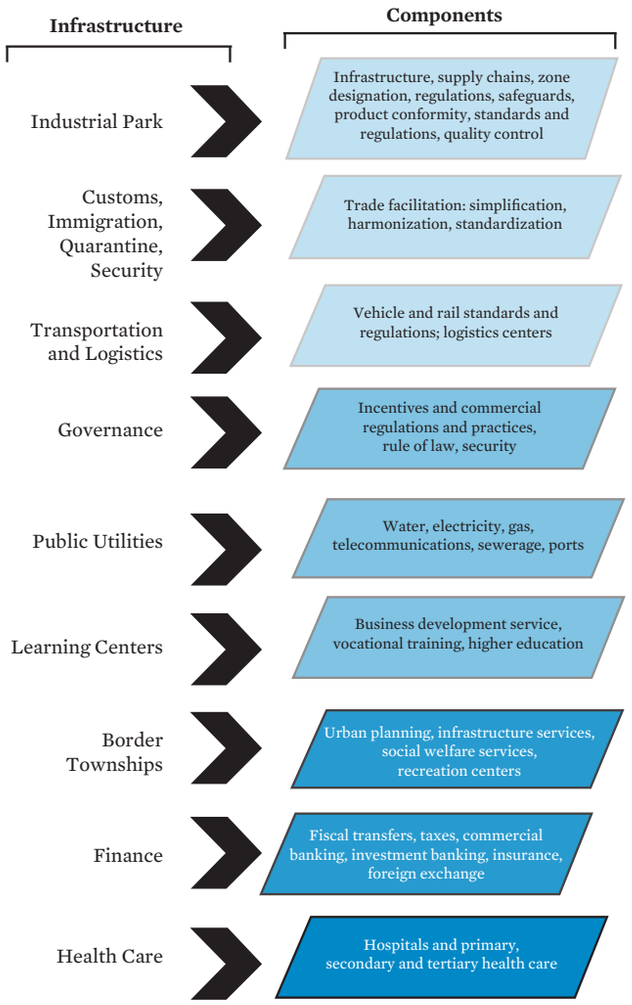
18.4 Adding Value to Tradable Goods and Services

North Kalimantan is entering a takeoff stage of development as it seeks to expand downstream activities to shift from a concentration on primary sector activities to those in the secondary (processing) sector. In contrast, Sabah's economy is transitioning from the takeoff stage of development to that of a drive-to-maturity. As such, its industrial base is becoming diversified, manufacturing is shifting from production of capital goods to durable goods, and large-scale investment is taking place in social infrastructure such as hospitals and higher education institutions.

Spatial concentration of firms across border regions combines the traditional growth area model for trade and investment based on comparative advantage and complementarities with one based on scale economies from regionalization of production activities. Clustering of these industries allows producers to bypass the need to handle the entire production process, and instead concentrate on processing stages.

The resulting complementarities permit the exploitation of differences in factors of production and generate economies of scale and "cross-hauling" or two-way trade between Sabah and North Kalimantan, thereby increasing the competitiveness of cross-border industries in regional and global markets.

Figure 18.3. Border Economic Area Components



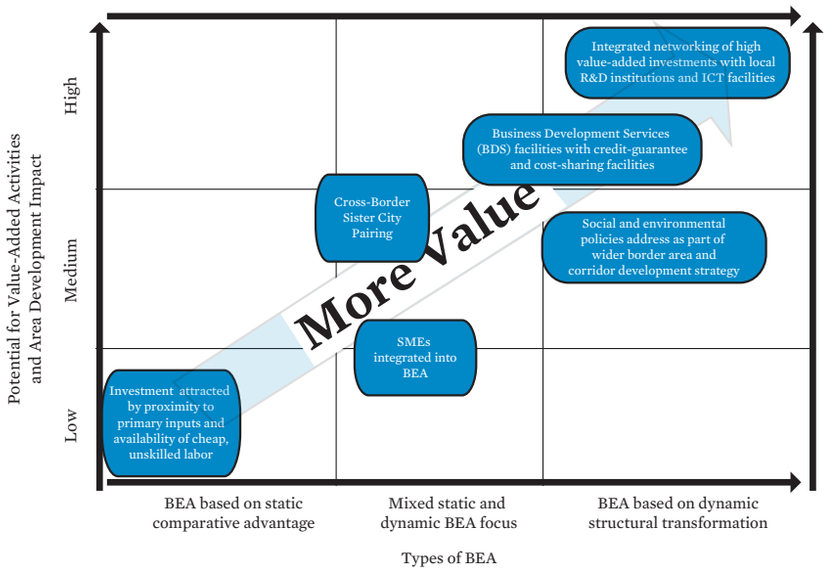
Source: Compiled by the authors.

Under the Sabah–North Kalimantan Border Economic Area Program, transnational company alliances in complementary upstream or downstream activities will be able to expand Sabah's access to much needed raw materials, while North Kalimantan will gain access to much-needed technologies with which to add value to its major industries.

The potential benefits from strategic alliances between Sabah and North Kalimantan industries are compelling: they can expedite entry into new markets; expand access to skills, technologies, and product diversity; and help to share fixed costs and resources.

Figure 18.4 shows how these three elements come together to produce dynamic forward and backward linkages in a cross-border integrated production framework that leads to increased value-added activities and economic development.

Figure 18.4. Value Adding and Development Potential of Border Economic Areas



BEA = border economic area, ICT = information and communication technology, R&D = research and development, SMEs = small and medium-sized enterprises.
Source: Elaborated by the authors.

It requires not only designing cross-border value chains in such a way as to attract investments in integrated production processes that encourage the participation of small and medium-sized enterprises (SMEs), but also broader initiatives that extend beyond the value chain in area-wide activities that encourage skills development, training, and knowledge sharing; promoting industry clusters and targeting links with zone-based firms at the cluster level; supporting the integration of cross-border value chains; and ensuring skilled labor mobility across borders.

18.5 Infrastructure Projects

Connectivity – Air connectivity is extremely limited and unreliable. In North Kalimantan, Tarakan island offers the only major air transport facility in the province. Even then, Sabah connections only exist in the island of Tawau. MASwings offers three flights per week between Tawau and Tarakan. Airline services to Tanjung Selor are often canceled because of technical difficulties.

Land transportation is also limited between North Kalimantan and Sabah. Currently, from North Kalimantan, Sabah can be reached through a 12-hour road trip from Balikpapan in East Kalimantan, and then through air or sea connections to Sabah.

A paved dual carriageway exists on the North Kalimantan side to the Sabah border, but the road on the Sabah side is unpaved. ADB is assisting Malaysia in the Kalabakan–Serudong road portion located in Tawau District. Heavy truckloads have already damaged the Serudong–Simanggaris road, and upgrades are also needed (Table 18.1).

Table 18.1. Infrastructure Projects for North Kalimantan and Sabah Border Economic Area

Project	Description
Road Connectivity	The project creates a much-needed paved roadway between North Kalimantan and Sabah, in particular, between Kalabakan and Serudong on the Malaysian side of the border. There are also plans to build new roads between Tawau and Semporna cities, as well as Kunak town. On the North Kalimantan side of the border, the existing paved dual carriageway has already suffered from heavy lorry damage, while on the Sabah side, there is no paved road. ADB is supporting road infrastructure on both sides of the border, and is also addressing the need to upgrade all existing roads damaged by heavy truck usage.
Air and Maritime Connectivity	The North Kalimantan provincial governments of Indonesia and Malaysia are supporting (a) upgrades to airline services through better airport facilities and runaway extensions in Juwata Airport of Tarakan, Tanjung Harapan Airport of Tanjung Selor, and local airports in Nunukan, Malinau, and Bulungan regencies; and (b) more extensive maritime passenger and cargo services between Tarakan and east Sabah ports through improved infrastructure facilities, greater security, and improvements in the regulatory environment. The Sabah State Government is exploring substantial upgrades to the airport and port facilities in Tawau.
Electric Power	The project addresses widespread and recurrent power outages throughout North Kalimantan, which hamper productivity and make foreign businesses wary of investing in the province. ADB is currently exploring potential infrastructure development through the province's large river network to quickly bring sustainable hydroelectric power online.

Source: Compiled by the authors.

Power – In North Kalimantan, power outages are common in Tarakan and Tanjung Selor, and foreign businesses are therefore weary of investing in those areas. Yet North Kalimantan's rivers have a large potential for providing hydroelectric power to the province. In Nunukan Regency, the North Kalimantan Provincial Government is planning to build a hydroelectric power plant along the Sembakung River in the district of Lumbis. There are also coal options, but these are less desirable.

On Sabah's eastern divisions of Tawau and Sandakan, the east coast grid has limited capacity. Electricity interconnection with North Kalimantan is being explored through BIMP-EAGA. ADB is providing technical assistance to explore mechanisms to support and promote that power interconnectivity.

PART VIII

Cost–Benefit Analysis

Summary

We use cost–benefit analysis to measure the economic viability of cross-border trade and investment between Sabah and North Kalimantan. It is the reference method used to compare alternative options based on their monetary values, and to determine preferred set of projects for people on both sides of the border.

Project economic analysis involves examining (i) current and future demand; (ii) existing sources of supply and their costs; (iii) the contribution of the proposed project to overall market demand; (iv) the benefits to be derived from the project; and (v) the net economic sustainability of the project during its lifetime based on the internal financial and economic rate of return of the project.

Sufficient time and resources need to be given to project analysis. Cost overruns of 25% or more have been reported in half of the operations carried out by international development institutions. On the benefits side, engineers often double or even triple count benefits because they lack knowledge about the distinction among expenditure, factor input or income, and value-added approaches in national income accounts.

While the results for individual projects can indicate their financial soundness, the final portfolio composition of those projects needs to incorporate different preference orderings and weights associated with each stakeholder group. For example, if small and medium-sized enterprises development is preferred over large commercial interests then, other things being equal, more investment will be directed toward organic agriculture and aquaculture than palm oil and wood processing industries.

Finally, it is important to balance efficiency, equity, and non-efficiency concerns. Monetarization of net benefits makes it easy for cost–benefit analysis to determine the *efficiency* of a project. Such efficiency promotes economic growth, diversity of products and services, and greater innovation and creativity. However, broader public policies, interests, strategies, and policies dictate the need to incorporate equity and non-efficiency considerations. *Equity* and distributional concerns can be measured separately in cost–benefit analysis through metrics of employment, wages and salaries, and household incomes.

The project analyses yield the following results: For Sabah, the economic internal rate of return (EIRR) ranges from 18% to 22% for palm oil, fisheries, medical tourism, private technical and vocational education and training and higher education. The wood products project, however, produces a much lower EIRR of less than 4%. The economic net present values (ENPVs) are highest for medical tourism (nearly $250 million) and palm oil ($114 million). The economic benefits–cost ratio (EBCR) ranges from 1.7 to 2.9 for the economically viable projects.

For North Kalimantan's projects, the EIRR ranges from 17% to 26% for palm oil, fisheries, and wood products. The ENPV is highest for wood products ($230 million). The EBCRs range from 1.5 to 2.5.

19

Palm Oil

19.1 Cross-Border Value Chain

19.1.1 Rationale

About 85% of all the palm oil in the world is produced in Malaysia and Indonesia. Indonesia produces roughly one-half of all palm oil in the world, while Malaysia produces about one-third. Indonesia's Kalimantan provinces in Borneo supply 30% of the country's total production, while Sabah accounts for nearly 30% of Malaysia's total palm oil exports.[82]

Sabah has succeeded in developing downstream activities for its palm oil industry. Yet the foundation for continued growth of manufactures, such as oleochemicals, rests on the ability of plantation companies to ensure reliable flows of palm oil. Moreover, upstream activities are also challenged by aging palm plantations, which lower productivity and represent an opportunity cost for higher-yielding new trees. For Sabah to sustain its growth of manufactures such as oleochemicals, local manufacturers are anxious to access oil palm fresh fruit bunches in nearby North Kalimantan, which like other provinces in Indonesia, is enlarging its plantings of oil palm. There are therefore potential synergies between North Kalimantan and Sabah in further developing their palm oil industries.

19.1.2 Motivation

(a) Sabah

Sabah's agricultural sector is characterized by monoculture farming, with about 90% of its land planted with oil palm. Land available for agriculture is now limited. On the one hand, dependence on a single crop is no longer viewed as appropriate for Sabah as the main engine of the state's growth. On the other hand, the conversion of forests into agricultural lands and environmental degradation is undesirable. The Sabah State Government has therefore shifted its focus dramatically its plans for the state's agricultural sector. It no longer encourages the expansion of industrial crop areas, especially oil palm estates; instead, it promotes higher yield agricultural methods like organic fruits and vegetables, as well as agro-based industries.[83]

The Government of Sabah has also shifted its focus in agri-processing industries. Currently, Sabah has the largest number of palm oil mills in Malaysia. Mill production concentrates on upstream activities involving crude palm oil, which is the state's main export. The government

[82] The Kalimantan provinces consist of East Kalimantan, Central Kalimantan, North Kalimantan, South Kalimantan, and West Kalimantan.

[83] See Section 9.3 of Town and Regional Planning Department Sabah. 2016. *Sabah Structure Plan 2033*. Kota Kinabalu, Sabah. October.

is now encouraging downstream activities within the palm oil industry like that of the Palm Oil Industrial Cluster in Lahad Datu and Sandakan. The Palm Oil Industrial Cluster has set up oleo hubs to promote production of high-value derivative products that are to triple the contribution of the oil palm sector to the state's gross domestic product. Yet land scarcity has meant that additional local sources of raw materials for palm oil processing are almost exhausted.

One way to move agriculture to other high-value activities such as organic fruits and vegetables, while simultaneously supporting downstream activities in the palm oil industry, is to source oil palm fruits from neighboring North Kalimantan. Numerous oil palm plantations in that province can provide Sabah with much-needed supplies of fresh oil palm bunches. Development of cross-border value chains with North Kalimantan could therefore provide much-needed oil palm fruit to the state. Moreover, palm oil processing operations are nearly nonexistent in North Kalimantan, so oil palm plantation owners are anxious to develop supply chain linkages with Sabah.

(b) North Kalimantan

North Kalimantan's development of cross-border value chains with Sabah could provide the vehicle with which to generate greater exports and offer much-needed investment in the construction of palm oil mills within the province. However, the current lack of adequate road accessibility between North Kalimantan and Sabah means that oil palm fruit needs to be trucked to ports, loaded onto barges for shipment to Tawau or other Sabah ports, and then loaded onto trucks for transport to mills throughout the state. Most benefits from the road construction will therefore be in the form of transport cost savings.

The Government of North Kalimantan recognizes the following in its planning framework:[84]

- Development of palm oil plantation estate will benefit the economy of the province, but development should be controlled to ensure a diversified agricultural sector and sustainability of the province's rich forestry resources.
- Cross-border exports of oil palm fruit bunches to Sabah are beneficial to the North Kalimantan economy, but increased processing activities would create more value for the industry.

North Kalimantan's objective in developing cross-border trade and investment with Sabah is to (i) develop cost-savings in the transportation of oil palm fruit bunches to Sabah, and (ii) create cross-border value chains that transfer technology from Sabah's palm oil industry to initially develop upstream production of crude palm oil (CPO), and increasingly move downstream to projects in high value-added palm oil derivatives such as surfactants, agro-chemicals, bio-polyols, bio-lubricants, glycerol derivatives, and bio-based chemicals.

(c) Connectivity

Cross-border trade and investment opportunities in the palm oil industry are, however, limited by the lack of adequate road accessibility between Sabah and North Kalimantan. Lack

[84] Government of North Kalimantan. 2015. North Kalimantan: Trade, Tourism and Investment. Profile and Investment Opportunity of North Kalimantan Province.

of adequate road accessibility means that Sabah's cost, insurance, and freight import price of oil palm fruit is higher than its price with the proposed road. Most benefits from the road construction will be in the form of transport cost savings. Road construction and maintenance therefore needs to examine the cost-savings and increased cross-border shipments resulting from investments in the construction of a carriageway and customs, immigration, quarantine, and security (CIQS) facilities at the border. In the analysis that follows, we focus on the additional supplies of oil palm fruit bunches from North Kalimantan to Sabah palm oil mills and downstream industries that are likely to come onstream as a result of road connectivity between North Kalimantan and Sabah.

As such, the analysis that follows examines two ways by which Sabah and North Kalimantan can benefit from cross-border trade and investment in the palm oil industry:

- Sabah's increased quantity of exports demanded of palm oil and palm kernel from North Kalimantan resulting from lower transportation costs associated with new road construction.
- North Kalimantan's increase in crude palm oil exports resulting from mill construction and processing as part of North Kalimantan–Sabah cross-border palm oil value-chain developments.

19.2 Project Profile

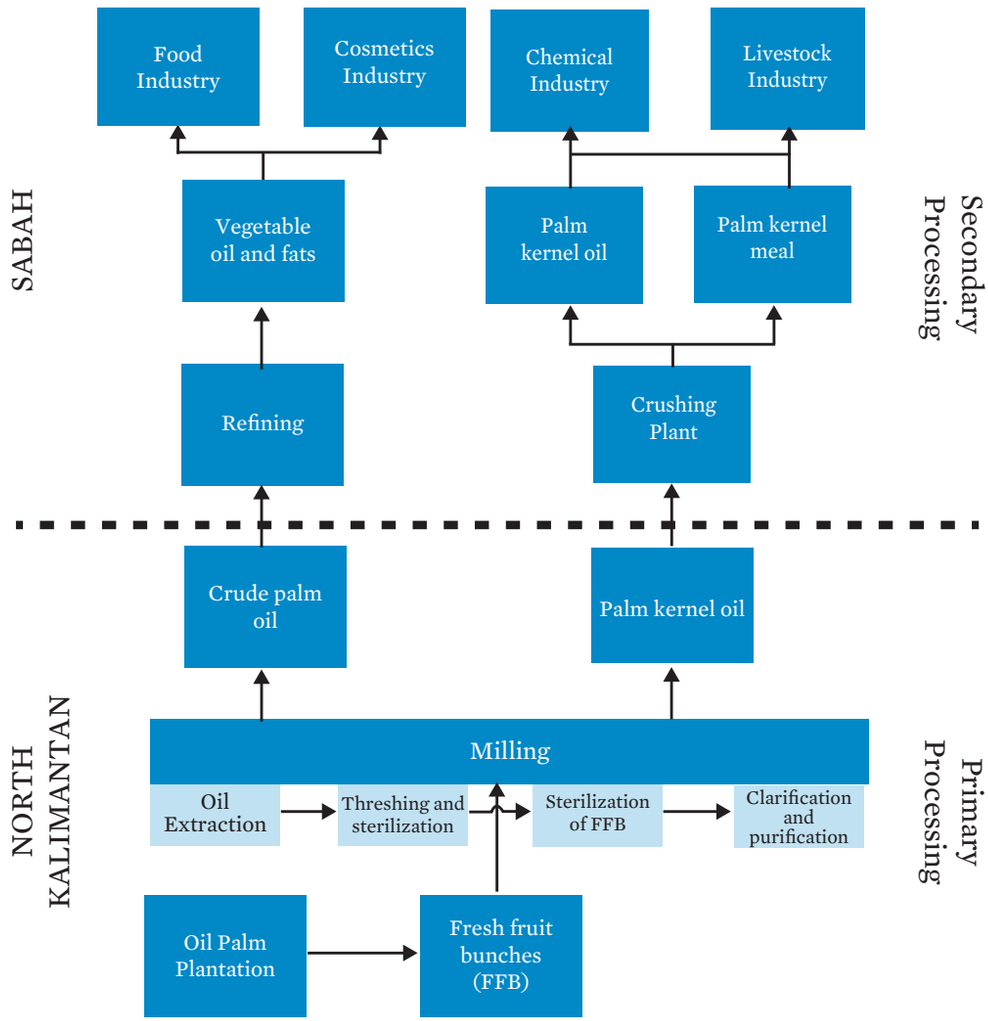
19.2.1 Coverage

The project aims to develop a cross-border value chain between Sabah and North Kalimantan in the palm oil industry. The proposed value chain is shown in Figure 19.1. The primary processing, or upstream stages of production begin at the plantation level and proceed to the milling stage, where the oil extraction, threshing and sterilization, and certification and purification processes take place. There are high margins in the upstream market, which explains the rapid expansion of oil palm plantations and milling processes in the Kalimantan provinces in recent years. Negative environmental consequences of the milling process can be converted in Sabah's new biofuel facilities. In the secondary processing, or upstream stages of production, refining and crushing occur to produce vegetable oils, palm kernel oil, and palm kernel meal. The high value-added phases of secondary production occur at the higher stages of production in food and health-based industries, and the nonfood-based industry related to oleo chemicals and branded products.

19.2.2 Indicative Implementation Arrangements

Start-up will depend on the completion of the road connecting Kalabakan in Sabah to Simenggaris in North Kalimantan. Plans exist to upgrade the road on the Sabah side of the border and build CIQS facilities at the border. Once completed, development of the cross-border value chain for the palm oil industry will require that technical assistance be provided to producers on both sides of the border. Technical assistance will support the operations of champion individuals or institutions to promote the clustering of companies on both sides of the border to initially support development of supply chain arrangements, and later the possible integration of company activities across borders in more formal value chain production and distribution activities.

Figure 19.1. Cross-Border Value Chain in the Palm Oil Industry



Source: Representation by the authors.

19.2.3 Project Management

The project will be managed by a project steering committee (PSC) for palm oil cross-border value chain, composed equally of public and private sector representatives. In North Kalimantan, the Office of the Governor will be the coordinating agency. In Sabah, the Economic Planning Unit will be the focal agency. In addition to guiding project implementation, the PSC will also be responsible for monitoring and evaluating the project.

19.3 Analysis

19.3.1 Transport Costs

Transport costs from farm-gate to mill-gate of the oil palm fresh fruit bunches (FFB) normally represent about 10% of the farm-gate price.[85] Without an adequate roadway to Malaysia, North Kalimantan farmers need to truck the fruit to seaports, load it onto barges for shipment to Tawau or Lahad Datu, and then load it onto trucks for transport to mills. According to plantation managers in North Kalimantan interviewed by the authors of this study, the indirect sea route can add 10 or more percentage points to the farm-gate price of the fresh fruit bunch. Transport cost is consequently the single most crucial factor affecting the competitiveness of North Kalimantan oil palm producers. Construction of a paved road in the town of Simanggaris to the border crossing and then from Kalabakan on the Sabah side of the border to the town of Serudong in Tawau District would substantially reduce transport costs between North Kalimantan and Sabah.

In the production process, FFBs are produced by oil palm trees, which are then processed in palm oil mills to produce CPO and palm kernel (Figure 19.2). Palm oil comes from palm fruit, while palm kernel oil is extracted from palm seed. Palm oil derivatives are then made from the CPO and palm kernel (for CPO derivatives process, see Figure 19.3).

The following are critical measures in the cost–benefit analysis related to production:[86]

(a) *Extraction Rates*:
- Extraction rate to convert oil palm FFB to CPO is 21%, that is, it takes 100 kilograms (kg) of FFB to produce 21 kg of CPO; and
- Extraction rate to convert oil palm FFB to palm kernel oil (PKO) is 5%, that is, it takes 100 kg of FFB to produce 5 kg of PKO.

(b) *Cost of Production:*
- Cost of production for CPO is RM1,580 a metric ton; and
- Cost of production for PKO is RM324 a metric ton.

Market prices of oil palm FFB, CPO, and PKO in Sabah are reported by the Economics and Industry Development Division of the Government of Malaysia.[87]

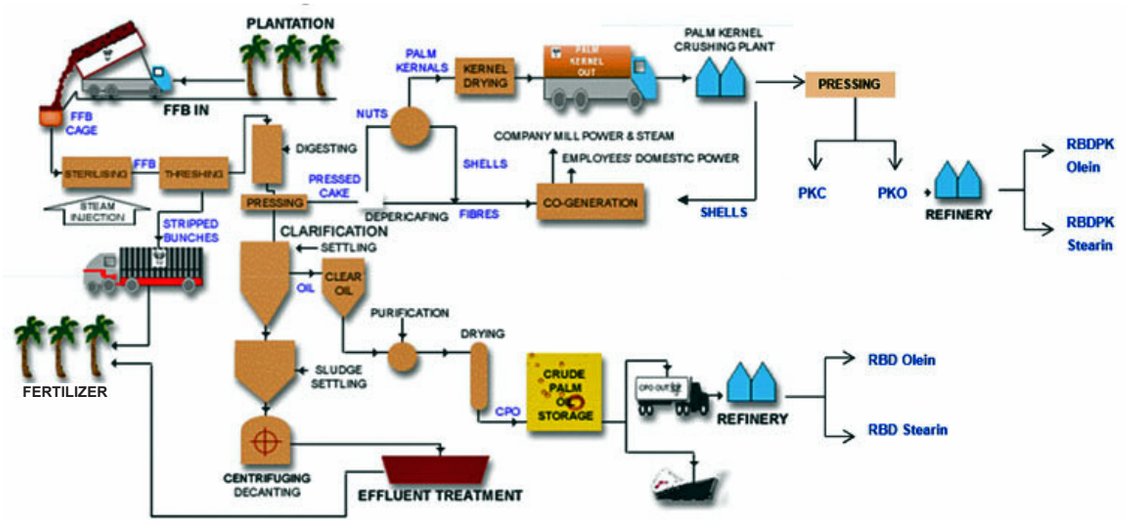
North Kalimantan oil palm producers are planning to construct oil palm mills, in many cases as part of their cross-border value-chain arrangements with investors from Sabah. We assume that the mills will have sufficient capacity to process half of the FFB currently directed to East Kalimantan for processing in that state, and that the resulting CPO and PKO will be redirected to Sabah palm oil derivative producers. The implied oil palm FFB processing capacity of the mills would therefore be 4,500 tons of CPO a year and 250 tons of PKO a year, requiring a combined capital expenditure of $2.4 million.

[85] T. Anderson. 2006. Oil palm and small farmers in Papua New Guinea. Report for the Centre for Environmental Law and Community Rights on the Economic Prospects for Small Farmers in PNG's Oil Palm Industry. May. https://np-net.pbworks.com/f/Anderson+(2006)+Oil+palm+and+small+farmers+in+PNG,+CELCR. pdf.

[86] Extraction rates and production costs are from S. Bahri. 2016. Oil Palm by Product: How to Compute Its Cost of Production. *IOSR Journal of Business and Management*. 18 (10). October.

[87] Online at http://bepi.mpob.gov.my/admin2/daily.php.

Figure 19.2. Crude Palm Oil Milling Process



FFB = fresh fruit bunches, PKO = palm kernel oil, PKC = palm kernel cake, RBD = refined bleached deodorized, RBDPK = refined bleached deodorized palm kernel oil.
Source: Palm Oil Mills. Crude Palm Oil Production Process. http://www.palmoilmills.org/products/crude-palm -oil-mill/crude-palm-oil-production-process.html.

19.3.2 Road Construction

North Kalimantan – On the North Kalimantan side, the road connects the town of Simanggaris to the border crossing, and construction is to be completed in 2018 with financing from ADB's Regional Roads Development Project (ADB Loan 2817-INO). North Kalimantan's capital expenditures for road construction are calculated as the proportion of the road from Simanggaris to the border relative to the total of 476 kilometers of road construction being financed by the overall $245 million loan.

Construction costs on the Malaysian side of the border do not affect the project evaluation for North Kalimantan, and completion of the existing road on the North Kalimantan side is a sunken cost. However, road maintenance on the North Kalimantan side is critical to the success of the road as a means of transporting heavy trucks between the province and Sabah. The existing road network through North Kalimantan is already damaged from heavy truck traffic carrying oil palm FFB and logs. The current cost estimates allocate 3% of the total capital expenditures for construction of the road to annual maintenance. Unless there are strict restrictions placed on weights on loads, there is likely to be further road damage in the future.

The overall cost estimates include $2.0 million of total capital expenditures for annual road maintenance. While other road projects may have lower operating costs with periodic maintenance every 4 to 5 years, the current maintenance costs are higher and more recurrent because of the road damage caused by heavy trucks carrying FFB and timber from North Kalimantan to Sabah. These higher costs produce more conservative estimates of the project's net benefits.

Sabah – On the Sabah side, construction of the Kalabakan–Serudong road in Tawau District of Sabah is estimated to cost $160 million for the paved road and a CIQ facility at the border. The approximate length of the road would be 45 kilometers. Currently there is gravel and earth road, which makes the border impassable during the rainy season. The plan is to upgrade the existing road to a single carriageway and later convert it to a dual carriageway. If approved, road construction in Sabah would take place in 2018–2019, and be ready for use in 2020. Maintenance for the new road on the Sabah side of the border will also be a vital component of the project.

Figure 19.3. Palm Oil Derivatives

IE = interesterification, RBD = refined bleached deodorized.
Source: Palm Oil Mills. Crude Palm Oil Production Process. http://www.palmoilmills.org/products/crude-palm-oil-mill/crude-palm-oil-production-process.html.

19.3.3 Benefits Analysis

There are two direct benefits from the construction of the road from North Kalimantan to Sabah palm oil producers:

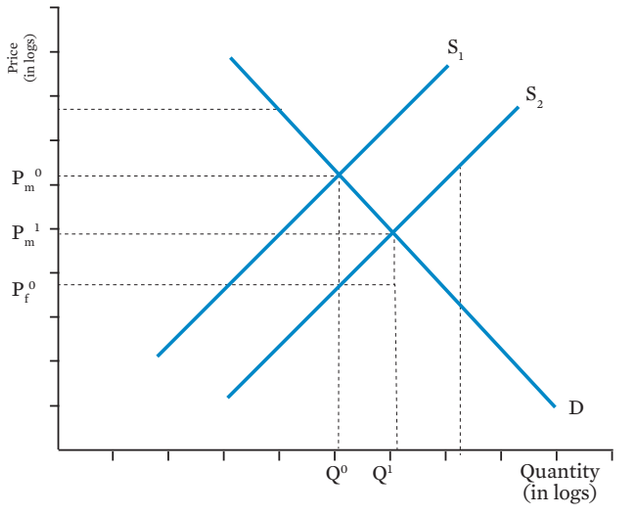
- An increase in the quantity demanded of oil palm FFB and semi-processed products because of lower transport costs from a more direct route between North Kalimantan and Sabah; and
- An increase in the share of total oil palm FFB and semi-processed production in North Kalimantan channeled to Sabah because of better market access than before. For North Kalimantan, it represents a shift from FFB exports to CPO and PKO exports as a result of the promulgation of cross-border value chains and increased investment and technology transfers from the Sabah palm oil industry.

Each of these benefits are examined separately in the remainder of this section.

(a) Lower Transport Costs

The first benefit is illustrated in Figure 19.4. The farm-gate price is P_f^0 and the initial mill-gate price is P_m^0. The difference between the farm-gate price and mill-gate price represents transport and insurance. At P_m^0, Sabah-based mills will demand Q_m^0 of North Kalimantan's oil palm FFB production. With Sabah's construction of the dual carriageway road to the North Kalimantan border, transport and insurance costs will fall and the new mill-gate price is P_m^0. At that price, the quantity of oil palm FFB demanded will increase from Q_m^0 to Q_m^1 (a movement along the demand curve).

Figure 19.4. Change in Quantity Demanded of Crude Palm Oil and Palm Kernel due to Lower Transportation Costs



Source: Elaborated by the authors.

Estimates of the price elasticity of demand for imports from the palm oil sector vary greatly.[88] While several authors have estimated price-inelastic demand curves for Indonesia's exports, other estimates have calculated the price elasticity of import demand for the palm oil sector as high as –2.28.[89] In the present report, we use the –1.66 averages of the estimates.

On the supply side, scholars have suggested that the long gestation period of the oil palm gives rise to a highly price-inelastic supply curve, both in the short and long run. However, in North Kalimantan, the plantations visited by the authors of this study indicated their ability to bring in new supplies within a relatively brief period because of their large tracts of unplanted lands and stocks of seedlings (see Figure 19.4). Indeed, one study has found the own-price elasticity of supply of palm oil to be 1.65 (footnote 89). In the present study, the slope of the supply curve is inconsequential to the results. The same results hold, whether the supply of FFB is completely price inelastic or not.

Calculation of the benefits to North Kalimantan oil palm exporters is straightforward. The change in earnings from the road construction will be new price-quantity product less the old price-quantity product, that is, $(P_m^1 * Q^1) - (P_m^0 * Q^0)$ in Figure 19.4.

To calculate the benefits to Sabah, we need to determine the additional palm oil and palm kernel that will be produced from the increase in FFB supplies originating in North Kalimantan. The net benefits will be the additional revenue less the cost of purchasing the additional FFB supplies and other costs related to labor and capital expenditures needed to produce the additional output. Following conventional procedures, we have used an extraction rate of 4:1 to convert oil palm FFB to CPO; and, for PKO, an extraction rate of 20:1.[90]

[88] For a review, see A. Abdullah. 2012. The Economic and Environmental Analysis of Palm Oil Expansion in Indonesia: Export Demand Approach and EIRSAM Model. Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in International Development, Graduate School of International Development, Nagoya University. March.

[89] S. Hirankitrangsee. 1987. Demand and Supply Analysis of Palm Oil in Thailand. MSc thesis. Kasetsart University, Bangkok.

[90] These extraction rates are under ideal conditions, according to Food and Agriculture Organization of the United Nations (FAO). Undated. Small-Scale Farm Processing in Africa. Agricultural Services Bulletin 148. Rome. In practice, however, the extraction rate is somewhat lower for smallholding estates, namely, a CPO from FFB extraction rate of 22.66%, while palm kernel to palm kernel oil (PKO) has an extraction rate of 5.27% (See D. Burnett and D. Ellingsen. 2001. Review of the Oil Palm Fresh Fruit Bunch Pricing Formula. Final Report prepared for the Commodities Working Group of the Government of PNG, National Resources Institute and ADS (PNG). Port Moresby. November).

(b) Larger Share of Exports Channeled to Sabah

The second benefit derives from an increase in the share of total oil palm FFB and semi-processed production in North Kalimantan channeled to Sabah because of better market access than before. This calculation is not straightforward. While crude palm oil and its fractions (HS 151110) and palm kernel oil (HS 151321) are directed to Sabah, a sizeable proportion of oil palm FFB produced in Malinau and Bulungan regencies of North Kalimantan are trucked to mills in East Kalimantan and then exported. Unfortunately, statistical information on those volumes is unavailable.

Figure 19.5. Oil Palm Plantation with Fresh Fruit Bunches Being Trucked, Seedlings Being Cultivated, and Oil Palms in Background

Source: Photo by the authors.

Therefore, there is a need to use estimates from interviews conducted with plantation managers that at least one-half of North Kalimantan's production of FFB is directed to East Kalimantan and that no less than one-third of those supplies would likely be redirected to Sabah once the dual carriageway road is constructed (Figure 19.5). These assumptions should be validated in the full feasibility study.

19.4 Internal Rate of Return for Sabah

Common assumptions underlying the economic analysis are as follows: (i) capital investments take place in 2018–2019 and operating expenses are spread evenly across the project evaluation period; (ii) the proportion of tradable inputs in capital and operating expenditures is one-third of the total, and a standard conversion factor of 1.08 is applied to tradables; (iii) project benefits accrue through 2047; and (iv) a discount rate of 9% is used to calculate the economic net present value (ENPV).

The base-case economic internal rate of return (EIRR) calculation for Sabah's palm oil industry is presented in Table 19.1.[91] The EIRR for the palm oil industry in Sabah is computed at 18%. These estimated benefits are considered conservative because the additional share of total North Kalimantan production shifted from the East Kalimantan channel markets to Sabah is only 16.7%, and the actual share is likely to be significantly higher. The net present value, which is calculated as the difference between the present value of cash inflows and outflows, discounted at 9%, is equal to just over $114 million measured in 2016 prices over the 30-year period of analysis.

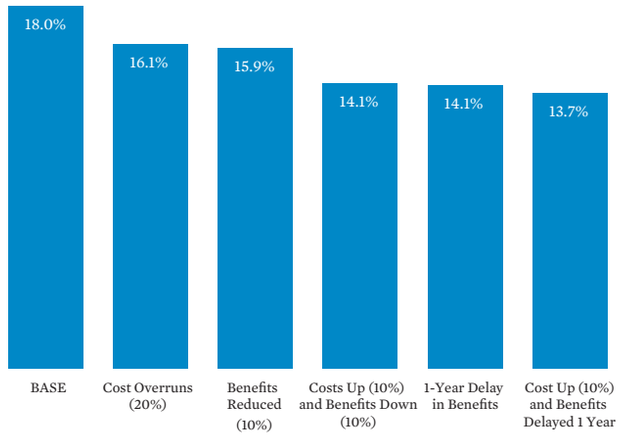
[91] The internal rate of return on an investment or project is the "annualized effective compounded return rate" or rate of return that sets the net present value of all cash flows (both positive and negative) from the investment equal to zero. When externalities and price distortion are allowed for in the cost and benefit stream, the social criteria are the same, i.e., net present value and internal rate of return, generally called economic internal rate of return (EIRR) to distinguish it from financial internal rate of return.

Table 19.1 Summary of Economic Internal Rate of Return and Sensitivity Analysis for Sabah's Palm Oil Industry

	Economic Internal Rate of Return	Economic Net Present Value at 9% ($ million)	Economic Benefit–Cost Ratio
Base Estimate	18.0%	114.3	1.68
Cost Overrun of 20%	16.1%	97.4	1.52
Benefits Reduced by 10%	15.9%	86.0	0.87
Costs Increased by 20% and Benefits Reduced by 10%	14.1%	69.1	1.13
One-Year Delay in Program Start-up, with Benefits Delayed by 1 Year	14.1%	61.3	1.13
Cost Overrun by 20% and Benefits Delayed by 1 Year	13.7%	71.2	1.12

Source: Calculations by the authors.

Figure 19.6. Economic Internal Rate of Return for Sabah's Palm Oil Industry under Alternative Scenarios



Source: Calculations by the authors.

The economic benefit–cost ratio (EBCR) is the ratio of the benefits relative to their monetary costs. Since the general rule-of-thumb is that benefits that exceed costs indicate a worthwhile investment, the 1.7 ratio suggests a robust investment for the industry in general. Table 19.1 also presents the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows that Sabah's palm oil industry trade and investments following the road construction generally remain economically viable in the face of various project shortfalls during the period of analysis (Figure 19.6).

Technical assistance needs are estimated at $2.0 million–3.0 million. Capacity development will focus on the following components:

(a) Support the operations of champion individuals or institutions to promote the clustering of companies on both sides of the border to initially support development of supply chain arrangements; and
(b) Possibly integrate company activities across borders in more formal value-chain production and distribution activities.

19.5 Internal Rate of Return for North Kalimantan

Common assumptions are the same as those for Sabah. The base-case EIRR calculation for North Kalimantan's palm oil industry is presented in Table 19.2. The EIRR for the palm oil

Table 19.2 Summary of Economic Internal Rate of Return and Sensitivity Analysis for North Kalimantan's Palm Oil Industry

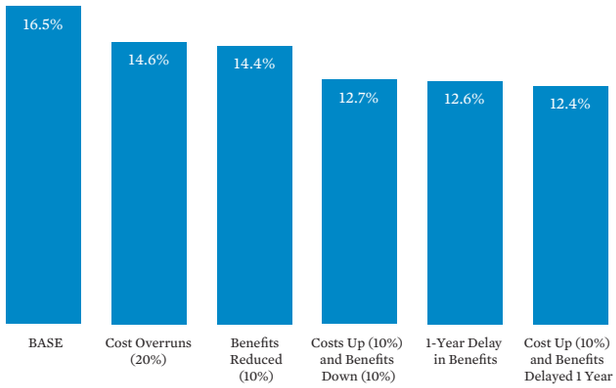
	Economic Internal Rate of Return	Economic Net Present Value at 9% ($ million)	Economic Benefit–Cost Ratio
Base Estimate	16.5%	29.2	1.52
Cost Overrun of 20%	14.6%	23.6	1.38
Benefits Reduced by 10%	14.4%	20.6	1.37
Costs Increased by 20% and Benefits Reduced by 10%	12.7%	15.0	1.24
One-Year Delay in Program Start-up, with Benefits Delayed by 1 Year	12.6%	13.2	1.23
Cost Overrun by 20% and Benefits Delayed by 1 Year	12.4%	15.6	1.25

Source: Calculations by the authors.

industry in North Kalimantan is computed at 16.5%. Again, this return reflects a conservative estimate because the additional share of total North Kalimantan production shifts from the East Kalimantan channel markets to Sabah is only 16.7%, while the actual share is likely to be significantly larger. The net present value (i.e., the difference between the present value of cash inflows and outflows, discounted at 9%) is equal to only over $29 million measured in 2016 prices over the 30-year period of analysis.

The EBCR is the ratio of the benefits relative to their monetary costs. Since the general rule-of-thumb is that benefits that exceed costs indicate a worthwhile investment, the 1.5 ratio suggests a robust investment for the industry in general.

Figure 19.7. Economic Internal Rate of Return for Palm Oil Industry under Alternative Scenarios



Source: Calculations by the authors.

Table 19.2 also presents the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows that North Kalimantan's palm oil industry benefits generally remain economically viable in the face of various shortfalls in the project's implementation during the period of analysis (Figure 19.7).

19.6 Capacity Building

Technical assistance needs are estimated at $2.0 million–$3.0 million. Capacity development will focus on the following components:

(a) Support the operations of champion individuals or institutions to promote the clustering of companies on both sides of the border to initially support development of supply-chain arrangements; and
(b) Possibly integrate company activities across borders in more formal value-chain production and distribution activities.

20

Wood Products

20.1 Rationale

The wood-based industry in both North Kalimantan and Sabah comprises four major subsectors: (i) sawn timber; (ii) veneer and panel products, which include plywood and reconstituted panel products such as particleboard, chipboard, fiberboard, moldings, and builders' joinery; (iii) carpentry for doors and windows along with panels and flooring board/parquet; and (iv) furniture and furniture components.

• *North Kalimantan*

Wood processors in North Kalimantan have expressed interest in diversifying their production to include furniture manufacturing, similar to those in Sabah. Development of cross-border clusters of wood manufacturers therefore offers North Kalimantan companies an opportunity to develop downstream activities and add value to their products. For collaboration to occur, however, North Kalimantan timber producers need to ensure that their logs have global certifications from either the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification, similar to the certification held by most Sabah companies. The advantage of the certification, in addition to offering cross-border collaborative opportunities, is that certified logs are valued by as much as 77% more than noncertified logs. Additionally, FSC certification adds a 100% premium on the price of timber.[92]

• *Sabah*

Most of Malaysia's larger sawmills, veneer, and plywood mills are located in Sabah as well as Sarawak. The mills use tropical wood species to produce sawn timber, veneer, plywood, and other veneered panel products. More than 55% of the plywood mills and 45% of the molding mills are located in Sabah and Sarawak.[93] They are predominantly owned by Malaysians operating small and medium-sized enterprises (SMEs).

Malaysian furniture manufacturers produce a wide range of furniture from office, kitchen, bedroom, dining room, living room, upholstered furniture/sofa, and outdoor and garden furniture. Furniture is made from not only wood, but also all types of materials such as rattan, metal, fabrics, plastic, glass, marble, and other composite materials. The furniture manufacturers are located mainly in Johor, Selangor, Sarawak, Perak, and Melaka.

[92] W. Kollert and P. Lagan. 2007. Do Certified Tropical Logs Fetch a Market Premium?: A Comparative Price Analysis from Sabah, Malaysia. *Forest Policy and Economics*. 9 (7). pp. 862–868.

[93] Malaysian Investment Development Association. Food Technology and Sustainable Resources. http://www.mida.gov.my/home/food-technology-and-sustainable-resources/posts/.

Malaysia's regulatory barriers in the wood processing industry are fragmented. Sabah, Sarawak, and Peninsular Malaysia each has its own regulatory authority. Sabah has a large number of companies producing wood products with global certifications from both the FSC and the Programme for the Endorsement of Forest Certification, which addresses sustainable management of forestry resources. Certified logs in Sabah are valued by as much as 77% more than noncertified logs. Additionally, FSC certification adds a 100% premium on Sabah's price of timber.[94] The Sabah Timber Industries Association is the leading wood products organization in Sabah, and it maintains information on key exporting companies in the state, along with the value of exports of each of those companies.

20.2 Motivation

(a) Sabah

The Sabah Structure Plan 2033 (SSP2033) identifies wood-based products as one of the leading manufacturing operations for government to encourage and promote greater export value, skilled labor, and technical and vocational education and training (TVET) support. Sabah already has 135 diploma and degree graduates in wood-based and forestry specialties.[95] Within Sabah's overall wood-products production system (Figure 20.1), the major subsector being promoted is furniture, where the state government sees *huge potential for downstream activities* (SSP2033, Section 10–13). To that end, the state government is promoting more value-added processing and centralizing the distribution system. "Material City" is to centralize purchasing of raw materials, while "Home Ideas Centre" is to be a center for the display of housing timber products, and a design center for creative development of downstream activities for Sabah's forestry industry.

Nearly 20% of Malaysia's veneer and plywood mills are located in Sabah, making it the state with the largest number of mills. They use tropical wood species for the production of sawn timber, veneer, plywood, and other veneered panel products. Downstream processing mills are mainly located in Peninsular Malaysia. They mainly use rubberwood sourced from sustainable plantations and produce fiberboard, furniture, and builders' joinery and carpentry such as doors, windows, and window frames.

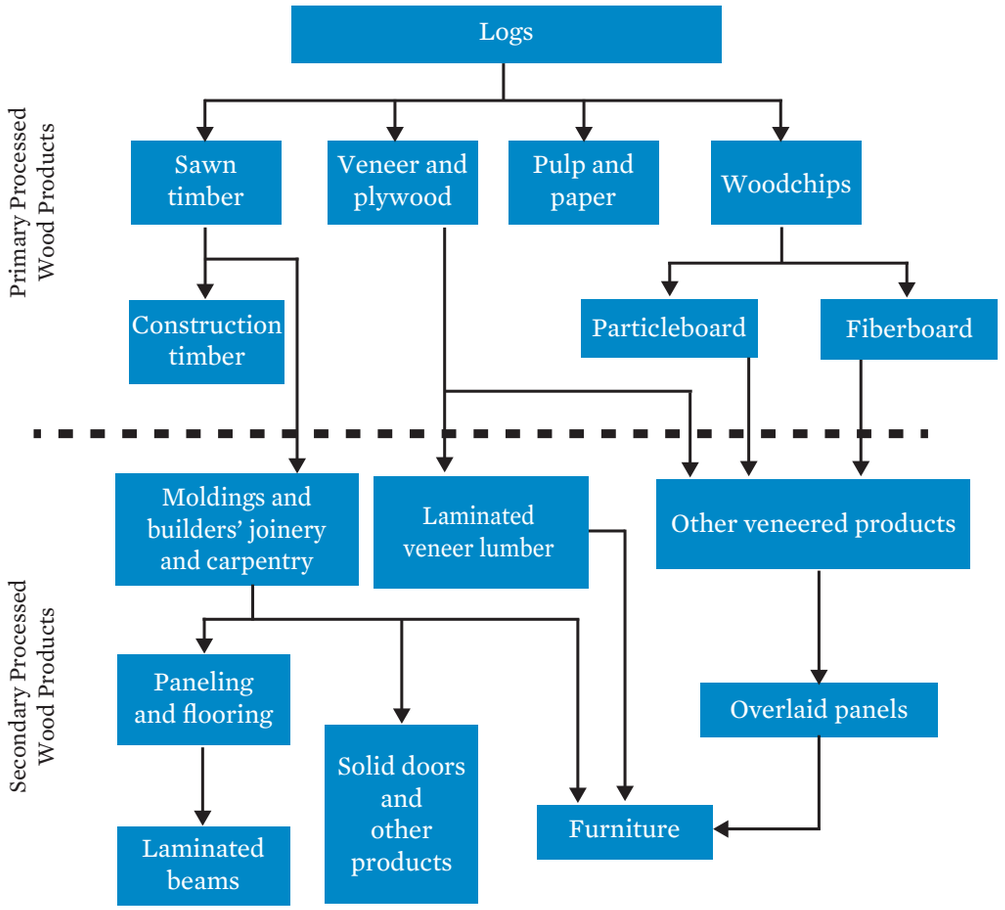
Malaysia's furniture industry is highly export-oriented, with over 90% of its production exported. Malaysia is the ninth largest exporter of furniture in the world. Among the furniture exported are kitchen furniture, bedroom furniture, upholstered with wooden frame and office furniture. Exports of garden and outdoor furniture from tropical hardwood is mainly for the European market. The solid tropical wood species used are known for their durability under different climatic conditions. Besides traditional markets, Malaysian furniture has gained access to the markets in New Zealand, South America, Middle East, Africa, and the Russian Federation.

Malaysian furniture manufacturers have given greater emphasis on the finishing, design, and production of higher quality products with own-brand mostly for the export market.

[94] W. Kollert and P. Lagan. 2007. Do Certified Tropical Logs Fetch a Market Premium?: A Comparative Price Analysis from Sabah, Malaysia. *Forest Policy and Economics*. 9 (7). pp. 862–868.

[95] Malaysian Timber Industry Board. Local Workforce in the Timber and Furniture Industries in Malaysia. http://www.mtib.gov.my/index.php?option=com_content&view=article&id=1949%3Alocal-workforce-in-the-timber-and-furniture&catid=43%3Aselected-news&lang=en.

Figure 20.1. Sabah's Wood Products Production Process



Source: NEPCon. 2016. Supply Chain Mapping of Malaysian Timber and Wood-Based Industries. Denmark. http://awsassets.wwf.org.my/downloads/final_supply_chain_mapping_report_18jan16.pdf.

Some of these companies have moved from supplying ready-to-assemble furniture toward manufacturing own-designed furniture.[96] Furniture manufacturers produce a wide range of furniture from office, kitchen, bedroom, dining room, living room, upholstered furniture/sofa, and outdoor and garden furniture. Furniture is made from not only wood, but also all types of materials such as rattan, metal, fabrics, plastic, glass, marble, and other composite materials. The furniture manufacturers are located mainly in Johor, Selangor, Sarawak, Perak, and Melaka.

Before 2000, Sabah's forestry sector contributed nearly half of the state's total gross domestic product (GDP). As a result, as much as 80% of the forest area was heavily impacted by commercial harvesting operations. Deforestation and degradation of forests was driven by the expansion of oil palm and rubber plantations, as well as timber harvesting and commercial

[96] Ministry of International Trade and Industry. Wood Based Industry. http://www.miti.gov.my/index .php/pages/view/2443.

tree plantations for timber and production of wood products.[97] While forestry has declined in relative importance, Sabah still exports massive quantities, roughly 2 million cubic meters a year of unprocessed and semi-processed timber products. In light of Sabah's depleted timber stocks, the Sabah Timber Industries Association has urged the state government to impose a ban on log exports so that all timber resources can be utilized by the local wood-processing industry.[98] For several years now, Sabah has experienced a shortage of log supplies in the wood-based industry. Since the implementation of the Sustainable Forest Management Policy in the 1990s to conserve and protect the forest resources, the continuous shortage of raw material supplies is affecting the ability of the industry to implement downstream processing.

Not only are there local market shortages, but in the export markets producers must comply with requirements about the legality of timber. Japan, which is by far Sabah's major export market for forestry products, enacted new legislation in May 2016 under the "Law Concerning the Promotion of Distribution and Use of Legally-Harvested Timber."[99] It is designed to promote the trade of legal timber, and it represents the beginning of Japan's effort to follow the growing trend of implementing measures to prevent imports of illegal timber. Other major markets focus on the elimination of illegal timber. For example, in Europe, producers need to comply with the 2013 EU Timber Regulation; in the United States market, exports are subject to the Lacey Act; and, in Australia, exports must comply with the 2014 Australia Illegal Logging Prohibition Act.

Nearly all timber originates from permanent forest reserves, of which over 60% is allocated for harvesting to supply timber and other forest products. Stocks are currently depleted, however, and they need to be built up again through forest management measures. As such, it is important that the wood-based industry find other timber sources. As stated in the SSP2033, *The supply of timber resources will continue to dwindle for the next 20 years; to remain competitive, timber companies need to resort to drastic structural change such as importing raw materials, utilizing plantation timber, moving further downstream to focus on value and not volume and to grow their own tree plantations.*[100]

Expansion of Sabah's wood-based products without further depleting forests can be accomplished by sourcing greater amounts of wood from North Kalimantan. North Kalimantan has an abundance of raw materials that are shipped to markets with relatively limited processing. Plywood is one of the major industries and quality standards are high. Thus, there is ample opportunity for expanding the wood product industry into premium furniture and linking those value-adding activities to Sabah's large and growing wood-based industry.

(b) North Kalimantan

North Kalimantan has an abundance of timber that is shipped to markets with relatively limited processing. Plywood and veneer are currently the major wood processing industries

[97] A. Hoare. 2015. Illegal Logging and Related Trade. The Response in Malaysia. Research Paper. London: Chatham House.

[98] *Daily Express*. 2015. STIA calls for a total ban on the export of logs. 2 July. http://dailyexpress.com.my/news.cfm?NewsID=101124.

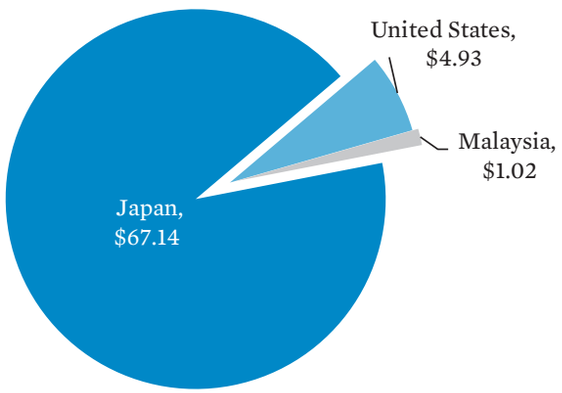
[99] M. Momii. 2016. Japan's New Legal Timber Law. *Forestry Legality Initiative*. 5 December. http://www.forestlegality.org/blog/japan%E2%80%99s-new-legal-timber-law.

[100] Town and Regional Planning Department Sabah. 2016. *Sabah Structure Plan 2033*. Section 10–13. Kota Kinabalu, Sabah.

and quality standards are high. The industry is therefore exclusively involved in primary processed wood products (Figure 20.2). There is ample opportunity for expanding the wood product industry into premium furniture, builders' joinery and carpentry, laminated veneer lumber, paneling, and flooring. The industry could link those value-adding activities to Sabah's large and growing wood-based industry since companies are anxious to develop cross-border value chains with North Kalimantan.

Veneer and plywood mills are located in Tarakan. They use tropical wood species to produce sawn timber, veneer, plywood, and other veneered panel products. There are currently no downstream processing mills for the production of fiberboard and furniture, and builders' joinery and carpentry such as doors, windows, and window frames.

Figure 20.2. North Kalimantan's Official Wood-Product Exports by Major Destination, 2015
($ million)



Source: NEPCon. 2016. Supply Chain Mapping of Malaysian Timber and Wood-Based Industries. Denmark. http://awsassets.wwf.org.my/downloads/final_supply_chain_mapping_report_18jan16.pdf.

Nearly 50% of North Kalimantan's official wood and wood-product exports consist of continuously shaped hardwood, while almost all of the remaining wood-product exports consist of veneer and plywood. Of the total of those exports, 92% are directed to Japan, and another 6.7% are destined for the United States (Figure 20.2). Malaysia only absorbs 1.4% of wood-product exports in the form of plywood and veneer panels. There are also some minor exports of plywood and veneer panels to Australia; Austria; Belgium; Cambodia; the People's Republic of China; Denmark; France; Germany; Hong Kong, China; India; Italy; Jordan; the Republic of Korea; the Netherlands; New Zealand; Poland; Saudi Arabia; Singapore; South Africa; Taipei,China; and the United Kingdom.

In upstream activities, there are opportunities for North Kalimantan to supply Sabah with much-needed timber. Before 2000, Sabah's forestry sector contributed nearly half of the state's total GDP. As a result, as much as 80% of the forest area was heavily impacted by commercial harvesting operations. Deforestation and degradation of forests was driven by the expansion of oil palm and rubber plantations, as well as timber harvesting and commercial tree plantations for timber and production of wood products.[101] While forestry has declined in relative importance, Sabah still exports massive quantities, roughly 2 million cubic meters a year of unprocessed and semi-processed timber products.

Since there are no customs, immigration, and quarantine (CIQ) facilities along the North Kalimantan–Sabah border, there is a large volume of timber exported unofficially through dirt and gravel roads. It is estimated that 1.0 million cubic meters of timber cross into Sabah each year through these roads.[102] Once they reach Sabah, the timber is measured and a certificate

[101] A. Hoare. 2015. Illegal Logging and Related Trade. The Response in Malaysia. Research Paper. London: Chatham House.

[102] Australia Broadcasting Corporation. The Timber Mafia. http://www.abc.net.au/4corners /content/2002/timber_mafia/webextras/map/flash_map.htm.

of origin issued, along with related documentation. If North Kalimantan could transform the large volume of unofficial exports of timber into legally harvested timber that were officially registered, the results would greatly impact on the province's GDP.

In order to legalize that unofficial trade, North Kalimantan would need to comply with requirements about the legality of its timber to its major export markets. Japan has recently enacted new legislation under the "Law Concerning the Promotion of Distribution and Use of Legally-Harvested Timber."[103] It is designed to promote the trade of legal timber, and it represents the beginning of Japan's effort to follow the growing trend of implementing measures to prevent imports of illegal timber. In Europe, producers need to comply with the 2013 EU Timber Regulation; in the United States market, exports are subject to the Lacey Act; and, in Australia, exports must comply with the 2014 Australia Illegal Logging Prohibition Act.

There are ample opportunities to expand North Kalimantan's official wood and wood-based products to Sabah. North Kalimantan has an abundance of raw materials that are shipped to markets with relatively little processing. Enforcement of timber harvesting and certification documentation procedures would go a long way to eradicating illegal trade and halting deforestation. Creating a legal and regulatory framework to manage sustainably North Kalimantan's forests would have pronounced positive effects on North Kalimantan's GDP growth. Part of that transformation could focus on expanding into premium processed wood products like furniture, where Indonesia already has abundant skilled labor, and linking those value-adding activities to Sabah's large and growing wood-based industry. Already, North Kalimantan wood manufacturing company managers interviewed during the field trip for this study expressed strong interest in bolstering their carpentry products and developing premium branded furniture, which could be linked with cross-border value chains.

These opportunities are, however, currently limited by the lack of adequate road accessibility between North Kalimantan and Sabah. Road construction and maintenance are therefore needed to initially promote formal cross-border trade and move North Kalimantan's industry into the production of secondary processed wood products. In the analysis that follows, we focus on the potential additional supplies of primary processed wood products from North Kalimantan to Sabah's secondary processed wood product industries. Development of cross-border value chains to promote downstream activities in North Kalimantan could also be covered, following the project description in the next section.

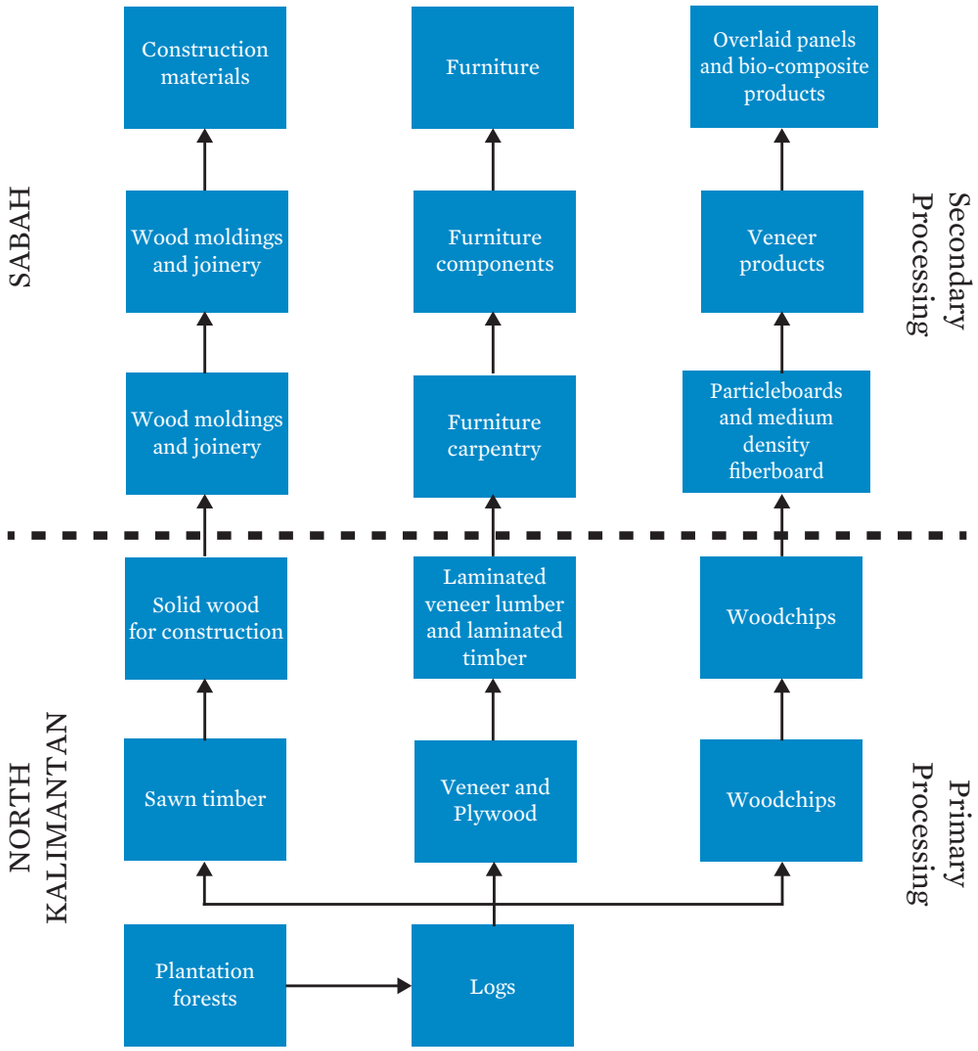
20.3 Cross-Border Value Chain

20.3.1 Project Coverage

The project aims to develop a cross-border value chain between Sabah and North Kalimantan in the wood processing industry. Since North Kalimantan has considerable plantation forests and has developed its primary wood processing industry, Figure 20.3 shows a representation of a cross-border value chain in this industry. With the production of solid woods, laminated timber and veneer, and woodchips on the North Kalimantan side, the project will promote cross-border clustering of company activities. In this way, the project will enable Sabah's processing of wood moldings, furniture carpentry, and particleboards to continue growing

[103] M. Momii. Japan's New Legal Timber Law. *Forestry Legality Initiative*. 5 December 2016. http://www.forestlegality.org/blog/japan%E2%80%99s-new-legal-timber-law.

Figure 20.3. Cross-Border Value Chain in Wood Processing Industry



Source: Prepared by the authors.

to their full potential. It will also promote downstream activities in the areas of furniture, construction materials, and overlay panels and newer bio-composite products that could be directed to markets within Malaysia and outside the country to premium markets in the Middle East, Europe, and the United States.

20.3.2 Implementation Arrangements

Development of the cross-border value chain for the wood processing industry will require that technical assistance be provided to producers on both sides of the border. Technical assistance will support the operations of champion individuals or institutions to enable clustering of companies on both sides of the border to initially support development of supply-chain arrangements, and later the possible integration of company activities across borders

in more formal value-chain production and distribution activities. The technical assistance will also examine the regulatory environment relative to Sabah and North Kalimantan, as well as the world's most successful wood manufacturers like Canada, the United States, Sweden, and Finland.

20.3.3 Project Management

The project will be managed by a project steering committee (PSC) for the wood processing cross-border value chain, composed equally of public and private sector representatives. In North Kalimantan, the Office of the Governor will be the coordinating agency. In Sabah, the Economic Planning Unit will be the focal agency. In addition to guiding project implementation, the PSC will also be responsible for monitoring and evaluating the project.

20.4 Cost Estimates

In the primary stage of production, conventional timber harvesting equipment is expensive and can constitute as much as 40% of the delivered cost of wood.[104] Equipment costs for mechanized conventional systems capable of handling the harvest and recovery of woody biomass need to be combined with operation and maintenance costs, and highly variable transportation costs that are determined based on haul distance, fuel prices, and other factors.[105] Load factor is a cost factor for transportation, with overloading exacerbating the situation. In costing these factors, we use the average cost of tropical high forest harvesting and delivery in Indonesia of $113.5 a cubic meter, valued in 2016 United States dollars.[106] The price of mixed heavy hardwood logs in Malaysia's sawmills is $227 a ton for the average of reporting sawmills in January 2017.[107]

Timber transport costs constitute a sizeable part of the wood-product industry's raw material costs and have a major influence on the sector's overall competitiveness. In fact, depending on fuel costs and haul distance, the transportation of wood from harvest site to processing facility can account for up to 50% of total harvest cost.[108] Developing an efficient timber transport system is therefore essential to the continued success of the industry.

Construction of a paved road from Kalabakan to the border town of Serudong in the Tawau District in Sabah is estimated to cost $160 million for both the road paving and construction of a customs, immigration, and quarantine (CIQ) facility at the border. The approximate length of the road is 45 kilometers. Currently, the road is made up of gravel and earth, making the

[104] Logging unit costs are estimated by dividing machine rates by the production rates for the various logging activities. Logging components normally considered are felling, bucking, skidding, loading, and transport. See FAO. 1992. Estimating Logging Unit Costs. *Cost Control in Forest Harvesting and Road Construction*. Rome. http://www.fao.org/docrep/T0579E/T0579E07.htm.

[105] eXtension. 2014. Cost Factors in Harvesting and Transporting Woody Biomass. February. http://articles.extension.org/pages/70339/cost-factors-in-harvesting-and-transporting-woody-biomass.

[106] See also FAO. 1992. *Cost Control in Forest Harvesting and Road Construction*. Rome. http://www.fao.org/sustainable-forest-management/toolbox/tools/tool-detail/en/c/232649/; and Baker et al. 2013. Regional Cost Analysis and Indices for Conventional Timber Harvesting Operations. Final Report to the Wood Supply Research Institute, University of Georgia. http://wsri.org/resources/media/RegCostAnalFinalRpt.pdf.

[107] Malaysian Timber Industry Board. Timber Prices. http://www.mtib.gov.my/index.php?option=com _content&view=article&id=87&Itemid=88&lang=en.

[108] T. P. McDonald et al. 2001. Information Needs for Increasing Log Transport Efficiency. Precision Forestry Symposium, University of Washington: Seattle, WA. 17–20 June.

border impassable during the rainy season. The plan is to develop the existing road as a single carriageway and later convert it to a dual carriageway. The road will connect to Simanggaris in North Kalimantan, which is being built under ADB's Regional Roads Development Project (ADB Loan 2817-INO). It should be completed in 2018.

Road maintenance is critical to its success as a means of transporting heavy trucks between Sabah and North Kalimantan. The existing road network through North Kalimantan is heavily damaged from heavy truck traffic carrying logs and oil palm fresh fruit bunches (FFB), so maintenance for the new road on the Sabah side of the border will be a vital component of the project. The current cost estimates allocate 3% of the total capital expenditures for construction of the road to annual maintenance.

On the North Kalimantan side, the capital expenditure for road construction is calculated as the proportion of the road from Simanggaris to the border relative to the total of 476 kilometers of road construction being financed by the overall $245 million ADB loan. Construction costs on the Malaysian side of the border do not affect the project evaluation for North Kalimantan, and completion of the existing road on the North Kalimantan side is a sunken cost. However, road maintenance is critical to the success of the road as a means of transporting heavy trucks between North Kalimantan and Sabah. The current cost estimates allocate 3% of the total capital expenditures for construction of the road to annual maintenance.

A simple straight-line (Euclidean) distance measurement provides a rough approximation of the travel costs between two locations, and it is often used in forest management studies. The more accurate measure would network distances along routes, but lack of comprehensive spatial data sets of forest and local roads, especially in North Kalimantan, limits the ability to use road network measurements. We use a conservative estimate for transport costs relying on Euclidean distances between North Kalimantan harvest sites to processing facilities in Sabah that represent about 22% of the timber price when connected through the new road between Kalabakan in Sabah and Simanggaris in North Kalimantan.

20.5 Benefits Analysis

Since CIQ facilities do not exist along the border, there is a large volume of timber exported unofficially through dirt and gravel roads. It is estimated that 1.0 million cubic meters of timber crosses into Sabah each year through these roads.[109] Once they reach Sabah, the timber is measured and a certificate of origin issued, along with other appropriate certifications.

A CIQ facility is planned as part of the construction of the Kalabakan–Serudong road on the Sabah side of the border. It would encourage logs transported across the border to become certified on the North Kalimantan side and to be transported through official channels. According to buyers on the Sabah side, purchase of certified logs reduces transaction costs associated with falsified certificates and registration by as much as 15%.[110] Without the proper certification, timber needs to be sold at about one-fourth of its market price, that is, about

[109] Australia Broadcasting Corporation. The Timber Mafia. http://www.abc.net.au/4corners /content/2002/timber_mafia/webextras/map/flash_map.htm.

[110] L. Tacconi, K. Obidzinski, and F. Agung. 2004. *Learning Lessons to Promote Forest Certification and Control Illegal Logging in Indonesia*. Jakarta: Center for International Forestry Research. http://www.cifor .org/publications/pdf_files/Books/BTacconi0401.pdf.

$55 per cubic meter instead of the benchmark price of $227 per cubic meter in March 2017.[111] Official registration at the border CIQ is cost-effective for both buyers and sellers since it can reduce transactions costs.

Clearly, mark-up costs of falsified certificates and other documentation from unofficial timber vary greatly. In the present analysis, we use a conservative estimate of 10% as the cost-savings on falsified certificates when using official CIQ entry channels into Sabah once the road is constructed.

The analysis further assumes law enforcement certification and registration documents. Otherwise, there is little doubt that financial cost of timber from illegal logging will always be lower and there will be much more remunerative to buyers than the cost of timber from legal logging. In Indonesia, at current prices, the estimated cost to a large forest concessionaire to deliver legal wood that includes "informal" taxes of 20% to the mill is $113.5 a cubic meter. In contrast, the cost of illegal timber is only $43 a cubic meter. For a small concessionaire holder, the cost is $61 a cubic meter to deliver wood to the mill, whereas it only costs a small-scale illegal harvesting operation $7 a cubic meter to deliver wood to the roadside.[112]

Caution needs to be used when interpreting the benefit calculations in this section. Nonetheless, the greater the policing of illegal timber and enforcement of the verification process in Sabah's wood processing industry, the more likely it is that the results of the analysis will hold.

To calculate the change in quantity demanded by Sabah of timber originating in North Kalimantan, we use the average of estimates from various authors.[113] For sawn timber, the average elasticity of demand is –1.35, which contrasts with an average elasticity of demand for plywood of –1.48. The former is applicable to timber that would be transported on the new road between Sabah and North Kalimantan, and the latter is applicable to exports of veneer and plywood transported by ships from Tarakan.

The benefits for North Kalimantan's wood and wood processing industry are substantial since unofficial exports would become official exports and therefore have a positive effect on the province's GDP. In contrast, for Sabah, the benefits for its wood processing industry from construction of the CIQ facility and road are relatively small, even under the most optimistic assumptions. The main benefits for Sabah would be qualitative rather than quantitative, as falsified certifications and documentations of timber supplies to mills would become legally certified documents and therefore help to promote the industry's exports in markets having strict compliance regulations against illegally harvested timber.

[111] J. Newman and S. Lawson. 2005. *The Last Frontier: Illegal Logging in Papua New Guinea and China's Massive Timber Theft*. London: Environmental Investigation Agency and Telepak. https://s3.amazonaws .com/environmental-investigation-agency/posts/documents/000/000/413/original/The_Last_Frontier .pdf?1468421007.

[112] Adjusted to 2016 US dollar values, based on information in L. Tacconi, K. Obidzinski, and F. Agung. 2004. *Learning Lessons to Promote Forest Certification and Control Illegal Logging in Indonesia*. Jakarta: Center for International Forestry Research. http://www.cifor .org/publications/pdf_files/Books/BTacconi0401.pdf.

[113] FAO. Forest Products Marketing and Trade. http://www.fao.org/docrep/w4388e/w4388e0k.htm.

20.6 Internal Rate of Return of North Kalimantan

Common assumptions underlying the economic analysis are as follows: (i) capital investments take place in 2018–2019 and operating expenses are spread evenly across the project evaluation period; (ii) the proportion of tradable inputs in capital and operating expenditures is one-third of the total, and a standard conversion factor of 1.08 is applied to tradables; (iii) project benefits accrue through 2047; and (iv) a discount rate of 9% is used to calculate the economic net present value (ENPV).

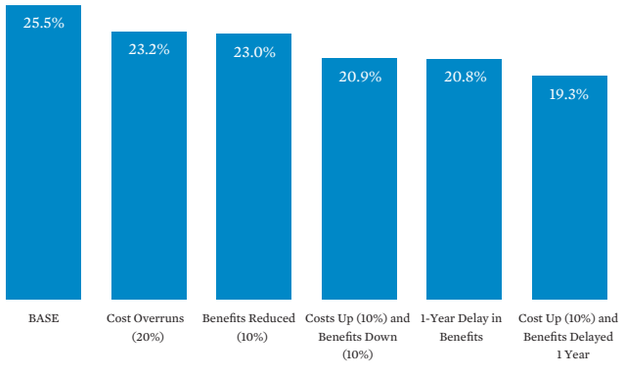
Table 20.1 Summary of Economic Internal Rate of Return and Sensitivity Analysis for North Kalimantan's Wood-Products Industry

	Economic Internal Rate of Return	Economic Net Present Value at 9% ($ million)	Economic Benefit–Cost Ratio
Base Estimate	25.5%	230.4	2.46
Cost Overrun of 20%	23.2%	214.6	2.24
Benefits Reduced by 10%	23.0%	191.5	2.21
Costs Increased by 20% and Benefits Reduced by 10%	20.9%	175.8	2.01
One-Year Delay in Program Start-up, with Benefits Delayed by 1 Year	20.8%	158.1	1.99
Cost Overrun by 20% and Benefits Delayed by 1 Year	19.3%	178.7	2.03

Source: Calculations by the authors.

The base-case economic internal rate of return (EIRR) calculation for North Kalimantan's wood and wood-products industry is presented in Table 20.1. The EIRR for the wood-products industry in Sabah is computed at 25.5%. These estimates are based on an assumed 22% shift of total illegal border trade to legal trade through the new road and CIQ facility, as well as associated changes in export demand discussed above. The benefits are large. The net present value, which is calculated as the difference between the present value of cash inflows and outflows, discounted at 9%, is equal to just over $230 million measured in 2016 prices over the 30-year period of analysis, while the economic benefit–cost ratio is nearly 2.5. Table 20.1 and Figure 20.4 also present the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows that Sabah's wood-products industry trade and investments following the road construction generally remain economically viable in the face of various project shortfalls during the period of analysis.

Figure 20.4. Economic Internal Rate of Return for North Kalimantan's Wood-Products Industry under Alternative Scenarios



Source: Calculations by the authors.

20.7 Internal Rate of Return of Sabah

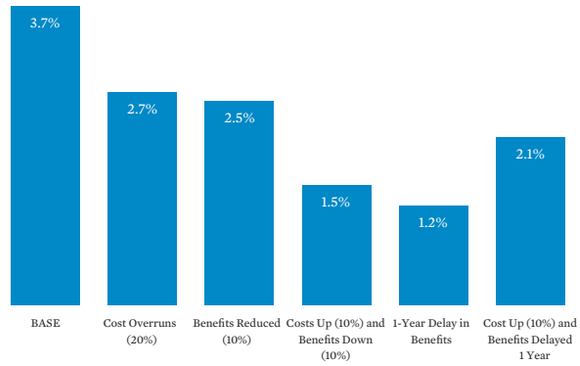
The base-case EIRR calculation for Sabah's wood-products industry is presented in Table 20.2. The EIRR for the wood-products industry in Sabah is computed at 18%. These estimated benefits are considered conservative because the additional share of total North Kalimantan production shifted from the East Kalimantan channel markets to Sabah is only 16.7%, and the actual share is likely to be significantly higher.

Table 20.2 Summary of Economic Internal Rate of Return and Sensitivity Analysis for Sabah's Wood-Products Industry

	Economic Internal Rate of Return	Economic Net Present Value at 9% ($ million)	Economic Benefit–Cost Ratio
Base Estimate	3.7%	(54.6)	0.65
Cost Overrun of 20%	2.7%	(70.4)	0.59
Benefits Reduced by 10%	2.5%	(64.9)	0.59
Costs Increased by 20% and Benefits Reduced by 10%	1.5%	(80.7)	0.54
One-Year Delay in Program Start-up, with Benefits Delayed by 1 Year	1.2%	(74.7)	0.53
Cost Overrun by 20% and Benefits Delayed by 1 Year	2.1%	(80.0)	0.54

( ) = negative.
Source: Calculations by the authors.

Figure 20.5. Economic Internal Rate of Return for Sabah's Wood Products Industry under Alternative Scenarios



Source: Calculations by the authors.

The net present value, which is calculated as the difference between the present value of cash inflows and outflows, discounted at 9%, is equal to –$55 million measured in 2016 prices over the 30-year period of analysis.

Table 20.2 and Figure 20.5 also present the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows that North Kalimantan's wood-products industry trade and investments following the road construction generally remain economically viable in the face of various project shortfalls during the period of analysis.

20.8 Capacity Building

Technical assistance needs are estimated at $2.5 million–$3.5 million. Capacity development will focus on the following components:

(a) Support the operations of champion individuals or institutions to enable clustering of companies on both sides of the border to promote development of supply chains;
(b) Possibly integrate company activities across borders in more formal value-chain production and distribution activities; and
(c) Examine the regulatory environment relative to Sabah and Peninsular Malaysia, promote best practices of successful wood manufacturers in Canada, the United States, Sweden, and Finland.

21

Fisheries

21.1 Rationale

The fisheries industry, also referred to as the seafood industry, includes all activities concerned with capturing, culturing, processing, preserving, storing, transporting, and marketing or selling fish or fish products. Enterprises in the industry carry out activities associated with wild-catch or aquaculture resources and the various transformations of those resources into products for sale. In the *seaweed industry*, both Sabah and North Kalimantan are expanding their production rapidly as global demand for dietary protein has risen. However, their supplies are subject to large variations and buyers have been reluctant to commit to long-term arrangements with local producers.

Despite the inherent mistrust among operators in the industry, they are interested in higher-value processing activities. The challenge in developing supply or value chains between Sabah and North Kalimantan companies will be in organizing producers and linking them with both upstream and downstream activities. While such cooperation is viable, it will require investment in clustering activities and a "champion" team to promote cross-border collaboration. The four product areas of potential collaboration are (i) crabs, other than frozen (HS 030624); (ii) prawns and shrimp, other than frozen (HS 030623); (iii) fresh or chilled whole fish (HS 030269); and (iv) fresh or dried seaweed (HS 121220).

21.2 Motivation

(a) North Kalimantan

North Kalimantan's fisheries industry is fragmented and lacks cohesion. Businesses operate independently of one another, with prices and markets established through bilateral arrangements. As in other countries and provinces within Indonesia, there is an inherent mistrust among producers, which makes cross-border collaboration difficult. Nearly all official shipments are in the form of frozen fish and crustaceans. Companies tend to export to traditional markets through established business connections. While the system provides market stability for the local producers, prices tend to be low compared with other markets. There is extensive unofficial trade with Sabah by local fishermen.

Figure 21.1 shows the 2016 distribution of official North Kalimantan exports to Sabah and the rest-of-the-world. Sabah absorbs about 19% of North Kalimantan's total official exports of marine products.

The province also has a large and growing seaweed industry. In 2016, for example, it produced 6,000 tons of seaweed per month. However, the market lacks a central distribution

system and producers rely on local business intermediaries to buy their products. As in Sabah, prices are subject to large short-term fluctuations. The provincial government has been seeking to find a mechanism to better the distribution system and provide a more stable market. In 2016, it offered to sell seaweed to Sabah where shortages had begun to emerge from local producers.

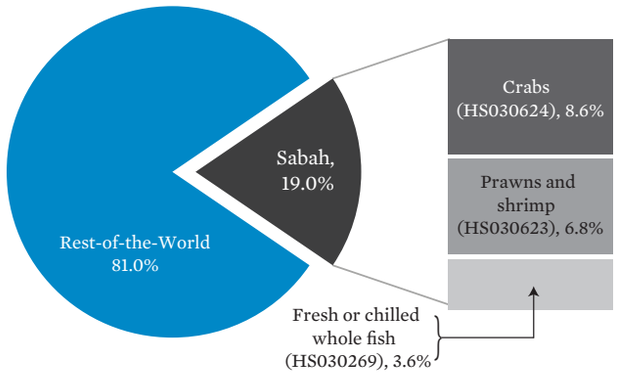
At present, North Kalimantan lacks production facilities for processing at the secondary stage of fish and prawn production. The Government of Indonesia is planning to build an integrated maritime affairs and fisheries center in Nunukan Regency in North Kalimantan during 2017, with the objective of making Indonesia a regional maritime axis. The center is to support the financing of fishing boats and gear, integrated cold storage facilities, storage rooms for seaweed, floating docks, and other types of infrastructure.[114]

(b) Sabah

In the primary stages of the fisheries value chain, the following are the main activities currently taking place in Sabah for the major types of products that are being exported (Table 21.1):[115]

- *Marine capture fisheries* are the most important activity, accounting for about 80% of total fish supplies. While the main commercial fishing methods consist of trawls, purse seines, and lift nets, in Sabah the main commercial fishing activity takes place through trawling. Trawling activities account for more than half of total fish landings, while prawn trawling is the most lucrative activity. Purse seiners of up to 100 gross ton capacity fish for small pelagic fish such as scads, sardines, and mackerels as well as small tuna.

Figure 21.1. Distribution of North Kalimantan's Official Marine Product Exports, 2016



Source: North Kalimantan customs authority.

Table 21.1. Sabah's Top Exports of Fresh or Frozen Fish, 2015 ($)

Shrimps and prawns, frozen, (030617)	243,817,046
Fish fillets and other fish meat, (030499)	46,050,283
Live fish, (030199)	28,452,855
Cuttle fish, dried, salted or in brine, (030749)	22,606,952
Other fish and crustaceans, or mollusks, (030389)	10,720,265
Salmonidae, nes, frozen, whole, (030329)	10,609,404
Turbots, fresh or chilled, (030224)	8,379,173
Octopus, frozen, dried, salted or in brine, (030759)	6,824,634
Oysters, live, fresh or chilled, (030711)	2,648,527
Crabs, not frozen, (030624)	2,522,464
Tuna, frozen, whole, (030349)	2,233,493
Lobsters, frozen, (030612)	1,865,936
Dried fish, not smoked, (030559)	1,409,433
Oysters, fresh, chilled, frozen or dried, (030719)	1,159,017
Cuttle fish, squid, live, fresh or chilled, (030741)	1,087,250
Trout, live, (030191)	1,075,698
Flatfish except halibut or sole, frozen, (030339)	1,071,924
Other fresh or chilled fish fillet (030449)	1,066,195
Crustaceans nes, frozen, (030619)	1,054,214
Aquatic invertebrates nes, fresh or chilled, live, (030791)	1,014,611

Note: numbers in parentheses refer to HS code.
Source: Derived from information provided by the Royal Malaysian Customs Department, Sabah.

[114] *Jakarta Post*. 2017. Indonesia to Build Maritime, Fisheries Center in Nunukan: Minister. 24 March.
[115] The following information draws on the industry profile provided by the Department of Fisheries, Sabah. http://www.fishdept.sabah.gov.my/?q=en/content/fisheries-profile.

- *Aquaculture* is becoming an important commercial activity, with total production of brackish water and freshwater aquaculture currently estimated at 35,000 metric tons per year, of which tiger prawn production in brackish water ponds are the most important activity. Major aquaculture producers are in the districts of Tawau as well as Semporna, Lahad Datu, and Sandakan.
- *Marine fish cage culture* is an increasingly important commercial venture targeting high-value marine species such as groupers, wrasses, snappers, and lobsters.

Table 21.2. Sabah's Top Exports of Processed Fish, 2015 ($)

Preparations of abalone (160557)	246,836
Sardines, prepared or preserved (160413)	202,080
Preparations of cuttle fish and squid (160554)	155,776
Fish prepared or preserved (160420)	49,846
Crab, prepared or preserved (160510)	44,814

Note: numbers in parentheses refer to HS code.
Source: Derived from information provided by the Royal Malaysian Customs Department, Sabah.

- Sabah is well-known as the sole state in Malaysia to grow *seaweeds*. Most seaweed farms are located in the sea areas around Semporna in the east coast off Sabah. There are two seaweed processing factories, which use sun-dried euchema seaweed to produce semi-refined carrageenan powder, which is mainly exported to the People's Republic of China.[116] The seaweed grown is a variety called Euchema, which when processed, produce carrageenan. Euchema seaweed is grown by tying seedlings to longlines that are floated in the open sea. A growing cycle takes about 40 days after which these are manually harvested and sun-dried.
- *Sabah* has also been expanding its *fish and prawn processing facilities*. The main packaged products include frozen gutted fish, prawns, frozen squids, and octopuses. For processed products consumed locally, the traditional offerings are dried or salted fish and crustaceans. Other products include fish balls and crackers. For processed products that are exported, the major products are preparations of abalone, sardines, cuttlefish or squid, crab, and other fish (Table 21.2).

21.3 Cross-Border Value Chain

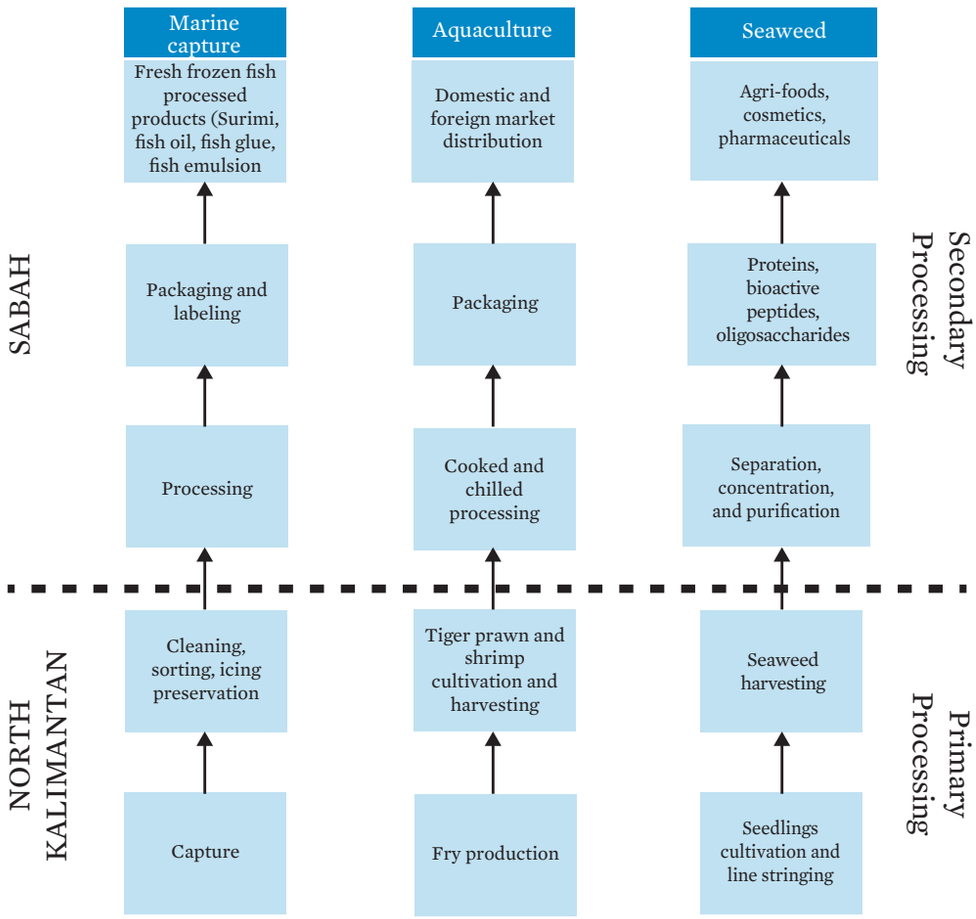
21.3.1 Project Coverage

The project aims to develop a cross-border value chain between Sabah and North Kalimantan in the fisheries industry. For Sabah, it is in line with the Eleventh Malaysia Plan and Sabah Structure Plan 2033. North Kalimantan's extensive activities in the primary stages of the fisheries industry offers an opportunity to offset Sabah's depleted local fish stocks. Figure 21.2 shows the basic production and processing stages along the value chain for three of North Kalimantan's and Sabah's major fisheries industry: marine capture, aquaculture, and seaweed production.

The project will promote cross-border clustering of activities in fisheries products that are more value-added downstream products, especially those products that are processed and packaged under internationally accepted standards. The targeted types of products include semi-refined carrageenan from locally-grown seaweeds, canned crab meat, surimi, and fish meal. Surimi or fish meat paste is a new local fisheries product and is used in the making of imitation crab and lobster meats, fish balls and cakes, and other convenient, ready-to-eat seafood products.

[116] Carrageenan is a marine bio-polymer used as a binder in food, cosmetic, and industrial products.

Figure 21.2. Cross-Border Value Chains in Fisheries Industry



Source: Representation by the authors.

The manufacture of surimi involves the processing of white fish meat such as from lizard fish, grunters, threadfins, and bigeye. These fishes are currently being landed in massive quantities by local trawlers. The project will also examine unofficial (informal or illegal) movements of fish and crustaceans from North Kalimantan to Sabah in an effort to regulate trade and support the formation of producer clusters. It will examine ways to motivate fishermen and wholesalers to formalize trading arrangements.

21.3.2 Indicative Implementation Arrangements

Development of the cross-border value chain for the fisheries industry will require that technical assistance be provided to producers on both sides of the border. Technical assistance will support the operations of champion individuals or institutions to promote the clustering of companies on both sides of the border to initially support development of supply chain arrangements, and later the possible integration of company activities across borders in more formal value-chain production and distribution activities.

21.3.3 Project Management

The project will be managed by a project steering committee (PSC) for the fisheries cross-border value chain, composed equally of public and private sector representatives. In Sabah, the Economic Planning Unit will be the focal agency; and, in North Kalimantan, the Office of the Governor will be the coordinating agency. In addition to guiding project implementation, the PSC will also be responsible for monitoring and evaluating the project.

21.4 Benefits Analysis

The impact of the project will be the improved cross-border collaboration between seafood companies in North Kalimantan and Sabah. The project champions will promote and implement concrete areas of cross-border collaboration, as well as develop export markets for the resulting cross-border value chains. The specific outcome of the project will be a minimum increase in cross-border trade by a factor of 2.5 within 5 years of project implementation. The resulting expansion in cross-border trade in marine products, from $17 million to $35 million, is modest compared with North Kalimantan's $81 million of total marine exports and Sabah's $147 million exports of marine products.

21.5 Cost Estimates

Anticipated investment costs are to be determined as part of the (technical assistance) capacity-building component of the project. Capital investments will be in the areas of plant processing facilities and expanding or upgrading the fishing fleet and infrastructure for aquaculture development. The potential amount of capital and operating expenses will be determined by a target economic internal rate of return (EIRR) of 20%.

21.6 Internal Rate of Return for North Kalimantan

The project start-up date is 2018, so the target outcome of the project is expected to be reached in 2022. The following underlying assumptions are made in order to derive the capital and operating costs needed to support the expanded marine products intra-industry trade: (i) capital investments take place once the project champions have identified and promoted the needed investments and operating expenses; (ii) the target EIRR is 20%; (iii) the proportion of tradable inputs in capital and operating expenditures is one-third of the total, and a standard conversion factor of 1.08 is applied to tradables; (iv) project benefits accrue through 2047; and (v) a discount rate of 9% is used to calculate the economic net present value (ENPV).

The base-case EIRR calculation for North Kalimantan's fisheries industry is presented in Tables 21.3. With a target EIRR of 20%, capital expenditures are estimated at $92 million and operating expenses are estimated at nearly $5 million a year during the life of the project. The estimates are considered conservative because there is considerable room for expansion of North Kalimantan–Sabah marine trade with high returns on the company investments. The net present value, which is calculated as the difference between the present value of cash inflows and outflows, discounted at 9%, is equal to just over $61 million measured in 2016 prices over the

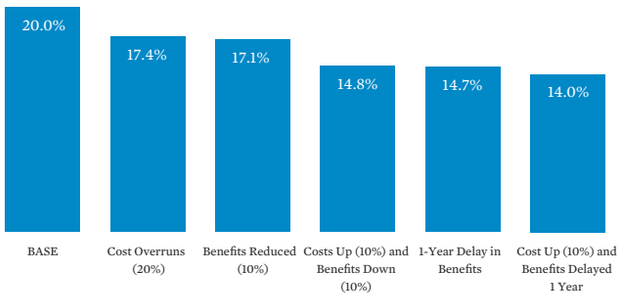
Table 21.3 Summary of Economic Internal Rate of Return and Sensitivity Analysis for North Kalimantan's Fisheries Industry

	Economic Internal Rate of Return	Economic Net Present Value at 9% ($ million)	Economic Benefit–Cost Ratio
Base Estimate	20.0%	61.0	1.60
Cost Overrun of 20%	17.4%	50.9	1.46
Benefits Reduced by 10%	17.1%	44.8	1.44
Costs Increased by 20% and Benefits Reduced by 10%	14.8%	34.7	1.31
One-Year Delay in Program Start-up, with Benefits Delayed by One Year	14.7%	30.8	1.30
Cost Overrun by 20% and Benefits Delayed by One Year	14.0%	35.9	1.32

Source: Calculations by the authors.

30-year period of analysis. Table 21.3 and Figure 21.3 also present the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows the project remains economically viable in the face of various project shortfalls.

Figure 21.3. Economic Internal Rate of Return for North Kalimantan's Fisheries Industry under Alternative Scenarios



Source: Calculations by the authors.

21.7 Derived Investment Potential for Sabah

The project start-up date for Sabah is 2018, so the target outcome of the project is expected to be reached in 2022. The following underlying assumptions are made in order to derive the capital and operating costs needed to support the expanded marine products intra-industry trade: (i) capital investments take place once the project champions have identified and promoted the needed investments and operating expenses; (ii) the target EIRR is 20%; (iii) the proportion of tradables inputs in capital and operating expenditures is one-third of the total, and a standard conversion factor of 1.08 is applied to tradables; (iv) project benefits accrue through 2047; and (v) a discount rate of 9% is used to calculate the ENPV.

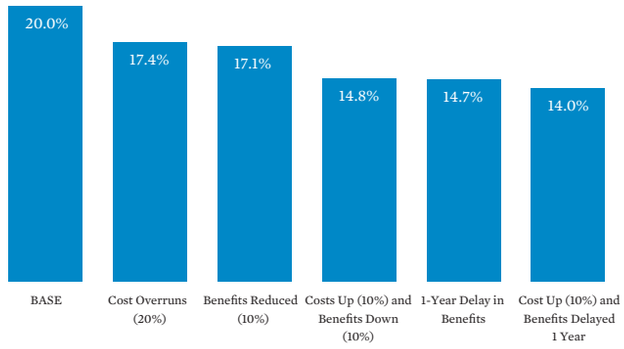
The base-case EIRR calculation for Sabah's fisheries industry is presented in Table 21.4. With a target EIRR of 20%, capital expenditures are estimated at $92 million and operating expenses are estimated at nearly $5 million a year during the life of the project. The estimates are considered conservative because there is considerable room for expansion of Sabah–North Kalimantan marine trade with high returns on the company investments. The net present value, discounted at 9%, is equal to just over $61 million measured in 2016 prices over the

Table 21.4. Summary of Economic Internal Rate of Return and Sensitivity Analysis for Sabah's Fisheries Industry

	Economic Internal Rate of Return	Economic Net Present Value at 9% ($ million)	Economic Benefit–Cost Ratio
Base Estimate	20.0%	61.0	1.60
Cost Overrun of 20%	17.4%	50.9	1.46
Benefits Reduced by 10%	17.1%	44.8	1.44
Costs Increased by 20% and Benefits Reduced by 10%	14.8%	34.7	1.31
One-Year Delay in Program Start-up, with Benefits Delayed by 1 Year	14.7%	30.8	1.30
Cost Overrun by 20% and Benefits Delayed by 1 Year	14.0%	35.9	1.32

Source: Calculations by the authors.

Figure 21.4. Economic Internal Rate of Return for Fisheries Industry under Alternative Scenarios



Source: Calculations by the authors.

30-year period of analysis. Table 21.4 and Figure 21.4 also present the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows the project remains economically viable in the face of various project shortfalls during the period of analysis.

21.8 Capacity Building

Technical assistance needs are estimated at $2.0 million–$3.0 million. Capacity development will focus on the following components:

(a) Support operations of champion individuals or institutions to promote the clustering of companies on both sides of the border to initially build supply chain arrangements.

(b) Possibly integrate company activities across borders in more formal value-chain production and distribution activities.

(c) Promote cross-border clustering of activities in fisheries products that are more value-added downstream products, especially these products that are processed and packaged under internationally accepted standards.

(d) Target products that include semi-refined carrageenan from locally grown seaweeds, canned crab meat, surimi, and fish meal.

(e) Where possible, support production of surimi or fish meat paste used in making of imitation crab and lobster meats, fish balls and cakes, and other convenient, ready-to-eat seafood products.

(f) Examine unofficial (informal or illegal) movements of fish and crustaceans from North Kalimantan to Sabah in an effort to regulate trade and support the formation of producer clusters.
(g) Explore ways to motivate fishermen and wholesalers to formalize trading arrangements.
(h) Examine unofficial (informal or illegal) movements of fish and crustaceans from North Kalimantan to Sabah in an effort to regulate trade and support the formation of producer clusters.
(i) Explore ways to motivate fishermen and wholesalers to formalize trading arrangements.

22

Organic Foods

22.1 Rationale

Organic agriculture in Southeast Asia is developing rapidly because of its premium regional and global markets. Organic prices in the large North American and European markets are more than 135% higher than conventional produce, and in some products organic varieties are 4 times higher than their equivalent conventional varieties. In both Indonesia's and Malaysia's large urban centers, prices of organic vegetables sold in supermarkets are much higher than non-organic produce.

Ecotourism is closely related to organic agriculture. The sector is growing rapidly throughout Southeast Asia and has enormous potential for a Sabah–North Kalimantan partnership. The Greater Mekong Subregion (GMS) has already implemented a cross-border ecotourism program supported by ADB and can serve as a model program for a similar Sabah–North Kalimantan project. ADB's GMS ecotourism offerings can be viewed on the following website: www.mekongecotourism.org.[117]

22.2 Motivation

22.2.1 Sabah

Sabah's organic foods are well organized. Malaysia offers the Malaysian Organic Scheme certification, which is issued by the Department of Agriculture and is a mandatory certification for farms practicing organic methods and selling the products as organic. MyGAP and myOrganic certificates are recognized and issued to farmers that meet conditions related to land, water sources, and fertilizers used. Currently, nearly 260 farmers have obtained these certificates, most of which are in Penampang, a district within the West Coast Division of Sabah.

22.2.2 North Kalimantan

In North Kalimantan, organic agricultural production of rice and other vegetables is fairly widespread. In the fisheries industry, there is organic shellfish production. Organic agriculture is widespread in the province, but not organized. For example, Krayan village in Nunukan Regency produces organic rice and salt using organic methods of cultivation. They are both widely recognized as high-value products in Southeast Asia, but not in Indonesia itself.[118]

[117] The website was developed and is being maintained by Montague Lord, one of the authors of this report.
[118] *Jakarta Post*. 2016. Rice and Salt: Krayan's Signature Products. 15 June. http://www.pressreader.com/ indonesia/ the-jakarta-post/20160615/282196535234182.

Organic shrimp is produced in farming ponds. Most shrimp are premium quality Black Tiger packaged under a variety of brand names, which is cooked and peeled for export to major markets like the European Union, the United States, and the Middle East.

Organic food producers in Indonesia need to comply with the government's Indonesian National Standard requirements in order to receive a certificate. The Ministry of Trade regulates the production, labeling, certification, and import of organic foods under regulation passed in 2010. At present, farmers in North Kalimantan are in the process of verification to receive the certification. International development partners are actively supporting local clusters of farmers for the production of organic vegetables. The German development agency, Deutsche Gesellschaft für Internationale Zusammenarbeit, has helped villagers in Setulang, Malinau Regency, to cultivate organic products and develop their ecotourism facilities. Similarly, World Wide Fund for Nature has established a project in Malinau Regency for organic food production and ecological tourism as a major economic driver for local villages.

22.3 Cross-Border Supply Chain

22.3.1 Project Coverage

The project aims to develop a cross-border value chain between Sabah and North Kalimantan in the organic foods industry, along with the ecotourism sector. The proposed value chain for organic agriculture and crustaceans is shown in Figure 22.1. The project will (i) survey existing local, domestic, and international markets for key organic products; (ii) explore opportunities for clustering of organic producers; (iii) organize training workshops for producers on requirements for national and international organic certifications; (iv) identify distribution systems for domestic supermarkets and international wholesalers; (v) help to link clusters with packaging companies; (vi) identify champions who can advance the organic foods movements across Sabah and North Kalimantan borders; and (vii) develop ecotourism linkages and cooperative arrangements across borders.

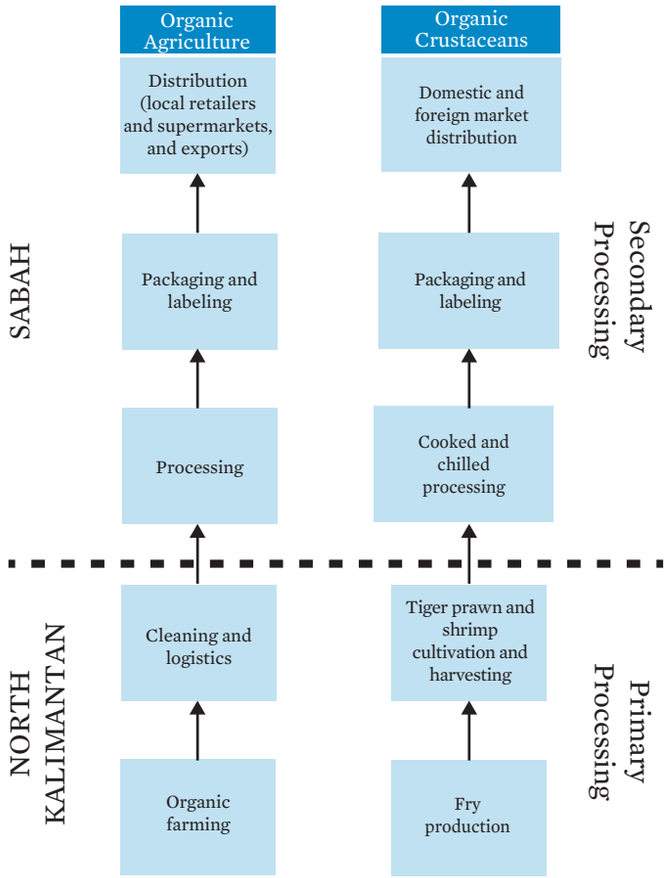
22.3.2 Indicative Implementation Arrangements

Development of the cross-border value chain for the organic foods industry, as well as ecotourism, will require that technical assistance be provided to producers on both sides of the border. Technical assistance will support the operation of champion individuals or institutions to promote the clustering of companies and service providers on both sides of the border to initially support development of supply-chain arrangements, and later the possible integration of company activities across borders in more formal value-chain production and distribution activities.

22.3.3 Indicative Implementation Arrangements

The project will be managed by a project steering committee (PSC) for the organic foods cross-border value chain, composed equally of public and private sector representatives. In North Kalimantan, the Office of the Governor will be the coordinating agency. In addition to guiding project implementation, the PSC will be responsible for monitoring and evaluating the project. In Sabah, the Economic Planning Unit will be the focal agency.

Figure 22.1. Cross-Border Value Chain in Organic Vegetables and Crustaceans



Source: Based on M. Lord and P. Tangtrongjita. 2010. Mapping the Organic Vegetable Value Chain along the EWEC. https://mpra.ub.uni-muenchen.de/42591/1/MPRA_paper_42591.pdf.

22.4 Capacity Building

Technical assistance needs are estimated at $2.5 million–$3.5 million. Capacity development will focus on the following components:

(a) Survey existing local, domestic, and international markets for key organic products;
(b) Explore opportunities for clustering of organic producers;
(c) Organize training workshops for producers on requirements for national and international organic certifications;
(d) Identify distribution systems for domestic supermarkets and international wholesalers;
(e) Help to link clusters with packaging companies;
(f) Identify champions who can advance the organic foods movement across Sabah and North Kalimantan borders; and
(g) Develop ecotourism linkages and cooperative arrangements across borders.

23

Medical Tourism

23.1 Rationale

Top procedures for medical tourism are (a) cosmetic surgery; (b) dentistry (general, restorative, cosmetic); (c) cardiovascular (angioplasty, coronary artery bypass graft, transplants); (d) orthopedics (joint and spine, and sports medicine); (e) cancer (often high-acuity or last resort); (f) reproductive (fertility, in vitro fertilization); (g) weight loss (Lap Band surgery, gastric bypass); and (h) scans, tests, and health screenings.[119] These and other procedures form part of the so-called *medical tourism value chain*. It extends services from the foreign patients' first contact with hospital agents in their country or in the hospital itself through all types of benefits received while in the country where the hospital is located. Nonetheless, medical procedures remain the focal stage of the value chain.

(a) Sabah

In Sabah, foreign patients are sourced through three methods: (i) medical tourism promotion programs by the Malaysia Health Tourism Council or the Sabah Tourism Board; (ii), hospital agents operating in countries like Indonesia where patients are located; and (iii) internet-based information about the services provided by the hospitals. Medical travel agents operating abroad often target self-insured or partially-insured patients seeking medical treatment at a considerable discount over that offered in their home country, as well as high-end technical procedures and facilities often not available in the home country.

(b) North Kalimantan

The Provincial Government of North Kalimantan is focusing on efforts to expand and improve basic medical services. While there are possible technological transfers from cooperative arrangements between North Kalimantan and Sabah, it is recognized that the main interest of the North Kalimantan population is the ability to access Sabah's high-quality facilities for specialized medical facilities at reasonable and competitive costs.

23.2 Motivation

(a) Sabah

Under the Eleventh Malaysia Plan, income from medical tourism is projected to grow 15% annually and generate RM2.0 billion (over $450 million) by 2020. Sabah is seeking to greatly expand its share of the medical tourism market. As such, the Sabah Structure Plan 2033 seeks

[119] Patients Beyond Borders. Medical Tourism Statistics and Fact. http://www.patientsbeyondborders. com/medical-tourism-statistics-facts (accessed 14 December 2016).

to promote the expansion of wellness centers and health tourism in the state. In support of this strategy, the government will support well-designed health centers that incorporate all aspects of health care, including connectivity, quality excellence of medical specialists, high-tech health equipment, nurse and medical technician training, and tourism links to Sabah's outstanding natural environment in the post-procedural medical services package.[120]

(b) North Kalimantan

North Kalimantan's market is potentially large. Tourism facilities in North Kalimantan are limited due to lack of both infrastructure and medical personnel. The public insurance system provides for nearly universal coverage of citizens, and North Kalimantan has one of the largest public hospitals in Indonesia. However, its facilities are rudimentary and only basic medical procedures are available. Specialized medical care must be sought outside the province and, to that end, Sabah offers excellent facilities for North Kalimantan people needing advanced medical attention. Preliminary estimates suggest that about a quarter of the population has the financial capacity to access private medical treatment abroad.

23.3 Cross-Border Value Chain

23.3.1 Project Coverage

The project aims to (a) support development of Sabah's full range of activities in the medical tourism value chain, and (b) address and help to remedy the major external and internal weaknesses and threats to the industry identified in the SWOT analysis described above. The regulatory issues to be addressed are those identified by the Malaysia Productivity Corporation (MPC) and discussed above.[121]

In developing Sabah's medical tourism value chain, the project will focus on the expansion of services by private hospitals in all stages of the pre- and post-medical intervention stage of the value chain (Figure 23.1). That includes expanding hospital agents abroad, offering services from patient's place of origin through all steps involved in their medical care, and returning them to their place of origin, with follow-up care. The project will also support capacity building for development of medical facilitator units, who coordinate medical tourism programs. The services provided include a single-window facility for the medical tourism, especially in the pre- and post-medical procedure stages, as well as the medical procedures themselves, along with logistics, travel, and tourism arrangements.

The project will also support development of all aspects of services related to immediate post-operative care, which includes follow-up, recovery, consultations, and medical and physical therapy. The major concern of the medical tourist is follow-up care after the patient has left the country of treatment and, to address this concern, a tie-up with medical service providers in the patients' home country is often provided. Finally, the project will help to develop service linkages to activities once post-operative care is completed, namely, those related to leisure activities in Sabah as a part of the package of medical tourism services.

[120] Sections HE1-3 and HE1-4 (pages 13-4 and 13-5) in Town and Regional Planning Department Sabah. 2016. *Sabah Structure Plan 2033*. Kota Kinabalu, Sabah.

[121] Malaysia Productivity Corporation. 2016. Reducing Unnecessary Regulatory Burden on Business: Medical Professional. 31 August. Kuala Lumpur.

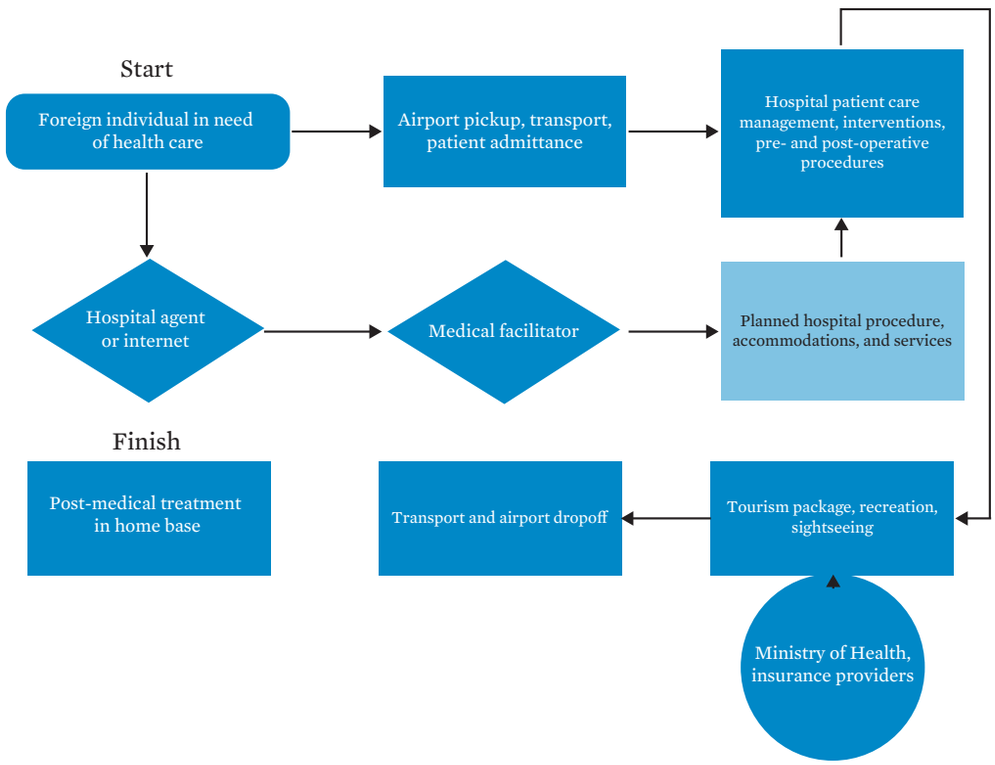
23.3.2 Implementation Arrangements

Technical assistance will support the operations of champion individuals or an institution that will help private hospitals in Sabah to cluster the common pre- and post-medical intervention areas. Examples include use of common overseas agents and advertising, transport services, and leisure activity programs following medical interventions. The technical assistance will also address the regulatory environment and explore ways to overcome the major constraints and threats to the medical tourism industry in Sabah.

23.3.3 Project Management

The project will be managed by a project steering committee (PSC) for medical tourism. Technical assistance for the development of the value chain and improvements in the regulatory environment will take place in Sabah, since North Kalimantan is simply a market for medical services. The Economic Planning Unit will be the focal agency. In addition to guiding project implementation, the PSC will also be responsible for monitoring and evaluating the project.

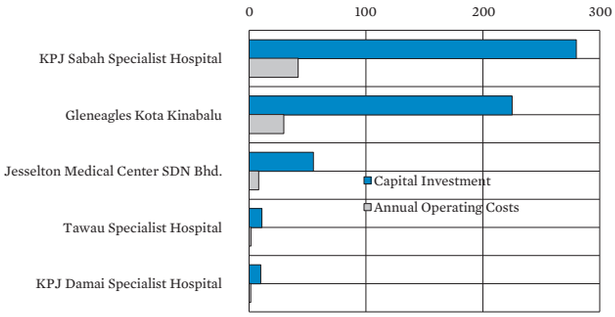
Figure 23.1. Medical Tourism Value Chain



Source: Adapted from Indian Institute of Tourism and Travel Management. 2011. A study of problems and challenges faced by medical tourists visiting India. Delhi: Indian Institute of Tourism and Travel Management; originally conceptualized by G. R. Acharyulu and B. K. Reddy. 2004. Hospital logistics strategy for medical tourism. Supply Chain Seminar: An International Conference on Logistics. Brisbane: Queensland University of Technology.

23.4 Cost Estimates

Figure 23.2. Operating and Capital Costs of Sabah's Hospitals (RM million)



Source: Interviews conducted by authors with each hospital.

Data limitations in Malaysia's medical tourism are well documented.[122] The paucity of available medical tourism statistics severely limits the extent to which medical tourism's impacts can be reliably assessed, making it difficult to evaluate the real and potential impacts of medical tourism calculations and distribution. Medical tourism is strictly defined to be activities related to travel and hosting tourists who stay at least one night at the destination region to maintain, improve, or restore health through medical intervention.[123] Yet available data for Malaysia indiscriminately encompass all registered patients with foreign passports, which by default also encompass expatriates, migrants, business travelers, and holiday-makers for whom health care may not be the main motive for their stay.[124] For Sabah, data for the major international private hospitals have been made available for the present study by the administrative authorities of those hospitals as part of the survey conducted by the authors. Figure 23.2 reports the operating and capital costs of Sabah's hospitals.

23.5 Benefits Analysis

For demand, the information provided by Sabah's hospitals to the authors covers services to all patients with foreign passports, regardless of the original purpose of their visit. There are two forecasting methods that can be used to generate market demand projections. The first is based on pure time series analysis in which future values are derived from previous observations of the same variable.[125] The second is based on structural econometric analysis where estimation is based on theory-based economic relationships. In the present case, we adopt time series analysis for long-term forecasting of Sabah's market for medical tourism.[126]

Figure 23.3 shows the actual and fitted exponential trend line for the combined demand for medical tourism in Malaysia, Thailand, and Singapore between 2003 and 2013. The trend line shows an annual growth rate of 11.3% during the period, which reflects the rapid worldwide expansion of the market for overseas medical treatment. While past performance does not guarantee future results, there is no indication of a reversal in this trend.

[122] See M. Ormond, W. Mun, and C. Khoon. 2014. Medical tourism in Malaysia: how can we better identify and manage its advantages and disadvantages?. *Global Health Action*. https://doi.org/10.3402/gha. v7.25201.

[123] G. Musa et al. 2012. How satisfied are inbound medical tourists in Malaysia? A study of private hospitals in Kuala Lumpur. *J Trav Tour Mark*. 29. pp. 629–46.

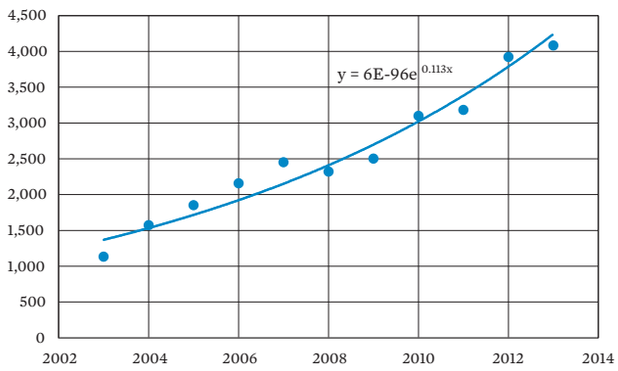
[124] M. Ormond. 2013. *Neoliberal Governance and International Medical Travel in Malaysia*. Abingdon: Routledge.

[125] Formally, time series analysis uses auto-correlation and cross-correlation techniques in which the parameters are assumed to follow an underlying stationary stochastic process that has a certain structure which can be described using a small number of parameters (for example, using an autoregressive or moving average model).

[126] The methodology follows that of H.-S. Dang et al. 2016. An Application of the Short-Term Forecasting with Limited Data in the Healthcare Traveling Industry. *Sustainability*. 8 (10). p. 1037. https:// mediathek.hgk.fhnw.ch/detail.php?id=doajarticle179ce6e4ad3a4228a868425f81518b8d.

North Kalimantan has a sufficient proportion of its population in the high-income brackets. Recall from earlier chapters that North Kalimantan's per capita income is 2.5 times higher than that of Sabah. Its income distribution is also more evenly divided among its population than that of Sabah, since the Gini coefficient for North Kalimantan averages 0.29, whereas that of Sabah is 0.39 (See Figure 23.4 for details).[127] That fairly wide distribution of income means that there is a sufficiently large number of persons in the province who have above-average incomes and who have the potential to access medical services in Sabah.

Figure 23.3 Medical Tourism in Malaysia, Thailand, and Singapore, 2003–2013
(thousands of international patients)

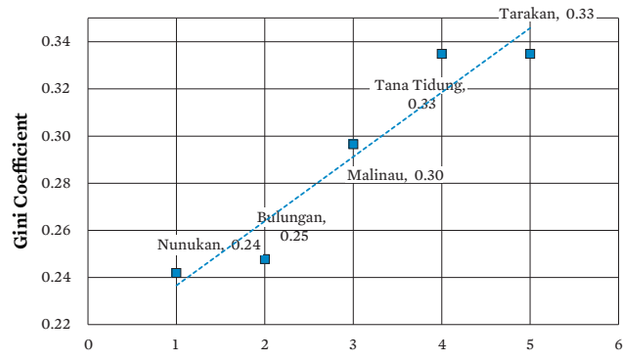


Source: Calculations by the authors.

23.6 Gap Analysis

Gap analysis involves the comparison of actual capacity with potential capacity utilization rates based on market performance. In the case of Sabah, the existing number of patients in the five major international private hospitals is 183,436, while the current capacity of those five hospitals is estimated at 550,000 and additional planned investment is likely to bring that capacity up to 600,000 patients by 2020.

Figure 23.4 Gini Coefficient of Selected Locations in North Kalimantan, 2013

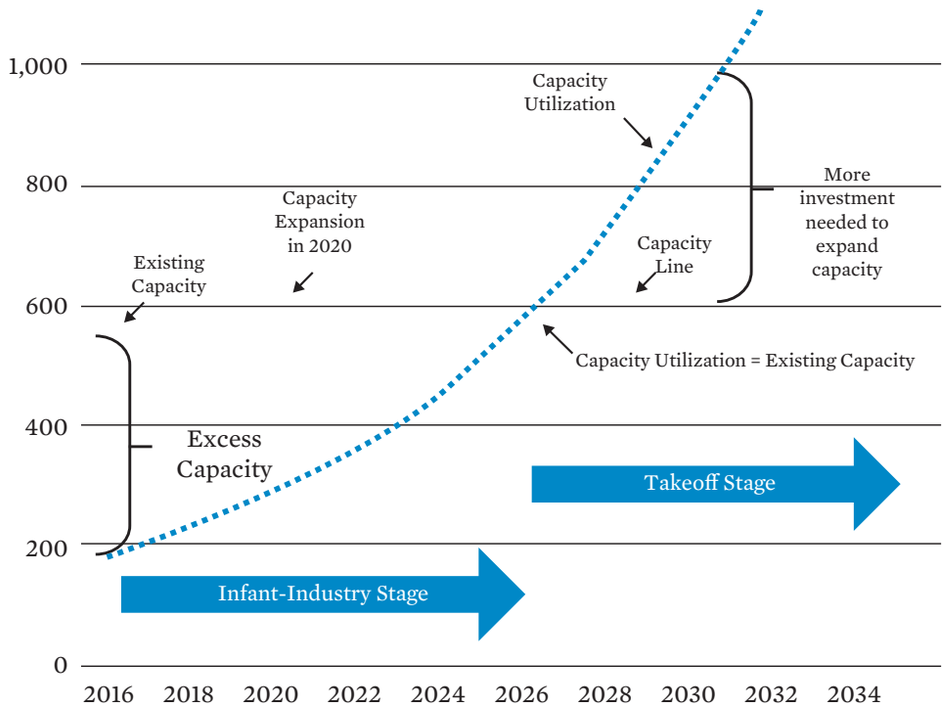


Source: Calculations by the authors.

Figure 23.5 shows the difference between actual and projected patients (capacity utilization) and the ability of the hospitals to handle international patients over the coming years. The analysis shows that in the next 10 years (2016 to 2026) there is likely to be excess capacity since the larger hospitals are relatively new and the Sabah medical tourism industry is still at its infant stage of development. With additional planned investment for 2020, some additional capacity will come online, and in 2027 it is expected that capacity utilization will reach the existing capacity of the five hospitals. After 2027, however, the Sabah medical tourism industry is likely to enter its takeoff stage of development and there will likely arise capacity shortages. The implication of these findings is that new investment will need to occur in the early 2020s to ensure that sufficient capacity exists to handle the demand for medical services from the global market.

[127] A Gini coefficient of 1 expresses maximal inequality among values, whereas a coefficient near 0 means that only one person has all the income and all others have none.

Figure 23.5. Gap Analysis of Sabah's Five Leading Private International Hospitals (thousands of patients)



Source: Calculations by the authors.

23.7 Benefits

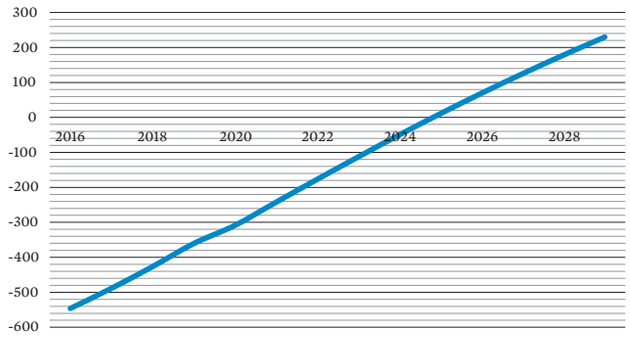
Sabah's medical tourism benefits can be measured using three alternative methods, which reflects the commonly used approaches to building regional and national income and production accounts. At the outset of the analysis, it is important to establish the method to be used and apply it uniformly across the cost–benefit analysis for medical tourism to avoid what is often double or triple counting of potential project benefits and thereby overestimating those benefits. The first method is the income approach to measuring incremental flow of factor incomes. The second method is the product approach, which calculates the incremental real value of production, or productivity, from medical tourism. The third method is the expenditure approach used to measure the incremental demand for goods and services generated by medical tourism. In the present case, the benefits from medical tourism follows the expenditure approach. When benefits involve tradables, export demand is assumed to be perfectly elastic and world prices are therefore appropriate measures of traded outputs. As with cost estimates, the shadow exchange rate factor (SERF) used to derive economic values for benefits produced by medical tourism from their financial values is 1.09 and this ratio is assumed constant over the period of analysis.[128]

[128] The same SERF was applied as in ADB. 2013. Guangxi Nanning Vocational Education Development Project. Manila. The SERF is derived by calculating the reciprocal value of the standard conversion factor estimated for the PRC of 0.93, that is, 1/0.93 = 1.08).

23.8 Internal Rate of Return

Common assumptions underlying the economic analysis are as follows: (i) operating and maintenance costs are spread evenly across the duration of project implementation; (ii) the proportion of tradable inputs in capital and operating expenditures is one-third of the total; a standard conversion factor of 1.08 is applied to tradables; (iii) project benefits accrue through 2045; and (iv) a discount rate of 9% is used to calculate the economic internal rate of return (EIRR). The base-case EIRR calculation for medical tourism is presented in Tables 23.1. The EIRR for the medical tourism industry in Sabah is computed at 22%. These estimated benefits are considered conservative because qualitative benefits are excluded from the analysis. The net present value, which is calculated as the difference between the present value of cash inflows and outflows, discounted at 9%, is equal to just over RM1,049 million measured in 2016 prices over the 30-year period of analysis. The economic benefit–cost ratio is the ratio of the industry's medical tourism benefits relative to its monetary costs.

Figure 23.6. Overall Payback Schedule of Sabah's Investment in Medical Tourism Industry



Source: Calculations by the authors.

Since the general rule-of-thumb is that benefits that exceed costs indicate a worthwhile investment, the 1.7 ratio suggests a robust investment for the industry in general. Finally, Figure 23.6 shows the payback schedule of the overall investment in the industry. Payback occurs in 2024, 8 years after the initial investment, which suggests a moderate breakeven point.

Table 23.1 also presents the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows that medical tourism generally remains economically viable in the face of various shortfalls in the growth of medical tourism during the period of analysis, as well as the lack of additional capacity expansion currently planned

Table 23.1 Summary of Economic Internal Rate of Return and Sensitivity Analysis for Sabah's Medical Tourism Industry

	Economic Internal Rate of Return	Economic Net Present Value at 9% (RM million)	Economic Benefit–Cost Ratio
Base Estimate	21.9%	1,048.9	1.72
Benefits Reduced by 10%	18.9%	797.9	1.55
Benefits Reduced by 20%	15.8%	547.0	1.37
Benefits Reduced by 25%	10.4%	129.4	1.07
No Capacity Expansion in 2020	14.4%	589.3	1.32
Benefits Down 10% and No Capacity Expansion in 2020	13.2%	389.3	1.22

Source: Calculations by the authors.

for 2020. Given the robust growth of the medical tourism market, short-term variability in the market is common and there can, of course, occur temporary losses in the industry.

23.9 Capacity Building

In addition to capital and operational expenses for the project, technical assistance needs are estimated at $1.5 million–$2.5 million. Capacity development will focus on the following components:

(a) Support development of Sabah's full range of activities in the medical tourism value chain;
(b) Implement remedial solutions to major external and internal weaknesses and threats to the industry identified in the SWOT analysis (Section 14.5);
(c) Address regulatory constraints to the industry, as identified by the MPC Section (14.1).

24 Private Technical and Vocational Education and Training

24.1 Rationale

(a) Sabah

Higher education and technical and vocational education and training (TVET) are one of the six strategic drivers in Malaysia's Eleventh Plan to enhance human capital development. This focus is to help move Malaysia's economy from labor-intensive production to knowledge- and innovation-based economic activities. That shift will, in turn, require a much larger skilled labor force than the one that currently exists in Malaysia. Moreover, the Eleventh Plan underscores the need to better align knowledge, skills, and attitudes with industry requirements, and to develop TVET services with (a) quality standards for both public and private TVET services; (b) industry guidance with curriculum designs; (c) delivery and job placements; (d) attitude changes in how TVET is viewed by secondary school graduates deciding on career paths; (e) TVET's ability to attract students with high academic qualifications; and (f) increased access to innovative, industry-led training programs.

Several changes in the TVET system have already been put in place to achieve the above objectives: (i) a single qualification system; (ii) a single rating system for both public and private TVET institutions; (iii) industry-led designs and delivery of curricula for TVET institutions; (iv) Centers of Excellence in niche areas; (v) TVET promotion campaigns; and (vi) a productivity-linked wage system to ensure that wages are based on qualifications, skills, and productivity criteria.

In Sabah, international higher education and TVET are both at an infant stage of development, but the state has a large and well-established education base from which to reach a takeoff stage of development by 2020. What is lacking is the development of an integrated system to incorporate international students into higher-education institutions and especially TVET institutions. That process is represented in Figure 24.1. The higher-education value chain extends the traditional model of value chains that focus on internal production and support activities, which is mainly oriented toward manufacturing processes, to *value deliverable networks* that emphasizes linkages between suppliers, integrators, and core value-adding activities to enhance both the production output of the economy and its general welfare.[129]

In its application to Sabah's higher-education and TVET value-chain delivery network, the learning processes are themselves the activity that generate value additions to the economy. Higher-education activities are therefore the core element of the value delivery network. The deliverables in the network are in the form of intangibles that derive from knowledge, and they

[129] The concept of value networks has been proposed by M. Deise et al. 2000. *Executive's Guide to E-Business: From Tactics to Strategy*. New York: Wiley.

account for the overall worth, or value, to Sabah's economy. The strategic core value-chain integrators refer to the shared plan, implementation, and management of key stakeholders of the higher-education and TVET systems. They are made up of the federal and Sabah state governments' strategy and implementation activities for higher-education and TVET, the inputs and guidelines provided by Sabah's industries, and the educational community itself. The principal inputs are both the local and foreign students and the educators and administrators in the educational system.

(b) North Kalimantan

There are limited higher education and TVET facilities in North Kalimantan and much of the interest is in accessing nearby facilities in Sabah or East Kalimantan. The project therefore focuses on higher education and TVET development in Sabah that is specifically aimed at North Kalimantan and other foreign students.

24.2 Motivation

As one of the six strategic drivers in Malaysia's Eleventh Plan, the enhancement of human capital development is an integral part of the Sabah Structure Plan 2033.[130] While international higher education and TVET are both at an infant stage of development in Sabah, the state has a large and well-established education base from which to reach a takeoff stage of development by 2020. To reach that stage, Sabah will need to greatly expand its higher-education and TVET facilities to develop sufficient capacity for human capacity development. Indeed, all higher learning institutions will need to develop an integrated approach to value deliverable networks linking suppliers, integrators, and core value-adding activities that enhance both the production output of the state economy and its general welfare.

For Sabah, the focal sources for international students are North Kalimantan and the rest of the world. At present, international students in Sabah are mainly enrolled in private TVET and higher education institutions, since the government strictly limits enrollment of international students in public TVET institutions. Nevertheless, in higher education, Universiti Malaysia Sabah, though a public institution, has international students. But their proportion is small. In the 2014/2015 academic year, they represented only 3.4% of the total student body and the proportion declined in 2015/2016, despite efforts to treble international enrollment.

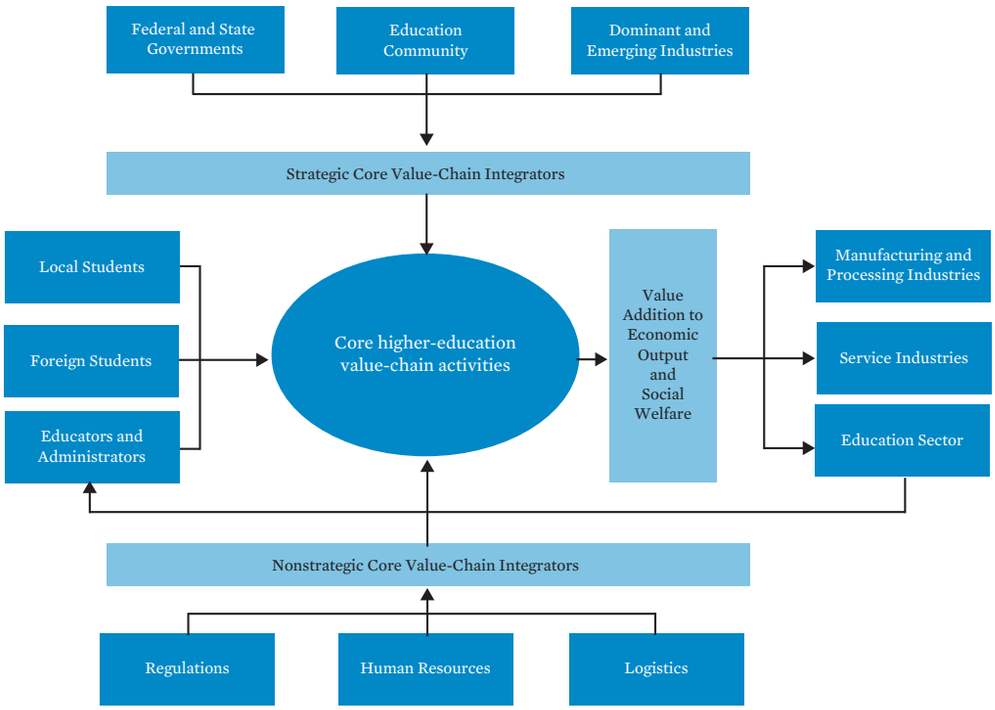
24.3 Cross-Border Value Chain

24.3.1 Project Coverage

The project aims to (a) support development of Sabah's full range of activities in international higher-education and TVET offerings; and (b) address and help to remedy the major external and internal weaknesses and threats to the industry identified in the SWOT analysis described above. The latter includes the regulatory issues identified by the Malaysia Productivity Corporation, which included the following reforms:[131] (i) reduce delays in issuing visas and

[130] Town and Regional Planning Department Sabah. 2016. *Sabah Structure Plan 2033.* Kota Kinabalu, Sabah.
[131] Malaysia Productivity Corporation. 2015. Reducing Unnecessary Regulatory Burden on Business: Private Higher Education. July. Kuala Lumpur.

Figure 24.1. Value Delivery Network of International Higher Education and TVET



TVET = technical and vocational education and training.
Source: Adopted from D. Chaffey, F. Ellis-Chadwick, R. Mayer, and K. Johnston. 2006. *Internet Marketing: Strategy, Implementation and Practice*. Third Edition. London: Prentice Hall for Financial Times.

passes for international students; (ii) minimize the requirements for international academic staff who have already been accredited in their home country; (iii) reduce delays for the approval of academic programs; (iv) consult with private higher education institutions before introducing new requirements; and (v) reduce the number of agencies involved in approving student visas, international staff working permit, and the introduction of programs by private higher education institutions (Figure 24.1).

24.3.2 Implementation Arrangements

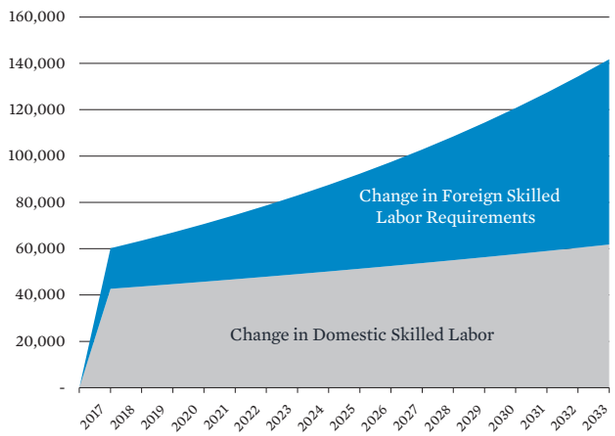
Development of the higher-education and TVET value chain will require that technical assistance be provided to producers on both sides of the border. Technical assistance will support the operations of champion individuals or an institution that will help higher-education and TVET institutions in Sabah to cluster shared areas of interest. Examples include use of common overseas agents and advertising, online courses, housing facilities, program designs in line with industry needs. The technical assistance will also address the regulatory environment and explore ways to overcome the major constraints to the development of higher education and TVET institutions in Sabah.

24.3.3 Project Management

The project will be managed by a project steering committee (PSC) for higher education and TVETs. Technical assistance for the development of the value chain and improvements in the regulatory environment will take place in Sabah, since North Kalimantan is simply a market for higher education and TVET services. The Economic Planning Unit will be the focal agency. In addition to guiding project implementation, the PSC will also be responsible for monitoring and evaluating the project.

24.4 Cost Estimate

Figure 24.2. Changes in Sabah's Skilled Labor Requirements, by Source (number of persons)



Source: Calculations by the authors.

Normally, project economic analysis involves the selection of alternative actions that represent the least-cost option, which itself produces an economic internal rate of return that is higher than the opportunity cost of capital. However, in the present case, we lack information about project costs needed to provide TVET facilities to develop the near-future skilled labor required in Sabah.

Instead, the project analysis will be approached by asking the following question: *What is the cost of TVET facilities associated with a minimum (non-negative) economic international rate of return (EIRR), given the anticipated demand for skilled labor?* When the full feasibility analysis is undertaken, that cost then represents the upper limit to alternative project investment options to develop the needed TVET skilled labor required in Sabah. In the full feasibility study, that upper limit represents the maximum cost of the combined investment in TVET facilities and related activities.

24.5 Gap Analysis

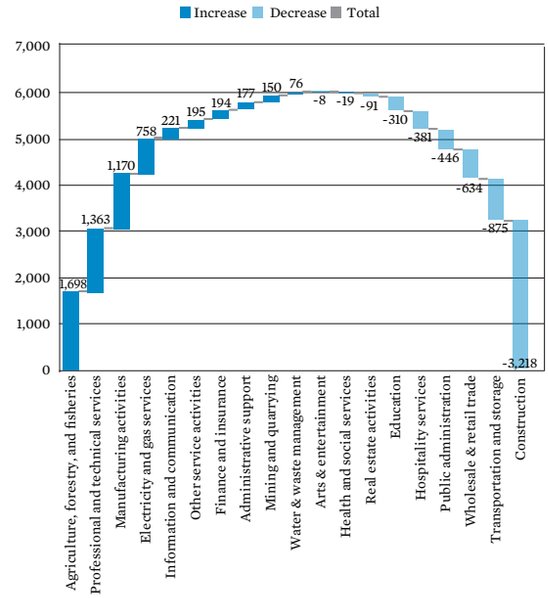
Under the Sabah Structure Plan 2033 (SSP2033), the projected higher-learning requirements reflect the goals set out in the Malaysian Education Program through 2025. Those requirements match those of the Eleventh Plan, which anticipates that 60% of new jobs will require TVET-related skills, and sets as one of its principal goals that supply matches demand for industry-led TVET. For that goal to be met, new TVET centers will need to be created throughout Sabah. In particular, private institutions in the state are expected to double their classroom capacity by 2020 to support local needs as well as to attract international students. Under the 20-year planning framework in SSP2033, population growth is projected at 2.34% a year through 2033.

That growth rate is substantially higher than the Sabah Development Corridor Blueprint 2008–2025 because of higher anticipated cohort survival rate and noncitizen settlers.[132] It will result in Sabah becoming the second most populated state after Johor, and moving ahead of the current second most populated state of Selangor. It will also mean that an increasing number of skilled labor will need to be sourced from foreign countries, including the neighboring province of North Kalimantan.

In terms of specific occupation requirements, a recent study on the demand and supply of TVET in Malaysia points to the following findings for Sabah's TVET public institutions:[133]

- Top *undersupply* TVET occupational areas by 2020: (a) wholesale and retail trade, (b) construction, and (c) transportation and storage.
- Top three *oversupply* TVET occupational areas by 2020: (a) professional, scientific, and technical activities; (b) manufacturing; and (c) agriculture, forestry, and fishing.

Figure 24.3. TVET Gap Analysis: Oversupply (+) versus Undersupply (–)



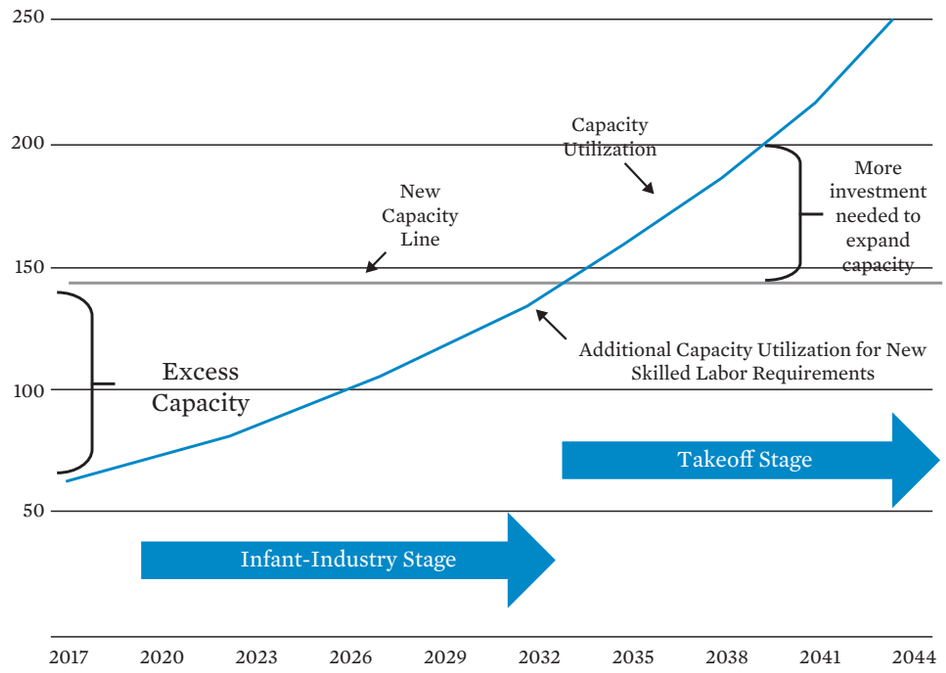
TVET = technical and vocational education and training.
Source: PricewaterhouseCoopers. Forthcoming. Study on the Demand and Supply of Human Capital Requirements on Technical Vocational Education and Training (TVET).

Figures 24.2 and 24.4 show the gap between Sabah's supply and demand for TVET graduates between 2016 and 2020, based on the aforementioned study. Supply is measured by the number of TVET graduates, while demand is measured by the number of TVET jobs created in each activity or industry. A positive number therefore represents a supply deficit, or undersupply, while a negative number represents a supply surplus, or oversupply. Nevertheless, occupation requirements are likely to be understated for professional and technical activities, manufacturing and agriculture, and forestry and fisheries if the other projects in this study are supported and economic and financial stimulus given to medical tourism, high-end palm oil manufacturing, fish processing, furniture making, and organic foods. Indeed, the supply–demand balance is likely to shift to an undersupply of skilled labor in these three occupation areas.

Finally, Figure 24.2 shows the projected additional TVET student requirements needed to meet the increased demand for skilled labor. Capital investment to expand capacity of TVET institutions is increased by the amount needed to meet skilled labor requirements in 2033.

[132] The cohort survival rate refers to the percentage of enrollees at the beginning grade or year in a given school year who reached the final grade or year of the elementary/secondary level.
[133] PricewaterhouseCoopers. Forthcoming. Study on the Demand and Supply of Human Capital Requirements on Technical Vocational Education and Training (TVET).

Figure 24.4. Gap Analysis of Sabah's TVET Institutions
(thousands of students)



TVET = technical and vocational education and training.
Source: Calculations by the authors.

With additional investment, additional capacity utilization will be met by the new facilities. But in 2033 additional capacity expansion of Sabah's TVET facilities will be needed.

24.6 Benefits Analysis

Incremental benefits to TVET graduates can be measured by their employment and the earnings potential, as compared with the employment and earnings of workers with a lower education or training level.[134] The anticipated demand for skilled labor is based on the government's Eleventh Plan expectation of 5% to 6% real GDP growth through 2025. If Sabah's economic growth matches the country's overall growth rate, then the demand for the state's skilled labor force will increase by 62% in 2025 and it will be 2.5 higher in 2033.[135] This expansion assumes labor productivity rates "labor coefficients" of Sabah similar to those of

[134] An alternative method is to measure the impact of additional years of education on earnings based on survey data and statistical models. However, the results are subject to an elevated level of uncertainty, and the former method is usually preferred. For details, see ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila. http://dx.doi.org/10.22617/TIM178607-2.

[135] Note that these estimates are about 6 times greater than the estimates for skilled labor jobs created during 2016–2020, according to the study by PricewaterhouseCoopers. Forthcoming. Study on the Demand and Supply of Human Capital Requirements on Technical Vocational Education and Training (TVET). In part, the difference reflects the current study's estimate for all skilled labor in Sabah, while the PricewaterhouseCoopers study is limited to public TVET institutions.

Malaysia as a whole, as well as the Eleventh Plan's expectations that 60% of increased labor demand will be for skilled workers.[136]

Salary benefits are calculated from the recently released Human Resources Ministry published a guidebook entitled "Salary Guide, Starting Salaries for 160 Selected Skill-Based Jobs."[137] From the guidebook, we use the average wage rate of a Malaysian Skills Diploma, which is RM1,830 a month, and Advanced Diploma, which is RM2,270 a month, compared with the minimum wage rate for Malaysia, which is RM920 a month for Sabah, effective 1 July 2016.

Finally, benefits are measured using the income approach, which measures incremental flow of factor incomes.[138] These estimates are the *direct benefits* and do not include the indirect benefits resulting from higher income levels and the multiplier effect on the Sabah economy from other income sources as a result of the larger pool of skilled labor. If we include the indirect effects, then the multiplier for the benefits from increased education would be 1.25.[139] Hence, total benefits are calculated in the next section based on the direct and indirect effects of TVET.

24.7 Internal Rate of Return

Given the importance and priority of TVET to the government's Eleventh Plan and the SSP2033, the focus of the present economic and financial analysis is on TVET expansion of facilities needed to meet Sabah's anticipated rapid expansion in real GDP. The analysis covers both private and public TVET, with private TVET absorbing foreign students since there are strict limits to their absorption in public TVET institutions.

In the case that the government wishes to treat the trade development program with North Kalimantan as a number of interlinked components that form part of a large project, the economic analysis needs to analyze all the components or projects as one single investment and evaluate its economic viability accordingly. Hence, the same time period and assumptions need to be applied uniformly.

[136] *Labor productivity* is represented by the ratio of GDP to the number of employees and converted into US dollars and into real terms using the GDP deflator. We use the average labor coefficient of Malaysia input–output tables of 2012, as reported in M. S. Sauian, N. Kamarudin, and R. M. Rani. 2013. Labor Productivity of Services Sector in Malaysia: Analysis Using Input-Output Approach. *Procedia Economics and Finance*. 7. The labor coefficient is defined as lj = Lj/Xj, where lj is the coefficient of labor requirement for the j-th sector output, *Lj* the labor force employed in sector j and *Xj* is the gross output of sector j.

[137] Human Resources Ministry. 2016. *Salary Guide, Starting Salaries for 160 Selected Skill-Based Jobs*. Kuala Lumpur. http://www.mohr.gov.my/pdf/MPGN%20Eng.pdf.

[138] As indicated earlier, it is important to avoid double or triple counting of potential project benefits and thereby overestimating those benefits by using only one of three commonly used methods for measuring benefits. The first method is the income approach to measuring incremental flow of factor incomes. The second is the product approach, which calculates the incremental real value of production, or productivity, from TVET. The third method is the expenditure approach used to measure the incremental demand for goods and services generated by higher earnings of skilled workers over those of unskilled workers. All three methods yield the same valuation of benefits, so the preferred choice should be based on data availability.

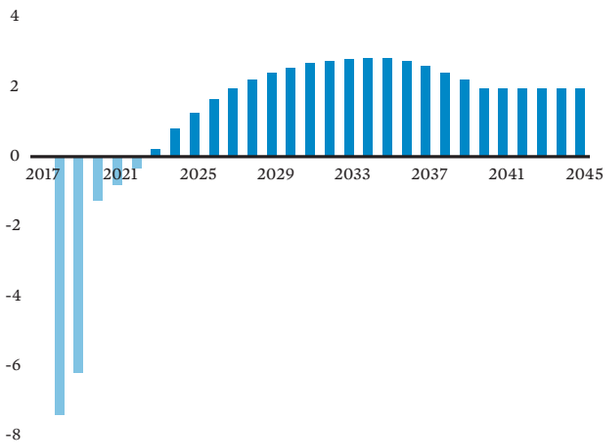
[139] The multiplier refers to Type II multiplier estimate for the education sector of Malaysia in 2000, as calculated by H. A. Bekhet. 2011. Output, Income and Employment Multipliers in Malaysian Economy: Input-Output Approach. *International Business Research*. 4 (1). January. http://citeseerx.ist.psu.edu/viewdoc/dow nload?doi=10.1.1.662.6188&rep=rep1&type=pdf.

Table 24.1 Summary of Economic Internal Rate of Return and Sensitivity Analysis for Sabah's TVET

	Economic Internal Rate of Return	Economic Net Present Value at 9% (RM million)	Economic Benefit–Cost Ratio
Base Estimate	20.5%	52.4	2.85
Costs Increased by 20%	18.3%	46.7	2.38
Benefits Reduced by 20%	17.9%	36.2	2.28
Costs Increased by 20% and Benefits Reduced by 20%	15.8%	30.6	1.90
One-Year Delay in Program Start-up, with Benefits Delayed by 1 Year	15.7%	26.5	1.86
Cost Overrun by 20% and Benefits Delayed by 1 Year.	16.5%	37.9	2.12

TVET = technical and vocational education and training.
Source: Calculations by the authors.

Figure 24.5. Sabah TVET Discounted Cash Flows (RM million)



TVET = technical and vocational education and training.
Source: Calculations by the authors.

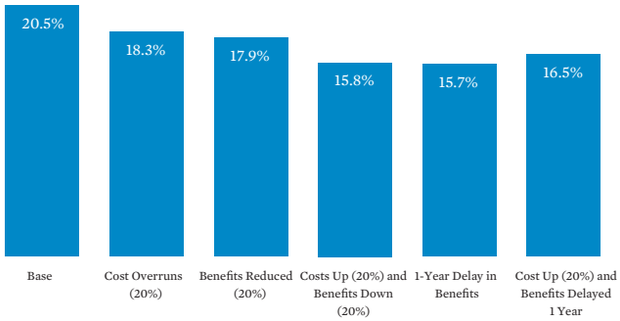
- The shadow exchange rate factor (SERF) used to derive economic values of capital costs from their financial values is 1.09 and this ratio is assumed constant over the period of analysis, and applied to the tradables portion of those capital costs.
- It is assumed that 35% of capital expenditures are tradables.
- A discount rate of 9% is used to calculate the economic net present value.
- Project benefits accrue through 2045.

The base-case EIRR calculation for TVET is presented in Tables 24.1. With total capital expenditures in 2018–2019 of RM15.5 million and annual operating costs of RM2 million, the EIRR for TVET in Sabah is computed as 20.5%. The net present value, which is calculated as the difference between the present value of cash inflows and outflows, discounted at 9%, is equal to just over RM52.4 million measured in 2016 prices over the 30-year period of analysis. The discounted cash flow over the 30-year period is shown in Figure 24.5.

The economic benefit–cost ratio is the ratio of the TVET benefits relative to monetary costs. Since the general rule-of-thumb is that benefits that exceed costs indicate a worthwhile investment, the 2.1 ratio suggests a robust investment for the industry in general. Payback occurs in 2024, 8 years after the initial investment, which suggests a moderate breakeven point.

Table 24.1 and Figure 24.6 present the results of the sensitivity analysis tested for the effects of negative changes in key parameters. The analysis shows that TVET generally remains economically viable in the face of various shortfalls in the growth of TVET capacity during the period of analysis.

Figure 24.6. Economic Internal Rate of Return for TVET under Alternative Scenarios



TVET = technical and vocational education and training.
Source: Calculations by the authors.

24.8 Capacity Building

In addition to capital and operational expenses for the project, technical assistance needs are estimated at $2.0 million–$3.0 million. Capacity development will focus on the following components:

(a) Support development of Sabah's full range of activities in international higher-education and TVET offerings.
(b) Address major external and internal weaknesses and threats to the industry identified in the SWOT analysis described (Section 15.5).
(c) Help to remedy regulatory issues identified by the Malaysia Productivity Corporation, which included the following reforms:[140] (i) reduce delays in issuing visas and passes for international students; (ii) minimize the requirements for international academic staff who have already been accredited in their home country; (iii) reduce delays for the approval of academic programs; (iv) consult with private higher education institutions before introducing new requirements; and (v) reduce the number of agencies involved in approving student visas, international staff working permits, and the introduction of programs by private higher education institutions.

[140] Malaysia Productivity Corporation. 2015. Reducing Unnecessary Regulatory Burden on Business: Private Higher Education. July. Kuala Lumpur.

25

Multi-Destination Tourism

25.1 Rationale

The tourism industry is highly competitive and therefore needs innovative marketing strategies to ensure its long-term advancement in particular destinations. It has long been recognized that bilateral and subregional cooperation in tourism marketing strategies is needed in the light of global market competitiveness, especially to attract long-distance travelers.[141] Strategies covering cross-border marketing networks that promote neighboring territories as a single travel destination can greatly enhance their attractiveness.

The results of a successful multi-destination strategy can have enormous consequences for economic growth and environmental and cultural sustainability. Beyond its direct impact, tourism reaches into other sectors, such as construction, manufacturing, and information and technology (IT) services, thereby producing a multiplier effect along the value chain. It is estimated that for every job in the core tourism sector there is about 1.5 additional or indirect jobs created in the tourism-related economy.[142]

The ASEAN Tourism Strategy Plan 2016–2025 is grounded on regional and subregional collaboration of private sector operators in packaging multi-country nature, cultural, and community-based tourism products and technical expertise. This approach is critical to development of sustainable and inclusive natural and cultural heritage products and related actions in an increasingly competitive global tourism environment.[143]

In the case of the Greater Mekong Subregion (GMS), establishment of a cooperative mechanism has proven to be highly successful. The core strategic thrust of its Regional Tourism Sector Strategy is marketing and product development of multi-country tourism by stimulating demand from high-yield markets and products through joint promotional activities.[144] The approach is based on common human resources development activities and is being implemented throughout the subregion to improve capacities in the GMS tourism sector, as well as develop common opportunities in areas such as travel to pristine forest areas, village communities, diving destinations, and historical sites.

A North Kalimantan–Sabah arrangement can help stakeholders in both territories to gain a competitive advantage and thus enhance sustainability if they can package and market their various attractions more cohesively to attract visitors. North Kalimantan, as a relatively new province, lacks technical expertise in tourism development, has limited financial

[141] P. Theerapappisit. 2004. A Synthesis Paper of the Six Papers: Policy and Planning of Tourism Product Development in Asian Countries for the 6th ADRF General Meeting. Bangkok, Thailand.
[142] World Economic Forum. 2017. *The Travel and Tourism Competitiveness Report 2017*. Geneva.
[143] ASEAN Secretariat. *ASEAN Tourism Strategic Plan 2016–2025*. Jakarta.
[144] ADB. 2008. *Sector Assistance Program Evaluation: Tourism Sector in the Greater Mekong Subregion*. Manila.

resources to promote tourism, and has limited infrastructure outside of Tarakan to support the tourism industry. Likewise, Sabah currently has a very modest visitor advertising and promotion spending state budget of less than RM2,000 per visitor, and needs to increase those expenditures considerably if it is to achieve any acceleration of visitors from its current 5% a year expansion.

Development of multi-destination tourism between Sabah and North Kalimantan will require collaboration between tourism promotion institutions and private tourism associations. There are opportunities to position Sabah and North Kalimantan as a multi-destination travel option to attract opportunities in different natural, historic, and cultural attributes offered in each territory. This requires a willingness and commitment on the part of Sabah and North Kalimantan to coordinate marketing, product development, and investment strategies, while continuing to develop their own unique attractions. The resulting multi-destination tourism can ensure that stakeholders from both territories maximize output from their investments in tourism and related activities.

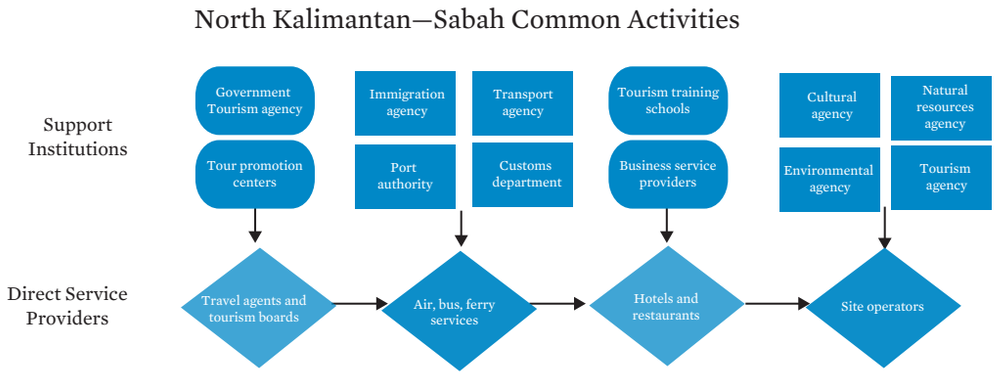
25.2 Cross-Border Value Chain

25.2.1 Project Coverage

The project will provide technical assistance for the development of a cross-border value chain for the tourism industry. The aim of the project will be to develop two-way tourism between Sabah and North Kalimantan as shown in Figure 25.1. It will bolster collaboration between the North Kalimantan Provincial Government and the Sabah State Government, and create an enabling environment for the "support institutions" shown in the figure.

Technical assistance will support the operations of champion individuals or institutions to promote the clustering of activities on both sides of the border to initially support development of supply-chain arrangements, and later the possible integration of company activities across borders in more formal value-chain production and distribution activities.

Figure 25.1. Multi-Destination Tourism Value Chain



Source: Elaborated by the authors.

25.2.2 Indicative Implementation Arrangements

Development of the cross-border value chain for the tourism industry will require that technical assistance be provided to producers on both sides of the border. Technical assistance will support the operations of champion individuals or institutions to promote the clustering of companies on both sides of the border to initially support development of supply-chain arrangements, and later the possible integration of company activities across borders in more formal value-chain production and distribution activities.

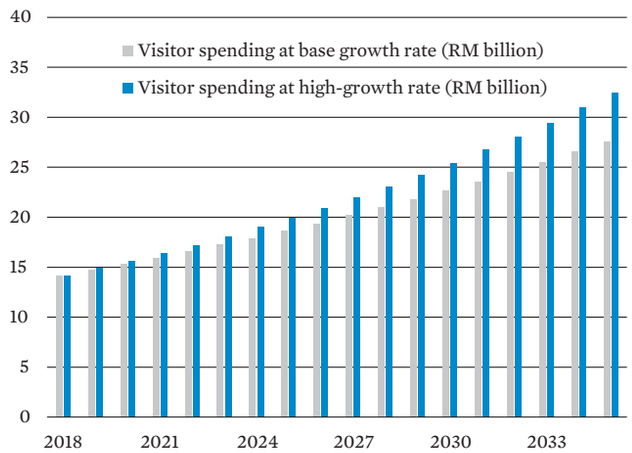
25.2.3 Project Management

The project will be managed by a project steering committee (PSC) for the tourism cross-border value chain, composed equally of public and private sector representatives. In North Kalimantan, the Office of the Governor will be the coordinating agency. In Sabah, the Economic Planning Unit will be the focal agency. In addition to guiding project implementation, the PSC will also be responsible for the monitoring and evaluation of the project.

25.3 Sabah's Tourism Revenue and Cost Forecast

The Sabah Structure Plan 2033 (SSP2033) provides two growth rate scenarios for visitor arrivals in the state: a 5% annual baseline growth rate, and a 6% annual high-growth rate for the number of visitors. If per capita visitor expenditures remain relatively constant, then Figure 25.2 shows the implied forecast for total visitor expenses through 2033 and beyond. It shows tourism receipts increasing from RM14 billion in 2018 to over RM25 billion by 2033 in the base-growth scenario, and nearly RM30 billion by 2033 in the high-growth scenario.

Figure 25.2. Sabah Visitor Spending in Base and High-Growth Scenarios (RM billion)



Source: Derived from Sabah Structure Plan 2033.

To sustain that level of tourism, the Sabah Development Corridor Blueprint proposes to create zoning for diverse needs throughout the state, promote heritage sites, improve urban environment, and implement strategic tourism development policies. Adequate infrastructure aligned with tourism marketing needs to be put into place. That expansion will require considerably more marketing resources than currently exist in Sabah and which, in fact, have been contracting in recent years, according to interviews conducted by the study team with the Sabah Tourism Board.

Estimates of the responsiveness of tourism spending in response to an increase in marketing and promotion spending indicate a relatively small elasticity of 0.046.[145] That means that a 10% increase in the marketing

[145] Webber Quantitative Consulting. 2014. Estimates of the Return on Marketing Investment for Australian Inbound Tourism. Prepared for Tourism Accommodation Australia. July.

and promotion spending would lead to a 0.46% increase in inbound tourism spending. Hence, a 1% acceleration in high-growth tourism over the base scenario would require marketing and promotion spending to sustain a 22% growth over the SSP2033 planning period. The challenge to the government of financing that expansion could be eased if marketing and promotion spending were shared with North Kalimantan to pool resources and considerably expand tourism opportunities.

25.4 Capacity Building

Development of this project needs technical assistance to support champion individuals and institutions that will develop the project. It does not require capital expenditures and therefore cost–benefit analysis for the project. Technical assistance needs are estimated at $2.0 million–$3.0 million. Capacity development will focus on the following components:

(a) Develop two-way tourism between Sabah and North Kalimantan by supporting collaboration between the Sabah State Government and the North Kalimantan Provincial Government and create an enabling environment for support institutions;
(b) Support the operations of champion individuals or institutions to promote the clustering of activities on both sides of the border to initially support development of supply-chain arrangements;
(c) Possibly integrate company activities across borders in more formal value-chain production and distribution activities.

PART IX

Nonmonetarized Project Appraisal

Summary

Traditional cost–benefit analysis is concerned with quantifying benefits and costs in monetary terms and determining the best way to conduct a given project. What is more difficult to capture is nonmonetarized benefits or costs that represent *non-efficiency* concerns such as environmental protection, meeting the population's basic needs, and small business development. To address *nonmonetarized project appraisal*, we need to adopt an iterative process of inter-disciplinary consultations. This approach is now being widely adopted to meet the 17 Sustainable Development Goals. At the Sabah state and the North Kalimantan provincial levels, the process involves a participatory appraisal process in which all stakeholders are interviewed and the results are used to identify priorities, weigh trade-offs, and harmonize interests.

In this part of the study, we elaborate a theory-consistent approach to examining preferences for key nonmonetarized characteristics or aspects of a project by different types of stakeholders. The first stakeholder group consists of government and development institution stakeholders whose objective is to maximize both the commercial viability and socioeconomic welfare effects of a project. The second group consists of large domestic and international companies whose main interest are the project characteristics that help them generate the largest commercial returns. And the third stakeholder group is composed of local households and small businesses that are concerned with project aspects that improve their livelihoods and access to health care, business development services, and transport systems, while alleviating poverty and improving income distribution.

The results of the analysis and ratings for these nonmonetarized objectives are incorporated into the results of the monetarized project appraisal through scaling factors. The methodology involves using a weighting factor > 1 for projects with high non-efficiency rankings in the program, and weighting by a factor of <1 for those project with low rankings for a given stakeholder group.

26

Rating Project Characteristics

26.1 Project Prioritization

The Sabah–North Kalimantan border economic area program seeks to address broad socioeconomic development goals. It needs an integrated rather than piecemeal approach to design and operation. Best international practices suggest an all-inclusive approach to the development of the border area, taking into account interconnected cluster developments in the area. This approach will give rise to a comprehensive networking approach to border development so that economies of scale are derived from complementary cross-border activities and inter-border crossing activities.

In practice, however, technical and financial limitations may prevent the adoption of a comprehensive approach that simultaneously implements the entire program. It suggests the need to prioritize projects which, in and of themselves, would produce practical benefits otherwise not available in an all-inclusive approach. But it might, by its inherently limited approach, be unable to achieve the full benefits of scale economies that could otherwise be derived from a comprehensive approach to border development.

As elaborated in Chapter 5, a possible prioritization of projects depends on the preferences of different stakeholder groups. Those interests can, for example, reflect the socioeconomic welfare of households, local commercial entities, multinational companies, local and national public authorities, or the development agenda of international development institutions. It is therefore inappropriate to simply prioritize projects according to their monetary returns since they are unlikely to consider stakeholder preferences. A weighted sum would be better, but there are many ways to weight project returns and the method selected needs to be justified. Fortunately, economics provides a way to reflect stakeholder preferences that is both theoretically and empirically sound.[146]

Each project discussed in this report has characteristics that benefit stakeholders in various degrees. Stakeholders are therefore likely to prefer certain projects because they have more of the characteristics that benefit them than others. Those characteristics consist of the following:

[146] For a technical explanation of the methodology, see M. Lord and P. Tangtrongjita. 2016. *Border Economic Zones in Thailand: A Practitioner's Guide*. Bangkok: Chulalongkorn University Press.

• Commercial viability	• Knowledge transfer	• Small and medium-sized enterprises (SME) development
• Livelihood improvement of locals	• Integrated value chain	• Border township development
• Use of cheap unskilled labor	• Poverty alleviation	• Health care access
• Use of existing skilled labor	• Industrial estate	• Technical training
• Raw materials access	• Fiscal incentives	• Transport and logistics upgrade

26.2 Summary of Steps

A summary of the steps involved in quantifying stakeholder preferences for border economic area projects follows:

1. Find ratings of project characteristics for each site based on structured questionnaire containing a Likert Scale (normally 1 to 5).
2. Determine the form of stakeholder's utility function for preference ordering (normally Cobb-Douglas function, as discussed in the Technical Annex to this chapter).
3. Establish a baseline solution for the aggregation of project features, based on a neutral preference ordering in which the parameters are all the same and sum to unity.
4. Determine hypothetical or actual preferences based on surveys of stakeholders, classified by major stakeholder groups (public officials on both sides of border, local population, large investors, and others).
5. Assign weights to the parameters of the utility function that reflects the preference ordering of the major stakeholder groups.
6. Calculate the overall ratings and interpret results of different stakeholder groups.

26.3 Stakeholder Groups

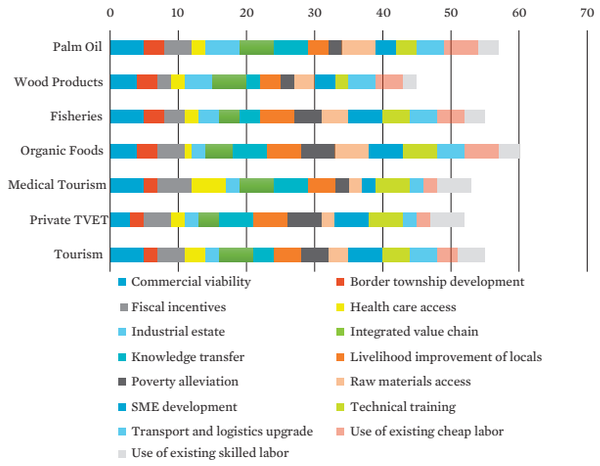
For the Sabah–North Kalimantan border economic area program, we consider three groups of stakeholders with different preference orderings for the prioritization of projects. The following describes the preference orderings of the three groups and their decision process:

- *Stakeholder Group A – Neutral preferences among projects:* In this case, the stakeholder group does not have to be compensated for changes in the amount of a project's characteristic by another one. The stakeholder group could, for example, represent the interests of public authorities that want to develop commercial activities and improve the livelihoods of the local population in ways that extend beyond possible commercially related gains.[147]

[147] Technically, in equation (28.3) of the Technical Annex, all the parameters (α, β, ... ω) of this group's utility function have equal values of 0.077, whose sum equals unity.

- *Stakeholder Group B – Largely commercially oriented preferences for projects*: This stakeholder group prefers to develop those aspects of a project that support commercial activity along the border. The stakeholder group may be composed of large multinationals interested in exploiting cheap labor and abundant raw materials along the border area to improve their competitiveness.
- *Stakeholder Group C – Social welfare maximizing preferences of projects*: This stakeholder group prefers to develop those features that support the social and economic well-being of the population located along the border. The stakeholder group could represent development partners and nongovernment organizations with a mandate to reduce poverty and promote socioeconomic development of low-income areas.

Figure 26.1. Combined Ratings of Major Project Characteristics



SMEs = small and medium-sized enterprises, TVET = technical and vocational education and training.
Source: Elaborated by the authors.

Table 26.1. Ratings of Characteristics in Projects (Scale from 1 [low] to 5 [high])

	Palm Oil	Wood Products	Fisheries	Organic Foods	Medical Tourism	Private TVET	Tourism
Commercial viability	5	4	5	4	5	3	5
Border township development	3	3	3	3	2	2	2
Fiscal incentives	4	2	3	4	5	4	4
Health care access	2	2	2	1	5	2	3
Industrial estate	5	4	3	2	2	2	2
Integrated value chain	5	5	3	4	5	3	5
Knowledge transfer	5	2	3	5	5	5	3
Livelihood improvement of locals	3	3	5	5	4	5	4
Poverty alleviation	2	2	4	5	2	5	4
Raw materials access	5	3	4	5	2	2	3
SME development	3	3	5	5	2	5	5
Technical training	3	2	4	5	5	5	4
Transport and logistics upgrade	4	4	4	4	2	2	4
Use of existing cheap labor	5	4	4	5	2	2	3
Use of existing skilled labor	3	2	3	3	5	5	4

SMEs = small and medium-sized enterprises, TVET = technical and vocational education and training.
Source: Elaborated by the authors.

26.4 Project Ratings

Ratings are based on stakeholder perceptions. Table 26.1 presents them for the seven projects that make up the existing program. The numerical values are based on a scale from 1 (low) to 5 (high) for each of the project characteristics. They are based on discussions held with stakeholders in Sabah and North Kalimantan.

Strong commercial interest exists in the palm oil, fisheries, medical tourism, and conventional and ecotourism. Livelihood improvements occur mostly in organic foods, fisheries, technical and vocational education and training (TVET) and, to a somewhat lessor extent, tourism. Similarly, organic foods and TVET are more likely to alleviate poverty than other projects. Also, SME development is closely associated with fisheries, organic foods, technical training, and tourism. Also noteworthy is the knowledge transfer that is especially associated with palm oil, organic foods, medical tourism, and TVET.

Overall, the projects having the largest combined benefits are organic foods, followed by palm oil, fisheries, and tourism (Figure 26.1).

Technical Annex

The preference ordering of a group of representative stakeholders (for example, development partners, multinationals, small businesses, local communities) can be represented by a *utility function* that takes the following form:

$$U(X_1, \ldots, X_n) \tag{26.1}$$

Where U represents utility, X is the group of projects numbered from 1 to *n*. For example, X_1 can represent the gain obtained from the "industrial park" feature of the project, denoted X_2 the gain obtained from the "value chain" feature, and so forth.

Utility is an abstract measure of benefits obtained from a stakeholder group. Since it cannot be measured directly, it is inferred by "revealed preferences" that are observed by the compensation that needs to be offered to the stakeholder for substituting one feature for another. We can represent the rate of substitution between two features in such a way that the stakeholder is indifferent between the two as long as that stakeholder is compensated by an amount *d* for the difference between X_1 and X_2:

$$X_1 = dX_2 \tag{26.2}$$

If substitution among project features takes place in the form of a *Cobb-Douglas utility function*, then the utility (or benefits) derived from the project features by a particular stakeholder can be measured according to the following preference ordering:[148]

$$U(X_1, \ldots, X_n) = X_1^{\alpha} X_2^{\beta} \ldots X_n^{\omega} \tag{26.3}$$

The values of the parameters is such that $\alpha + \beta + \ldots + \omega = 1$, that is, the sum of all the parameters equals unity.

This relationship describes an *indifference curve* for a stakeholder because it expresses equal levels of gains for the stakeholder from various combinations of the features. In other words, there is not a single "optimal" value of a project feature such as fiscal incentives within a specific cluster. Instead, when forming part of a cluster, fiscal incentives can be different, as long as they are *compensated* by changing the values of other features. Therefore, various combinations of features can form a cluster, as long as they provide a stakeholder with the same value of overall gains from the cluster.

For example, consider a cluster with only two project features having values of 3.5 and 4.5, respectively. Let $\alpha = 0.4$ and $\beta = (1-\alpha) = 0.6$. Then the indifference curve is represented as follows:

$$U(X_1, X_2) = 3.5^{0.4} * 4.5^{0.6} = 4.1 \tag{26.4}$$

The gains of the cluster for the stakeholder is equal to 4.1 on an overall rating scale ranging from 1 to 5. The stakeholder is indifferent between how much of a project feature, X_1 he

[148] The Cobb-Douglas utility function is a special case of the more general Constant-Elasticity-of-Substitution utility function.

receives, as long as he is compensated for any changes in its size by variations in the amount of X_2 he receives, so that his total benefits equal 4.1 for all combinations of X_1 and X_2.

The rate of substitution among cluster categories underlies much of the analysis in feasibility studies. They essentially extend equation (26.3) to the application of optimization analysis. In the case of border economic zones, the optimization problem involves determining the size of each project feature by valuing each of them and estimating the optimal amount of the combined cluster categories for the stakeholder group, given a budget constraint.

Since the parameters $\alpha, \beta, ..., \omega$ represent the weights of the corresponding features preferred by the stakeholder, we can use equation (26.3) to calculate the overall results of the feature values derived from the survey or other type of assessment for alternative border areas by assigning values to those parameters that would characterize the stakeholder's choices for them.

27

Nonmonetarized Benefits in Project Appraisals

27.1 Consumer Preference Rankings

Following the previous chapter's numerical ratings assigned to various aspects of the selected projects for the Sabah–North Kalimantan border economic area program, we present three sets of results based on stakeholder preference orderings. The first is a ranking based on neutral interests; the second is a ranking for commercial preferences; and the third is a ranking for social welfare improvements of the local population.

- *Stakeholder group A: Neutral preferences among projects*: In this case, the group is indifferent to various aspects of a project, that is, the group gives the same importance, for example to commercial viability and knowledge transfer characteristics of the project. This situation may be the case of the government and development partners who want a broad and neutral project impact in the area.
- *Stakeholder group B: Largely commercially oriented preferences for projects*: The group is likely to be made up of SMEs and large national and multinational companies. For the group's utility function (equation 28.3 in the Technical Annex), the following parameter values have been assigned to project characteristics:
    - For *commercially oriented aspects of a project,* parameter values are 1.5 times higher than those in group A for (a) commercial viability, (b) value chains, (c) use of cheap unskilled labor, (d) use of existing skilled labor, (e) raw materials access, (f) fiscal incentives, and (e) industrial estates.
    - For those project aspects that *benefit both commercial and welfare improving interests*, a parameter value of 0.75 is assigned to (a) knowledge transfer, (b) SME development, (c) technical training, and (d) transport and logistics development.
    - For *welfare-improving aspects of a project*, the residual amount of parameter values has been divided among those cluster categories that focus on socioeconomic improvements of local businesses and the general population: (a) livelihood improvements of local population, (b) poverty alleviation, (c) border township development, and (d) health care access.
- *Stakeholder group C: Social welfare maximizing preferences of projects*: The group's utility function (equation 28.3 in the Technical Annex) has the following parameter values assigned to projects:
    - For *welfare-improving* aspects of a project, parameter values are 1.5 times higher than those in group A for the following cluster categories: (a) livelihood improvements of local population, (b) poverty alleviation, (c) border township development, and (d) health care access. The magnitude of these parameters may not be as high as those preferred by the commercially oriented group because this group also benefits from economic growth from commercial activities. Therefore, the parameter values of the commercially oriented aspects of projects

may still maintain a relative degree of importance, though not as high as those of the commercially oriented group B.

- For those project aspects that *benefit both commercial and welfare-improving interests*, a parameter value of 0.75 is assigned to (a) livelihood improvements of local population, (b) poverty alleviation, (c) border township development, and (d) health care access.
- For *commercially oriented project aspects,* the residual amount of parameter values has been divided among those that focus on: (a) commercial viability, (b) value chains, (c) use of cheap unskilled labor, (d) use of existing skilled labor, (e) raw materials access, (f) fiscal incentives, and (g) industrial estates. The parameter values of these features remain relatively important since economic growth contributes to poverty alleviation and welfare improvements in the local population.

It should be noted that stakeholder group C for general welfare improvements has a more complex weight structure than the other two stakeholder groups. The reason is that there are two channels through which welfare improvements occur:

- The first is through meso-policies aimed at expanding expenditures on learning centers, townships, health, SME development, and other socioeconomic programs. Those are direct welfare-improving mechanisms that can have an immediate or long-term impact on the local population.
- The second is pro-poor growth policies that can take the form of (a) structural adjustment policies and programs to ensure that finance reaches small enterprises, or that liberalization of cross-border transactions reduces trading costs; and (b) regional growth policies to make agriculture and labor-intensive manufacturing more competitive, promote cross-border value chains, and improve investment incentives. These pro-poor policies generate welfare improvements through indirect channels, namely, they improve economic growth in the region, which in turn expands employment and incomes, SME business opportunities, and general living conditions of the local population.

For that reason, project characteristics that have direct welfare-improving effects though meso-policies tend to receive high preference weighting. Nonetheless, pro-poor growth policies and programs that reflect commercially oriented components also receive some preference weighting because of their indirect beneficial effects on welfare improvements in the border economic area.

27.2 Project Rankings

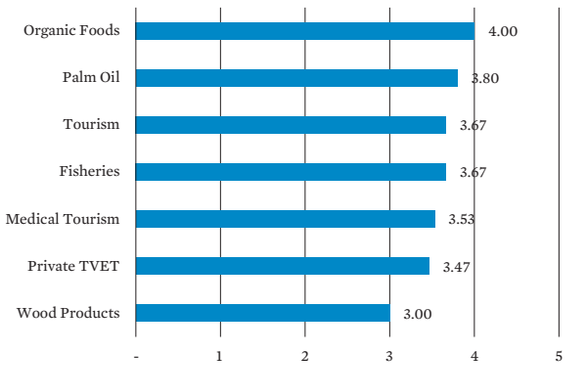
Project rankings are similar for Sabah and North Kalimantan. There is a difference, however, in the project coverage. Sabah has seven projects, while North Kalimantan has five because it excludes two projects that are specific to Sabah, namely, medical tourism and private TVET. Medical tourism is being promoted in Sabah for cross-border commercialization in North Kalimantan and elsewhere. But in North Kalimantan the focus is on extending medical services to the regencies outside of Tarakan. Similarly, private TVET in Sabah is being commercialized to international students, including those in North Kalimantan. In North Kalimantan, however, attention is being directed to bolstering their educational faculty to

serve the needs of the local population. The result is that North Kalimantan's program is focused on four projects that are traded goods (palm oil, wood products, fisheries, and organic agriculture) plus one project that is a traded service, namely, tourism.

27.2.1 Neutral Preferences

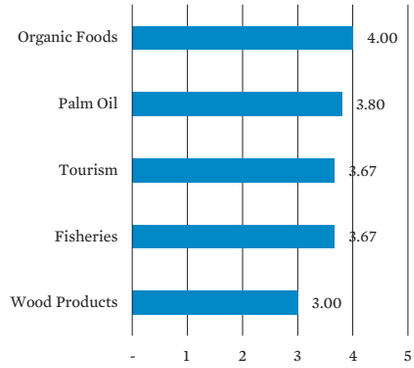
The first ranking for both Sabah and North Kalimantan is based on a simple mean average of the 15 features that describe each project (Figures 27.1 and 27.2). With preferences being neutral, organic foods and palm oil are the highest rated projects, while wood products and private TVET are the lowest ones. Organic agriculture is the highest rated project because it has a huge commercial growth opportunity, is ideally suited for relatively small household agricultural operations, it uses both an abundance of skilled and unskilled labor in its value chain, there is an abundance of knowledge, and it is part of an integrated value chain that extends from "farm to fork" in the various processes along the food chain, from agricultural production to consumption.

Figure 27.1. Sabah Project Rankings Based on Mean Average of Their Key Features



TVET = technical and vocational education and training.
Source: Elaborated by the authors.

Figure 27.2. North Kalimantan Project Rankings Based on Mean Average of Their Key Features



Source: Elaborated by the authors.

Palm oil is also ranked high because of its commercial features related to having an integrated value chain with strong commercial viability, use of both skilled and unskilled labor, development of industrial estates, and potential to transfer knowledge from downstream activities in Sabah to North Kalimantan oil palm plantation owners so that they can add value to their products. The project's ability to improve social and economic welfare through livelihood improvements, poverty alleviation, and other channels is, however, low.

The tourism and fisheries projects have the same relatively high ranking because they provide both commercial and socioeconomic welfare benefits. Tourism has high ratings for its features related to commercial viability, integrated value chain, SME development, and somewhat lower ratings for development of skilled labor, technical training, poverty alleviation, and livelihood improvements, and ability to promote better transport and logistics.

Fisheries also has a strong commercial viability, as well as promotion of SME activities throughout the industry's value chain. It also generates employment for unskilled and semiskilled workers, provides training opportunities, transport and logistics development, and helps to promote livelihoods of the local population.

Medical tourism has a number of highly rated features. They refer especially to its commercial viability, dissemination of health care for North Kalimantan people, strong value-chain linkages along the entire medial and tourism knowledge transfer and technical training. But its overall ranking is weighted down by its low ratings in other project features, such as poverty alleviation, ability to generate employment for unskilled workers, and other features that help the local population with relatively low income.

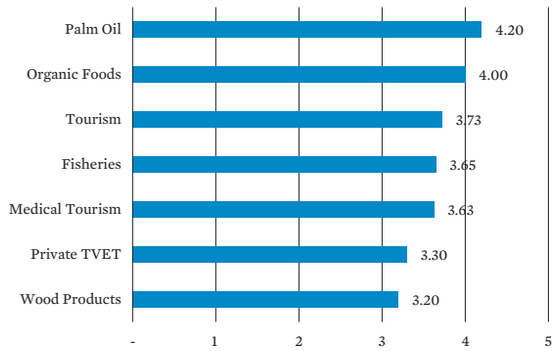
Similarly, private TVET and higher education has highly rated features related to knowledge transfer, use of skilled professional, technical training, and development of SMEs in the educational sector. However, private educational facilities are often outside the reach of a large portion of the local population that lack the financial wherewithal to access such services.

The wood-product project is the lowest rated project for both Sabah and North Kalimantan. Its only high rating is for its value-chain feature. Its downstream activities in the furniture industry is one of the most dynamic global markets and there is strong interest in Indonesian and Malaysian furniture, plywood, veneers, containers, flooring, trusses, manufactured homes and prefabricated wood buildings. However, with the need to develop sustainable plantation wood supplies, the focus is on large industrial estates and large companies that are able to finance the relatively long production cycle. In this project, therefore, opportunities for local livelihood improvements are limited, as are other socioeconomic features.

27.2.2 Commercial Preferences

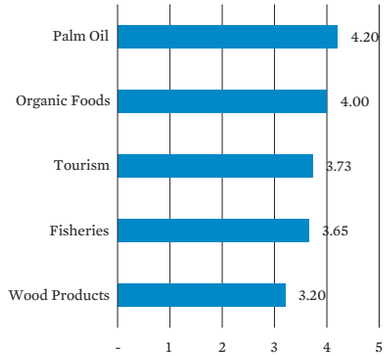
For stakeholders with commercial interests, palm oil takes the lead in the program's set of projects (Figures 27.3 and 27.4). Nearly all of the palm oil project's commercial features are assigned the maximum rating of 5 points. These features refer to commercial viability,

Figure 27.3. Sabah Project Rankings with Preferences Given to Commercial Interests



TVET = technical and vocational education and training.
Source: Elaborated by the authors.

Figure 27.4. North Kalimantan Project Rankings with Preferences Given to Commercial Interests



Source: Elaborated by the authors.

use of skilled and unskilled labor, use of natural resources, industrial estates, value-chain development, and knowledge transfer. Transport and logistics upgrading and development also rate high as project features. In contrast, relatively low ratings are assigned to welfare-improving features like local livelihood development, poverty alleviation, and border town development.

Organic agriculture ranks second among the stakeholders with commercial interests. Although commercial aspects are not uniformly rated at their maximum scores, there are a number of socioeconomic aspects of the project that are rated high, namely, local livelihood improvements and poverty alleviation. Organic farming is often carried out in small land holdings because of their need for labor-intensive production activities. Knowledge transfer, skills training, SME development in downstream activities, and integrated value-chain development are all rated high in this project.

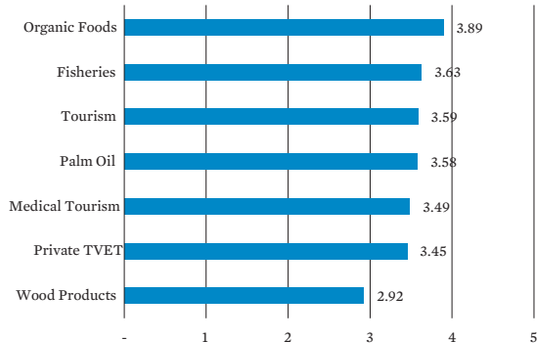
Tourism, including ecotourism that is closely related to organic agriculture, is also rated among the top commercially oriented projects for this group of stakeholders. Like organic agriculture, it benefits from high ratings from both strong commercial potential and the ability to improve the local community's socioeconomic welfare.

The remaining projects—fisheries, medical tourism, wood products, and private TVET and higher education—all share similar rankings as in the stakeholder group having neutral preferences. The fisheries project in particular has both commercial potential and welfare-improving characteristics. In contrast, the projects for medical tourism, wood products, and private TVET and higher education tend to have strong commercial development characteristics, but relatively low ratings for welfare improvements of the medium- to low-income population segments.

27.2.3 Welfare-Improving Preferences

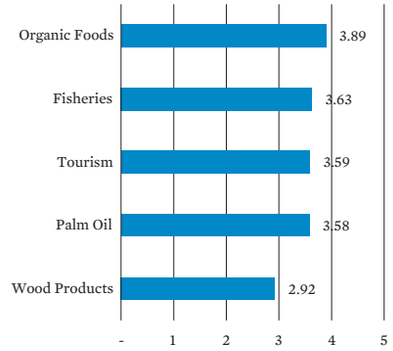
For stakeholders having social welfare maximizing preferences, the top rated project is organic agriculture and agri-food processing (Figures 27.5 and 27.6). This project has both

Figure 27.5. Sabah Project Rankings with Preferences Given to Welfare Improvements



TVET = technical and vocational education and training.
Source: Elaborated by the authors.

Figure 27.6. North Kalimantan Project Rankings with Preferences Given to Welfare Improvements



Source: Elaborated by the authors.

robust commercial opportunities and can benefit the local population because of its use of small-scale, labor-intensive production methods.

Fisheries also ranks high among the program's projects because of its strong commercial viability, extensive use of SMEs, and ability to improve local livelihoods. It also has favorable features related to employment generation, knowledge transfer and technical training for downstream activities, and promotion of transport and logistics development.

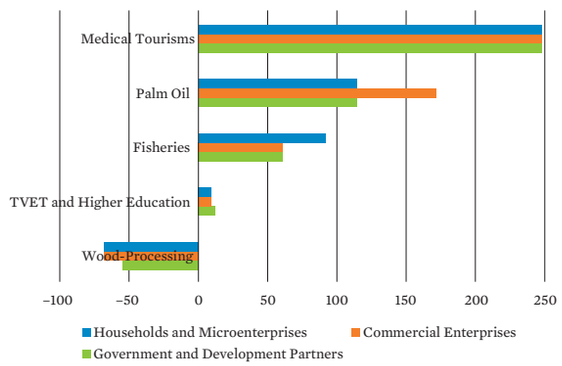
In contrast, palm oil ranks much lower for this stakeholder group than the other two groups because of its bias toward aspects that benefit large commercial interests. Similarly, medical tourism and private TVET and higher education are unlikely to benefit medium- to low-income groups, especially in North Kalimantan.

27.3 Incorporating Nonmonetarized Ratings into Project Appraisals

The results of the analysis and ratings for nonmonetarized objectives can be incorporated into the results of the monetarized cost–benefit analysis through scaling factors. The methodology involves using a weighting factor >1 for projects with high rankings in the program, and weighting by a factor of <1 those projects with low rankings for each stakeholder group. In particular, we assign a factor of 1.5 for the top-rated projects of each stakeholder group, a factor of 1.0 for the middle-rated projects, and a factor of 0.75 for the bottom rated projects.[149]

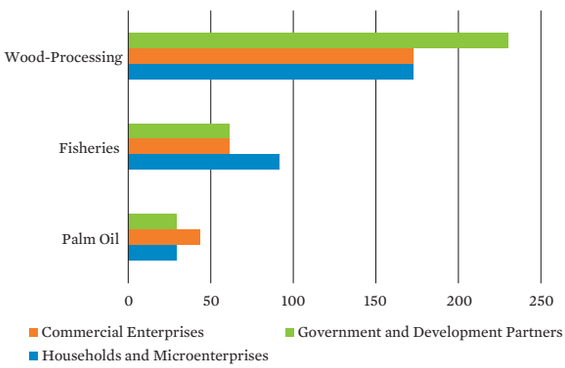
For Sabah, Figure 27.7 shows the combined monetarized and nonmonetarized economic net present value (ENPV) value equivalents. Valuation is in millions of US dollars, discounted at

Figure 27.7. Sabah's Projects: Monetarized and Nonmonetarized ENPV Equivalents ($ million, discounted at 9%)



ENPV = economic net present value.
Source: Elaborated by the authors.

Figure 27.8. North Kalimantan's Projects: Monetarized and Nonmonetarized ENPV Equivalents ($ million, discounted at 9%)



ENPV = economic net present value.
Source: Elaborated by the authors.

[149] For more details about the steps involved in the calculations, see Chapter 12: Adjusted Cost–Benefit Analysis in Australian Transport Assessment and Planning. 2016. Assessment and Planning. Category 4: Tools and Techniques. September. https://atap.gov.au/tools-techniques/cost-benefit-analysis/13-adjusted-cost-benefit-analysis.aspx.

9%. The major difference occurs in palm oil, where the project's nonmonetarized features are rated high by commercial interests. In contrast, households and SMEs rank high for the nonmonetarized features of the fisheries project, with the result that the combined monetarized and nonmonetarized ENPV value equivalents significantly exceed those of the monetarized ENPVs. Finally, both low- and medium-income households and commercial interests have relatively low rankings for wood products and private TVET. As a result, the nonmonetarized and monetarized ENPV value equivalents are lower than the monetarized ENPVs.

For North Kalimantan, Figure 27.8 shows a similar pattern to that of Sabah. The wood products project is ranked relatively low by both commercial interests and households, with the result that the monetarized and nonmonetarized ENPV value equivalents are lower than those of the simple monetarized ENPV. In contrast, households and microenterprises rank the fisheries project high, so that their monetarized and nonmonetarized ENPV value equivalents are higher than those of the simple monetarized ENPVs. In palm oil, commercial enterprises rank the project high. As a result, their monetarized and nonmonetarized ENPV value equivalents are higher than those of the simple monetarized ENPVs.

PART X

Overall Program Appraisal

Summary

Since the Sabah–North Kalimantan border economic area program is composed of several projects, we can jointly analyze the entire program as a single investment and evaluate its economic viability accordingly. A common implementation time frame is used and duplicate capital and operating costs for factor inputs or infrastructure are counted as costs that are common to all projects.

The results are as follows:

- For Sabah, the analysis of the overall program indicates an economic internal rate of return (EIRR) of 22.6%, with the economic net present value (ENPV) discounted at 9% equal to $547 million. The economic benefit–cost ratio (EBCR) is 1.9. Sensitivity analysis suggests that the program remains economically viable in the face cost overruns, benefits reductions, and a combination of both effects.
- For North Kalimantan, the overall program has an EIRR of 22.1%; an ENPV of $318 million; and an EBCR of 2.0. Sensitivity analysis also indicates that the program remains viable under cost overruns, benefit reductions, and a combination of both effects.

The existence of duplicate factor input and infrastructure costs across projects that can be counted as single costs within the overall program give rise to economies of scale that are otherwise nonexistent within individual projects. Such is the case with the construction of the paved road on the Sabah side, from the border town of Serudong to the town of Kalabakan, located on the paved road linking the city of Tawau to the Interior District. The Serudong–Kalabakan paved road would contribute $223 million to Sabah's cross-border merchandise exports; and it would contribute $256 million to North Kalimantan's cross-border merchandise exports over the project time frame.

28

Program Viability

28.1 Common Assumptions

The program's economic viability requires that its project components generate net economic benefits that will be sustained during the economic life of the projects. When several interrelated projects are combined into a single program, the project mix, or cluster, needs to be jointly evaluated.[150] One reason is the possible existence of economies of scale, which arise when operational synergies or efficiencies produce more benefits or output with fewer costs. More formally, scale economies are created because average cost decline when projects share one or more factor inputs. In the case of the current Sabah–North Kalimantan program, economies of scale occur because of shared nonfactor input in the form of construction costs for the road linking Sabah and North Kalimantan in both the palm oil and wood products projects.

Table 28.1. Summary of Sabah's Economic Internal Rate of Return and Sensitivity Analysis

Item			EIRR (%)	ENPV at 9% ($ million)	EBCR (ratio)
Subprojects					
No.	**Acronym**	**Description**			
1	MEDT	Medical Tourism	21.9%	248	1.7
2	TVET	TVET and Higher Education	20.5%	12	2.1
3	POIL	Palm Oil	18.0%	114	1.9
4	WOOD	Wood-Processing	3.7%	(55)	0.7
5	FISH	Fisheries	20.0%	61	2.9
Whole Project					
(a)	Base Estimate		22.6%	547	1.9
(b)	Benefits Reduced by 10%		19.8%	430	1.7
(c)	Cost Overrun of 10%		20.0%	485	1.7
(d)	10% Cost Increase and Benefits Reduction		17.5%	367	1.5

( ) = negative, EBCR = economic benefit–cost ratio, EIRR = economic internal rate of return, ENPV = economic net present value, TVET = technical and vocational education and training.
Source: Elaborated by the authors.

[150] ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila. http://dx.doi.org/10.22617/TIM178607-2.

Table 28.2. Economic Internal Rate of Return and Sensitivity Analysis

	Benefits ($ million)						Costs ($ million)						
	MEDT	TVET	POIL	WOOD	FISH	Total	Capital Costs	O&M	Total	Net Benefits	Benefits Decline 10%	Cost Overrun 10%	10% Cost Increase and Benefits Reduction
2018	32.5	0.0	-	0.0	0.0	32.5	141.3	20.2	161.4	(129.0)	(132.2)	(145.1)	(148.4)
2019	35.4	0.0	-	0.0	4.2	39.6	104.2	20.2	124.4	(84.8)	(88.7)	(97.2)	(101.2)
2020	38.6	0.0	-	0.0	8.4	47.0	115.1	20.2	135.3	(88.3)	(93.0)	(101.8)	(106.5)
2021	42.0	0.1	37.0	13.5	12.6	105.2	40.5	25.6	66.1	39.1	28.5	32.5	21.9
2022	45.8	0.2	37.0	13.5	16.8	113.2	5.6	31.0	36.6	76.7	65.3	73.0	61.7
2023	48.6	0.3	37.0	13.5	21.0	120.4	0.0	31.0	31.0	89.4	77.3	86.3	74.2
2024	51.5	0.6	37.0	13.5	21.0	123.5	0.0	31.0	31.0	92.5	80.2	89.4	77.1
2025	54.6	0.9	37.0	13.5	21.0	126.9	0.0	31.0	31.0	95.9	83.2	92.8	80.1
2026	57.9	1.2	37.0	13.5	21.0	130.5	0.0	31.0	31.0	99.5	86.5	96.4	83.4
2027	60.8	1.5	37.0	13.5	21.0	133.7	0.0	31.0	31.0	102.7	89.4	99.6	86.3
2028	63.8	1.9	37.0	13.5	21.0	137.1	0.0	31.0	31.0	106.1	92.4	103.0	89.3
2029	67.0	2.3	37.0	13.5	21.0	140.7	0.0	31.0	31.0	109.7	95.6	106.6	92.5
2030	70.3	2.7	37.0	13.5	21.0	144.5	0.0	31.0	31.0	113.5	99.0	110.4	95.9
2031	73.8	3.1	37.0	13.5	21.0	148.4	0.0	31.0	31.0	117.4	102.6	114.3	99.5
2032	77.5	3.5	37.0	13.5	21.0	152.5	0.0	31.0	31.0	121.5	106.3	118.4	103.2
2033	80.6	4.0	37.0	13.5	21.0	156.1	0.0	31.0	31.0	125.1	109.5	122.0	106.4
2034	83.9	4.5	37.0	13.5	21.0	159.8	0.0	31.0	31.0	128.8	112.8	125.7	109.7
2035	87.2	5.0	37.0	13.5	21.0	163.7	0.0	31.0	31.0	132.7	116.3	129.6	113.2
2036	90.7	5.6	37.0	13.5	21.0	167.7	0.0	31.0	31.0	136.7	120.0	133.6	116.9
2037	94.3	6.0	37.0	13.5	21.0	171.8	0.0	31.0	31.0	140.8	123.6	137.7	120.5
2038	97.2	6.4	37.0	13.5	21.0	175.0	0.0	31.0	31.0	144.0	126.5	140.9	123.4
2039	100.1	6.6	37.0	13.5	21.0	178.1	0.0	31.0	31.0	147.1	129.3	144.0	126.2
2040	103.1	6.7	37.0	13.5	21.0	181.3	0.0	31.0	31.0	150.3	132.1	147.2	129.0

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Table 28.2 *continued*

	Benefits ($ million)						Costs ($ million)						
	MEDT	TVET	POIL	WOOD	FISH	Total	Capital Costs	O&M	Total	Net Benefits	Benefits Decline 10%	Cost Overrun 10%	10% Cost Increase and Benefits Reduction
2041	106.2	6.7	37.0	13.5	21.0	184.4	0.0	31.0	31.0	153.4	134.9	150.3	131.8
2042	109.4	6.7	37.0	13.5	21.0	187.5	0.0	31.0	31.0	156.5	137.8	153.4	134.7
2043	100.4	6.7	37.0	13.5	21.0	178.6	0.0	31.0	31.0	147.6	129.8	144.5	126.7
2044	82.7	6.7	37.0	13.5	21.0	160.9	0.0	31.0	31.0	129.9	113.8	126.8	110.7
2045	63.7	6.7	37.0	13.5	21.0	141.9	0.0	31.0	31.0	110.9	96.7	107.8	93.6
2046	43.3	6.7	37.0	13.5	21.0	121.5	0.0	31.0	31.0	90.5	78.4	87.4	75.3
2047	21.6	8.2	37.0	13.5	21.0	101.3	0.0	31.0	31.0	70.3	60.1	67.2	57.0
	20.1	8.5	37.0	13.5	21.0	100.1	0.0	31.0	31.0	69.1	59.1	66.0	56.0
						Economic Internal Rate of Return =				**22.6%**	**19.8%**	**20.0%**	**17.5%**
						Economic Net Present Value at 9% =				**547.4**	**429.9**	**484.6**	**367.08**
						Economic Benefit–Cost Ratio =				**1.87**	**1.68**	**1.70**	**1.53**

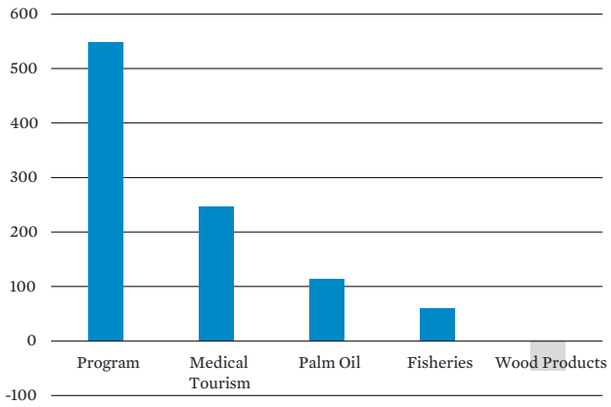
( ) = negative, FISH = fisheries, MEDT = medical tourism, POIL = palm oil, TVET = technical and vocational education and training, WOOD = wood-processing.
Source: Elaborated by the authors.

Common assumptions underlying the program's economic analysis are similar to those for the individual projects: (i) operating and maintenance costs are spread evenly across the duration of project implementation, unless otherwise noted; (ii) the proportion of tradable inputs in capital and operating expenditures is 35% of the total; (iii) a standard conversion factor of 1.08 is applied to tradables; (iv) project benefits accrue over a 30-year period to ensure the full realization of economic benefits; and (v) a discount rate of 9% is used to calculate the economic net present value (ENPV) and the economic benefit–cost ratio (EBCR).

28.2 Sabah

The base-case economic internal rate of return (EIRR) calculations for the subprojects and entire program are presented in Tables 28.1 and 28.2.[151] The EIRR is computed at 22.6% for the overall program. Shared road and customs, immigration, quarantine, and security (CIQS) infrastructure costs for palm oil and wood processing generate economies of scale, which expand net benefits by 3.0 percentage points. For subprojects, the returns are 21.9% for medical tourism, 20.5% for TVET and higher education, 18.0% for palm oil, 3.7% for wood processing, and 20% for fisheries.

Figure 28.1. Economic Net Present Value of Sabah ($ million)



Source: Calculations by the authors.

The second part of Tables 28.1 and 28.2 presents the results of the sensitivity analysis that tested for the effects of changes in key parameters. The findings show that the program remains economically viable in the face of a 10% cost overrun (20%), a 10% benefits reduction (19.8%), and both a 10% cost reduction and cost overrun (17.5%).

The economic net present value, discounted at 9%, is equal to $547 million. Because of scale economies, the combined economic net present value is greater than the sum of its project components. Among the individual projects, medical tourism has the largest ENPV, followed by palm oil and fisheries. TVET has a relatively small ENPV, while that of wood products is negative (Figure 28.1).

28.3 North Kalimantan

The base-case EIRR calculations for the subprojects and entire program are presented in Tables 28.3 and 28.8. The EIRR is computed at 22.1% for the overall project. For subprojects, the returns are 16.5% for palm oil, 25.5% for timber, and 20% for fisheries. Economies of scale in the overall program are generated by the shared road and CIQS infrastructure costs for palm oil and wood processing, which expand net benefits by over 2.0 percentage points.

[151] The results refer to the monetarized project appraisal.

Table 28.3. Summary of North Kalimantan's Economic Internal Rate of Return and Sensitivity Analysis

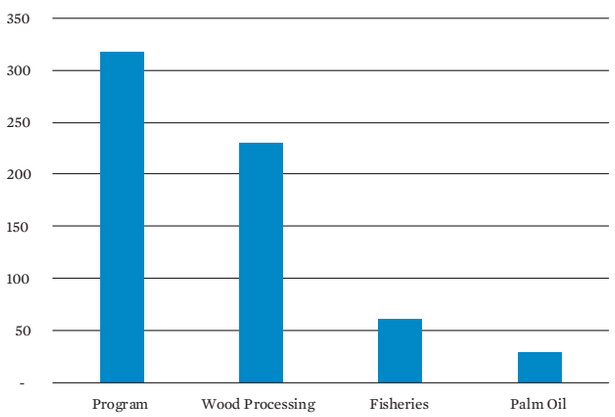
Item			EIRR (%)	ENPV at 9% ($ million)	EBCR (ratio)
Subprojects					
No.	Acronym	Description			
1	POIL	Palm Oil	16.5%	29.2	1.5
2	WOOD	Wood-Processing	25.5%	230.4	2.5
3	FISH	Fisheries	20.0%	61.0	1.6
Whole Project					
(a)	Base Estimate		22.1%	318.2	2.0
(b)	Benefits Reduced by 10%		19.7%	254.8	1.8
(c)	Cost Overrun of 10%		19.9%	286.6	1.8
(d)	10% Cost Increase and Benefits Reduction		17.6%	223.1	1.6

EIRR = economic internal rate of return, ENPV = economic net present value, EBCR = economic benefit–cost ratio.
Source: Elaborated by the authors.

The second part of Tables 28.3 and 28.4 presents the results of the sensitivity analysis for the effects of changes in key parameters. The findings show that the program remains economically viable in the face of a 10% cost overrun (19.9%), a 10% benefits reduction (19.7%), and a combination of 10% cost increase and benefits reduction (17.6%).

The economic net present value, discounted at 9%, is equal to $318 million. Among the individual projects, wood processing has the largest ENPV, followed by fisheries and palm oil (Figure 28.2).

Figure 28.2. Economic Net Present Value of North Kalimantan ($ million)



Source: Calculations by the authors.

Table 28.4. North Kalimantan's Economic Internal Rate of Return and Sensitivity Analysis

	Benefits ($ million)				Costs ($ million)						
	POIL	WOOD	FISH	Total	Capital Costs	O&M	Total	Net Benefits	Benefits Decline 10%	Cost Overrun 10%	10% Cost Increase and Benefits Reduction
2018	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	4.2	4.2	127.2	0.0	127.2	(123.0)	(123.5)	(135.8)	(136.2)
2020	0.0	0.0	8.4	8.4	138.2	0.0	138.2	(129.8)	(130.7)	(143.7)	(144.5)
2021	0.0	50.6	12.6	63.2	40.5	5.4	45.9	17.4	11.0	12.8	6.4
2022	11.2	50.6	16.8	78.6	0.0	10.0	10.0	68.6	60.8	67.6	59.8
2023	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2024	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2025	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2026	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2027	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2028	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2029	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2030	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2031	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2032	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2033	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2034	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2035	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2036	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2037	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6

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Table 28.4 *continued*

	Benefits ($ million)				Costs ($ million)						
	POIL	WOOD	FISH	Total	Capital Costs	O&M	Total	Net Benefits	Benefits Decline 10%	Cost Overrun 10%	10% Cost Increase and Benefits Reduction
2038	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2039	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2040	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2041	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2042	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2043	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2044	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2045	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2046	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
2047	11.2	50.6	21.0	82.8	0.0	10.0	10.0	72.8	64.6	71.8	63.6
				Economic Internal Rate of Return =				**22.1%**	**19.7%**	**19.9%**	**17.6%**
				Economic Net Present Value at 9% =				**318.1**	**254.6**	**286.5**	**223.0**
				Economic Benefit–Cost Ratio =				**2.01**	**1.80**	**1.82**	**1.64**

AFISH = fisheries, POIL = palm oil, WOOD = wood-processing.
Source: Elaborated by the authors.

29

Road Connectivity: Impact Analysis

29.1 Importance

Transportation infrastructure is the single most important factor affecting commercial activity between Sabah and North Kalimantan, especially in palm oil, wood products, conventional and organic agriculture, agri-processing, and tourism. Air and sea transportation is expensive and unreliable, while existing land transportation across the border largely consists of rudimentary dirt or gravel roads that are often impassable when it rains. A paved road only exists on the North Kalimantan side, between Simenggaris and the border along Sabah's Tawau District.

North Kalimantan's major road system traverses the central area of the province and extends from the border with East Kalimantan to Sabah's border. There is also a western border road that connects to Sabah's Interior Division at the border town of Tau Lumbis, as well as Sarawak state of Malaysia at the border town of Long Midang. The road from Simanggaris to the Tawau District border with Sabah is being built under ADB's Regional Roads Development Project (ADB Loan 2817-INO), and will be completed in 2018.[152]

North Kalimantan's road maintenance is also critical to the border economic area development program's success. The existing road network through North Kalimantan is heavily damaged from heavy truck traffic carrying logs and oil palm fresh fruit bunches (FFB). The current cost estimate for road maintenance from Simanggaris to the Tawau District border with Sabah allocates 3% of the total capital expenditures for construction of the road. In particular, capital expenditures are calculated as the proportion of the road from Simanggaris to the border relative to the total of 476 kilometers of road construction being financed by the overall $245 million ADB loan.

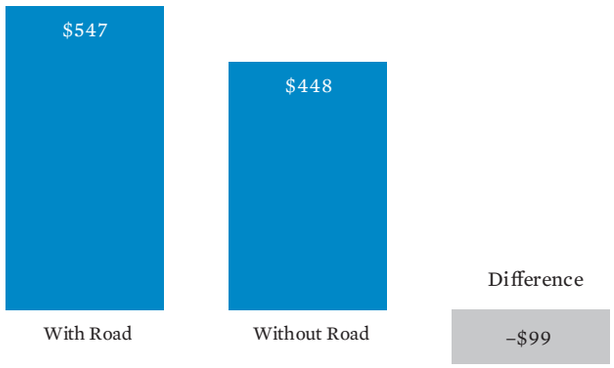
On Sabah's side of the border, there is only a dirt road from the border town of Serudong to the town of Kalabakan, which is located on the paved road linking the city of Tawau to the Interior District. As mentioned earlier, construction of the Serudong–Kalabakan paved road of 45 kilometers would cost an estimated $160 million for both the road paving and construction of a CIQ facility at the border. Under the Sabah Structure Plan 2033, the existing dirt road will be converted to a single paved carriageway and later upgraded to a dual carriageway. However, construction of the road remains uncertain, according to the Economic Planning Unit. The state budget may prioritize other networks, leaving Sabah's roadway to North Kalimantan with an uncertain future.

[152] ADB. 2008. *Technical Assistance Report: Republic of Indonesia: Preparing the Regional Roads Development Project* (Financed by the Japan Special Fund) (Project Number 38479). Manila. https://www.adb. org/sites/default/files/project-document/65174/38479-ino-tar.pdf.

Without an adequate road on the Malaysian side, transport costs for North Kalimantan timber and oil palm producers will continue to undermine competitiveness of key industries on both sides. Timber transport costs constitute a sizeable part of the wood-product industry's raw material costs and have a major influence on the sector's commercial viability. In fact, depending on fuel costs and haul distance, the transportation of wood from harvest site to processing facility can account for up to 50% of total harvest cost.

Similarly, oil palm farmers need to truck the fruit to seaports, load it onto barges for shipment to Tawau or Lahad Datu, and then transfer it to trucks for transport to mills. According to North Kalimantan plantation managers' report to the authors of this study, the indirect sea route can add 10 or more percentage points to the farm-gate price of the fresh fruit bunch. Transport cost is consequently the single most crucial factor affecting the competitiveness of North Kalimantan oil palm producers. Construction of a paved road from the town of Simanggaris to the border crossing and then from Kalabakan on the Sabah side of the border to the town of Serudong in Tawau District would substantially reduce transport costs between North Kalimantan and Sabah.

Figure 29.1. Impact of Cross-Border Road Construction on Program's Economic Net Present Value for Sabah Goods and Services
($ million)



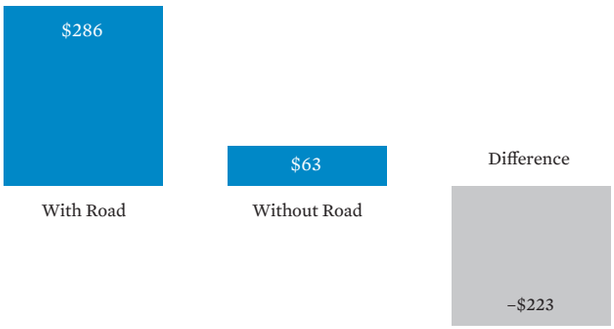
Source: Calculations by the authors.

29.2 Sabah

For Sabah's cross-border trade in goods and services, construction of the road between Kalabakan and Serudong has a moderate impact on the state's returns on the overall program. The economic net present value is reduced by $99 million over the program's valuation period (Figure 29.1). That amount represents 18% of the program's net benefits from cross-border trade in goods and services.

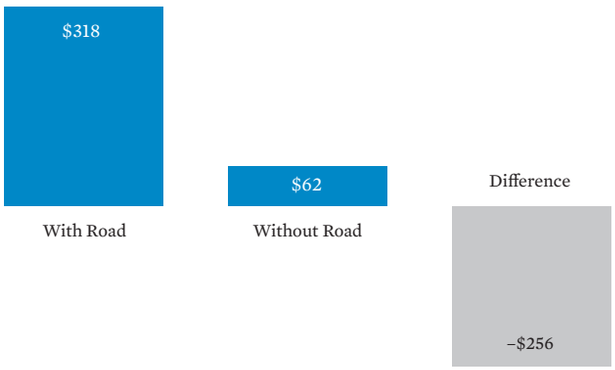
Services trade in both medical tourism and TVET are, however, broad projects for the state and are not specific to trade with North Kalimantan. If we exclude these types of services trade and instead only focus on cross-border trade in goods, then the impact of the road is much greater. In that situation, the economic net present value without the road being constructed is nearly 80% lower than with the road being constructed (Figure 29.2).

Figure 29.2. Impact of Cross-Border Road Construction on Program's Economic Net Present Value for Sabah Goods
($ million)



Source: Calculations by the authors.

Figure 29.3. Impact of Cross-Border Road Construction on Program's Economic Net Present Value for North Kalimantan
($ million)



Source: Calculations by the authors.

29.3 North Kalimantan

Construction of the road on the Sabah side of the border is also important for North Kalimantan. Without the road, neither the oil palm nor wood product industries benefit from the border economic area program. In that case, economic net present value is only $62 million, which is 80% lower than with the road construction (Figure 29.3). All the gains accrue exclusively to the fisheries industry, which does not rely on the construction of the road.

There are, of course, other cross-border value chains that rely on capacity building rather than capital investments. These projects consist of organic foods and tourism, including ecotourism. Both would benefit from the road construction, but their project benefits do not rely on the road since they can use both air and sea transport modes.

PART XI

Execution Strategy

Summary

The transformation of simple border crossings into full-fledged border economic areas will require an integrated spatial planning approach that extends well beyond purely local or district policies. Moreover, development on one side of the border will, sooner or later, need collaboration with adjacent territories.

Efforts are already underway to establish quasi-formal trading arrangements between Sabah and North Kalimantan. In April 2017, the Society Empowerment and Economic Development of Sabah signed a memorandum of understanding with KADIN (Kamar Dagang dan Industri Indonesia), a body that represents the various trade associations in Indonesia, establishing a framework of cooperation on trade-related programs between Sabah and North Kalimantan.

Implementation of the Sabah–North Kalimantan border economic area will depend on the weighted preferences of local and central government officials, the private sector, and the local population in each territory, as well as socioeconomic characteristics of projects. As such, a stepwise progression is suggested for advancing the program. Moving forward from this study, the next step would involve a full-fledged feasibility study with detailed costing and benefits for each flagship project. Program execution would then follow under well-defined management and supervision, with periodic reviews and a monitoring and evaluation framework. In all cases, the path forward should follow a fully integrated approach to the border economic area design and implementation.

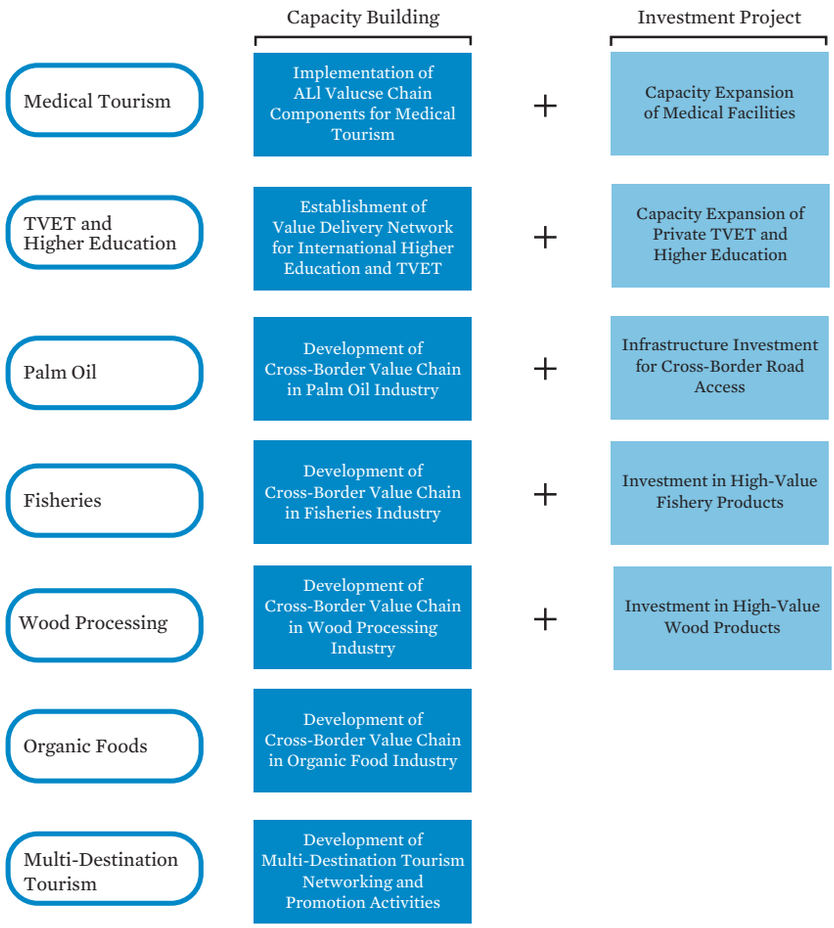
30

Program Implementation

30.1 Advancing Program Components

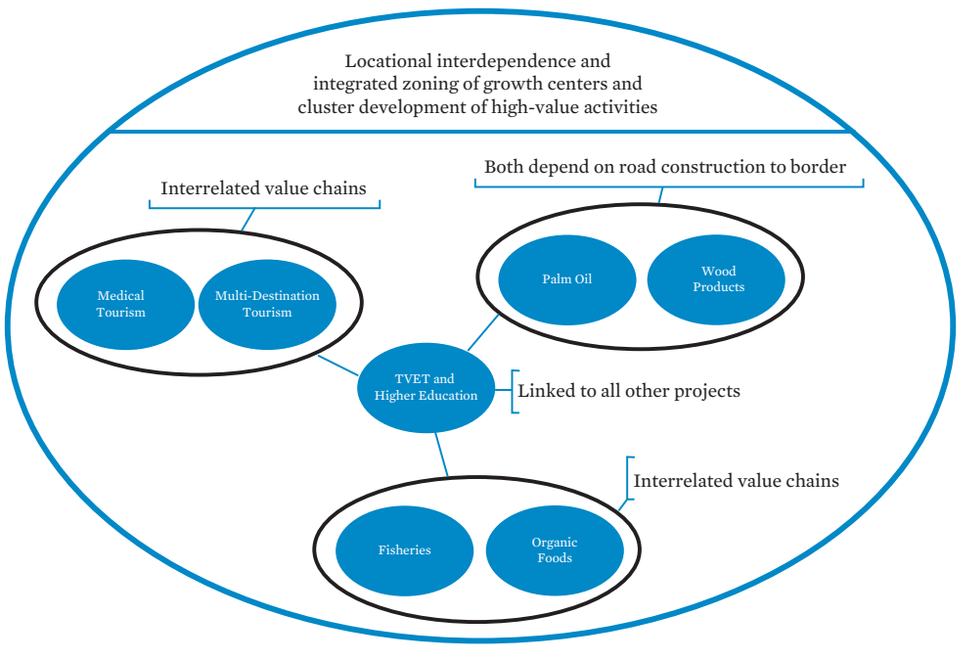
The investment program comprises (a) establishment of Sabah as a leading medical tourism center; (b) expansion of international private TVET and higher education aligned with Sabah's needs; (c) development of cross-border value chains between Sabah and North Kalimantan in palm oil, wood products, fisheries, and organic foods; (d) promotion of Sabah–North Kalimantan tourism complementarities; and (e) capacity-building support (Figure 30.1).

Figure 30.1. Investment Program



TVET = technical and vocational education and training.
Source: Elaborated by the authors.

Figure 30.2. Integrated Project Design



TVET = technical and vocational education and training.
Source: Elaborated by the authors.

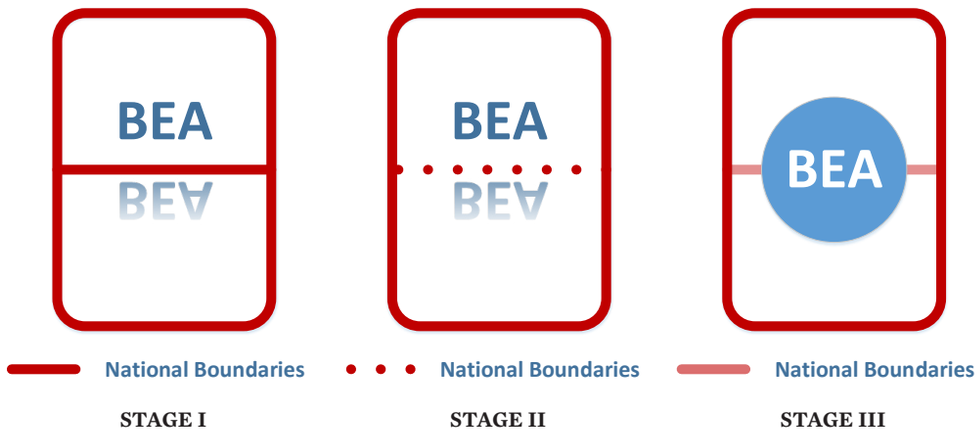
These seven projects form part of an interrelated program that in some cases have direct cross-project support (Figure 30.2). For example, medical tourism's value chain includes tourism in the post-procedure stages of treatment, and multi-destination tourism will help to attract more people to the area. In the case of palm oil and wood products, both projects depend on infrastructural investment in the construction of the road and CIQS on the Malaysian side of the border. In the case of fisheries, high value product development involves both production of premium processed products and cultivation of premium organic prawns. Finally, expanded private higher education and TVET that brings graduates in line with the needs of priority industries for the state impacts on the ability of other projects in the program to absorb needed skilled workers.

30.2 Sequencing

The approach to developing the North Kalimantan–Sabah Border Economic Area is best viewed as an incremental progression to cooperation with its neighboring countries. Formal approvals of joint projects can be complex and time consuming, so a gradual move from informal to formal mechanisms of collaboration provides an effective way forward. Figure 30.3 shows three possible stages of border cooperation, moving from independent actions on both sides, to informal cooperation, and finally to a formal mechanism.

Efforts are already underway to establish quasi-formal trading arrangements between Sabah and North Kalimantan. In April 2017, the Society Empowerment and Economic Development of Sabah signed a memorandum of understanding with KADIN (Kamar Dagang dan Industri

Figure 30.3. Stages of Border Economic Area Cross-Border Cooperation



BEA = border economic area.
Source: Based on D. Lailkaka, Q. A. Nguyen, and X. Yuan. 2011. Cross-Border Economic Zone Roadmap (TA 7356-REG: Developing Cross-Border Economic Zones between the PRC and Viet Nam). Manila: Asian Development Bank.

Indonesia), a body that represents the various trade associations in Indonesia, establishing a framework of cooperation on trade-related programs between Sabah and North Kalimantan.[153]

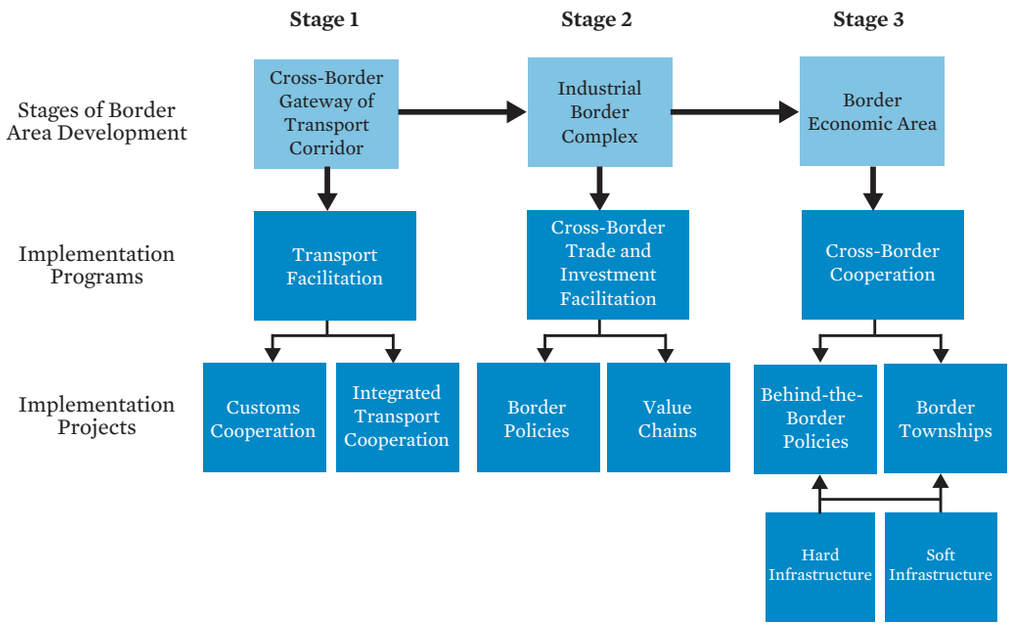
The transformation of simple border crossings into full-fledged border economic areas will require an integrated spatial planning approach that extends well beyond purely local or district policies. Moreover, development on one side of the border will, sooner or later, need collaboration with adjacent territories. Figure 30.4 shows the stages of transformation from simple border checkpoints to full-fledged border economic areas.[154]

Stage 1: Cross-Border Gateway of Transport Corridor: Existing cross-border gateways represent soft and hard infrastructural investments that aim to accommodate transport activities between neighboring countries. As such, they represent transport axes in which infrastructural measures are intended to reduce trading costs and travel time. Reduced costs and time traveled, in turn, increase the competitiveness of companies using the border crossing to deliver their products to intermediaries or end-users. At this stage, the focus is on transport facilitation through customs cooperation and integrated transport projects between Indonesia and neighboring countries.

Stage 2: Industrial Border Complex: The next level of border area development involves improvements in spatial interaction among cross-border economic activity. In Indonesia's border economic areas, these activities should focus on value chains having the following characteristics: (a) integrated infrastructure in the designated locations;

[153] *Borneo Today*. 2017. North Kalimantan Holds Great Prospects for Sabah Businessmen. 24 March. http://www.borneotoday.net/north-kalimantan-holds-great-prospects-for-sabah-businessmen/.
[154] For details, see ADB. 2014. Scoping Study for the Special Border Economic Zone (SBEZ) in the Indonesia–Malaysia–Thailand Growth Triangle (IMT-GT). Manila.

Figure 30.4. Stages of Sabah's Border Economic Area Development Program



Source: Elaborated by the authors.

(b) raw material or component supplies originating from cross-border sources; (c) provision of hard and soft infrastructure that includes transport, high-power electric supplies, high-end communications systems, large-volume water supplies, and possibly high-volume gas lines; (d) eligibility for investment incentives; and (e) localized environmental controls that are specific to the needs of the industrial areas. The focus, at this stage, should be on the development of systems to organize activities and resources involved in moving products or services from suppliers to customers by transforming natural resources, raw materials, and components into finished products, using cross-border value chains to interconnect activities between Indonesia and its neighbors.

Stage 3: Border economic areas: This stage involves the development of networks and clusters among interconnected activities that extend well beyond the industrial complex to include all aspects of spatial planning and development of hard and soft infrastructure for people living in the designated border areas. These activities cover development of (a) industrial zones, including soft and hard infrastructure and related fiscal incentives; (b) transport and logistics infrastructure to facilitate movement of goods and people across borders; and (c) development of cross-border value chains to coordinate activities between Indonesia and its neighboring countries that have a direct impact on the local economy. To that end, planners need to consider the spatial distribution and functioning of industrial zones, CIQS facilities, transport and logistics systems, governance capacity, public utilities, learning centers, townships, recreational facilities, and health-care institutions.

30.3 Implementation

The Sabah–North Kalimantan border economic area configurations depend on the weighted preferences of local and central government officials, the private sector, and the local population in each territory, as well as socioeconomic characteristics of projects. As such, a stepwise progression is suggested when designing and implementing each border area. Table 30.1 shows the recommended sequence based on best international practices.

Table 30.1. Implementation Steps

Steps	Description
1. Objective and perceptions	Determine objective preferences of stakeholder groups and undertake perception surveys of local population about the development plan.
2. Economic analysis	Assess actual and potential cross-border production activities in high-value industries.
3. Master plan	Adopt an integrated approach to the border economic area design.
4. Subprojects and border economic area components	Develop flagship projects and component implementation strategy for time-bound stages of border economic area development.
5. Pre-feasibility study	Carry out pre-feasibility study of target area with identification of benefits and preliminary costing for each subproject and the program as a whole.
6. Feasibility study	Carry out full feasibility study of target area with detailed costing and benefits for each flagship project.
7. Implementation	Program execution under well-defined management and supervision, with periodic reviews and well-defined monitoring and evaluation framework.
8. Operation	Final appraisal, independent review, and subproject and program sustainability analysis.

Source: Elaborated by the authors.