Cost-Benefit Analysis of Sandakan Airport Expansion Project in Malaysia

Zhongjian Yang [1], Binglong Gao [2]

[1.] Postgraduate School, Chinese Academy of Fiscal Sciences, Beijing, China

[2.]International Institute of Public Policy and Management, University of Malaya, Kuala Lumpur, Malaysia

Abstract. Based on facts and reasonable assumptions, this paper analyzes the expansion project of Sandakan Airport in Malaysia by means of cost-benefit analysis, including both economic and social benefits. In addition, the reasonable analysis concludes that the expansion project of Sandakan Airport in Malaysia should not be implemented if only the future economic benefits are considered. But based on the social benefits, the Sandakan Airport expansion project should be implemented, and we provide recommendations for cost-cutting and increase economic benefits.

Keywords: Sandakan Airport, Cost-Benefit Analysis, Social Economic, Economic Valuation.

1. Introduction

Sandakan Airport (IATA: SDK, ICAO: WBKS) is a domestic airport that serves Sandakan, a town in the East Malaysian state of Sabah. It is located 14 km west of downtown Sandakan. The existing airside operation facilities including aircraft runaway has a lack of capacity to handle bigger aircraft to land at Sandakan Airport. Besides, there is a demand from the airline companies to allow bigger aircraft to land at Sandakan Airport simply because to increase the frequency of domestic flights between Kuala Lumpur Sandakan and to allow international direct flight mainly from China, Japan and South Korea. Hence, there is a gap between the airport terminal building and its airside facilities.

The "Proposed Aircraft Runway Extension and Its Related Work in Sandakan Airport" is a public project that shall undertake by the Ministry of Transport Malaysia. This project is among the various national instruments to achieve the intended outcome that is "Increasing A Safe, Efficient and Rapid Passenger and Goods Movements". The national performance target is increasing 6 % of air traffic movement per annum.

Therefore, on 7th May 2017, the then Prime Minister Najib Razak announced an allocation of RM 80 million for the runway extension project in Sandakan Airport. The project was scheduled to commence beginning June 2017. However, despite having approved by the federal government in its capital budget since 2016, the Ministry of Transport is still evaluating the matter and has not yet analyzed it from the Cost-Benefit Analysis (CBA) perspective. It is, for this reason, we undertook this exercise purposely to explore the desirability of this public good.

2. Background

2.1 Sandakan Airport Facilities

The Sandakan Airport terminal building with an area of 12,000$m^2$was last upgraded in 2014. Its facilities include arriving and departing hall, check-in and luggage counters with the capacity to handle up to 1.5 million passengers annually. However, as of December 2018, the number of passengers handled was recorded only at 950,861 passengers. Meanwhile, the existing flight operation facilities consist of aircraft runaway at 2,133 meters, one connecting taxiway to terminal building, flight apron1 with capability to accommodate parking for two aircrafts Boeing 738 and Airbus 320, lighting systems comprising of the Aeronautical Ground Lightings (AGL) together with the precision approach category lighting system, and other airside facilities with ICAO standards.

In order to increase the utilization rate of airport facilities, the Sandakan Airport operator namely Malaysia Airport Holding Berhad (MAHB) has highlighted the need to upgrade the flight operation

facilities. MAHB also claimed that there is a demand from the airline companies to allow a bigger aircraft landing at Sandakan Airport so that they can provide international direct flight mainly from China, Japan and South Korea to fly directly to Sandakan.

2.2 Potential Benefits

2.2.1 Passenger Movements Trend

Airport could provide direct air traffic flows for airlines and generate taxes for governments, and provides convenience for the citizens and tourists who want to go long distance travel. Regarding Sandakan Airports, there is stable passengers and aircraft movements as recorded by the Airport Statistic 2019, MAHB. The annual passenger numbers and aircraft statistics from 2010 to 2018 are shown as the following table 1:

Table 1. Passengers and Aircraft Statistics from 2003 to 2018

Year	Passengers		Cargo		Aircraft Movements	
	Number	Rate of change (%)	Number	Rate of change (%)	Number	Rate of change (%)
2010	741 674	10.29	2 806	33.68	13 517	4.66
2011	788 515	6.31	2 300	-18.03	11 715	-13.33
2012	834 626	5.85	2 479	7.78	13 153	12.27
2013	911 855	9.25	2 894	16.74	12 856	-2.26
2014	900 016	-1.30	2 497	-13.72	12 696	-1.24
2015	853 411	-5.18	3 147	26.03	12 705	0.07
2016	863 644	1.20	3 220	2.32	12 722	0.13
2017	800 542	-7.31	2 809	-13.69	12 077	-5.07
2018	806 696	0.77	2 968	5.66	12 109	0.26

We could find in the table 1 that the passenger numbers reached a maximum level at 911,855 passengers in 2013. However, the number of passenger movements had a downturn in the next two years. The current poor facilities and infrastructure of Sandakan Airport is among the main reason for poor number of passenger movements. Although the number of passengers, cargo and Aircraft movements at Sandakan Airport increased from 2013 to 2018, the overall trend remained downward.

2.2.2 Tourism Industry Performance

Tourism is the main income industry in Sabah, and there were 3.68 million tourists visiting Sabah in 2017, of which 1.23 million are international tourists (Sabah Tourism Board, 2017). Tourism industry generated RM7.8 billion revenue for Sabah in 2017, relatively 8% increase from RM7.2 billion in 2016. As the key infrastructure of tourism, the Kota Kinabalu International Airport and Tawau Airport have achieved rapid growth for passenger movements, which is nearly 40% for the past 5 years. However, the passenger movements in Sandakan Airport is growing quite slow. It means that the tourism industry in Sandakan has not been completely famous and matured yet. The room occupancy rate of hotel industry in Sandakan is only 30%, meaning to say that there are 70% hotel rooms are vacant. Hence tourism has potential and can help increase the demand of airport services in Sandakan.

2.3 Impacts of Alternative Project

In doing CBA by following the 10 steps of its analysis sequences, we identify the alternatives and list its impacts on each alternative and the existing project. Two other alternative projects are namely option 1 is the construction of the commuter railway between Kota Kinabalu (KK) and Sandakan and option 2 is the construction of the highway between Kota Kinabalu and Sandakan.

The assigned impact is best described in table 2. Then, we assign values to these impacts. The assumption of the costs for these values are listed as table 2.

Table 2. List of alternative projects and its value assigned impact

No.	Impact	Cost	Note
Option 1	Tourists directly fly to Sandakan and stay and tourism. Direct increase on tourist numbers.	RM 80 million	-
Option 2	Tourists fly to KK first and then decide whether to come by train/car or not. Indirect increase of tourism with uncertainty.	210km About RM 14 billion	Assumption according the ECRL cost/length ratio.
Option 3		210km About RM 4.2 billion	Refer the Guthrie Corridor Expressway, RM 20 million/km.

The comparison of those options 3 shows that the cost extension airport runway project is the lowest value. More importantly, it also has the most obvious and direct impacts on local tourism and the economy.

By contrast, the other two options involve a bigger amount of investment with more uncertain results. The total population of Sandakan is only 494,900 (DOSM, 2018) the potential requirement and demand for highway and railway is low, the benefits is relatively low compared with the huge estimated amount of investment involved. So, the two options should not be taken. This report will concentrate mainly on the runway extension of Sandakan Airport and will analyze its Net Present Value (NPV) and its Benefit-Cost Ratio (BCR).

3. Research Methodology

3.1 Introduction

The presentation of this paper is guided by the 10 steps of doing CBA. It begins with clarifying the standing issues including its alternative project. In this regard, we presented several potential benefits and highlighted the gap between existing infrastructure and the potential benefits.

Then we set out the assumption of the benefit and subsequently identify the impacts of both the input (cost) and output (benefit) of each alternative project. At this level, we assigned value upon the impacts of the alternative project. In the context of this Sandakan Airport, we did not identify the unquantified value for the output produced.

In valuing the cost, we shall present the result of financial analysis which includes the NPV and the BCR. We assume passenger movements in the airport will increase at the rate of 4.03%, then we would use that figure as the basis to analyze the cash-flow of the project. We also assume the risk and uncertainty that would affect the reliability of calculated NPV. Finally, we summarize the output of this analysis with the concluding statement based on the result identified.

3.2 Assumptions on Passenger Movements

From the consultant information which based on a previous passenger trend over 10 years, the consultant decided to choose 4.03% per year on passenger growth projection. But this projection counted both arriving and departing passengers. From the number of total passengers for that particular year, 50% is estimated for departing passengers and 50% for arriving passengers. Since the Passenger Service Charge (PSC) only collected from arriving passengers, hence, other assumptions need to be clarified whereby from 50% of departing passengers, we estimate 20% is for international departure and 80% for domestic departure. All these assumptions are based on previous data from MAHB and the best estimation from MAHB.

In CBA, we need to define the quantified cost which involves staff cost, utility cost, maintenance cost and administration cost. Provided by MAHB the estimation for these costs for 2019, we use consultant escalations for each cost as per Table 3 as below:

Table 3. Escalation per year

Cost type	Staff cost	Utilities cost	Maintenance cost	Administration cost
Escalation	3%	2%	2%	2%

For the interest rate, the best estimation can be used is from consultant assumption. The consultant assumes 8% based on Return of Equity by Bursa Saham (Stock Market).

For airport tax or PSC, we use current charges by the Federal Government which are RM 11 for domestic departure and RM 73 for international departure. International departure was taken into consideration because after the runway is extended, flight from longer routes like from China, South Korea and Japan can use this runway. And for User Fee, 15% is the best assumption for this study period.

Based on Inland Revenue Board of Malaysia (LHDN), for year assessment 2019, any company with paid-up capital more than RM 2.5 million like MAHB will be charged at 24% for corporate tax and average 10% for income tax for workers at airport including MAHB staff, retail staff, restaurant staff and so on.

Based on the Greater Kota Kinabalu Overview Plan by Sabah Economic Development and Investment Authority (SEDIA), the average tourist will spend RM 1,760 per person in Sabah. All these assumptions will be used for costs-benefits calculation and analysis.

Table 4. Airport passenger flow forecast for 2020 to 2043 after airport expansion

Passenger Movements		Passenger Movements		Passenger Movements		Passenger Movements	
Years	Number	Year	Number	Year	Number	Year	Number
2020	1 029 045	2026	1 304 325	2032	1 653 246	2038	2 095 507
2021	1 070 516	2027	1 356 890	2033	1 719 872	2039	2 179 956
2022	1 113 657	2028	1 411 572	2034	1 789 183	2040	2 267 808
2023	1 158 538	2029	1 468 459	2035	1 861 287	2041	2 359 201
2024	1 205 227	2030	1 527 638	2036	1 936 297	2042	2 454 277
2025	1 253 797	2031	1 589 201	2037	2 014 330	2043	2 553 184

* As the number of years increased, the annual passenger growth rate remained at 4.03%.

According the table 4, we assumed that the maximum capacity of the airport passenger movements could reach its highest level with 2.55 million passengers by the year 2043, which would double more than the current capacity rate.

3.3 Research Method

This paper adopts the CBA method, including the calculation of BCR, Net Cash Flow, NPV and IRR, economic and social benefits are considered. The calculation formula of relevant indexes is as follows:

Net Cash Flow by using formula below:

$$Net\ Cash\ Flow = Total\ Quantified\ Benefit - Total\ Quantified\ Cost$$

Financial valuation can be presented by calculating NPV, BCR, Payback Period and Internal Rate of Return (IRR). NPV is a calculation that compares the amount invested today to the present value of the future cash receipts from the investment. The amount is discounted by a specified interest rate. The formula is as below:

$$NPV\ (i,N) = \sum_{t=0}^{N} \frac{C_t}{(1+i)^t}$$

whereas:

i = Discount rate *Ct = Net cash inflow during the period of t*
t = Period *N=Total number of periods*

BCR is used as an indicator to show the relationship between the relative costs and benefits of this project. If BCR is greater than 1.0, the project is expected to gain positive NPV. The formula for BCR is as below:

$$BCR = \frac{Benefits}{Costs}$$

Payback period also been calculated in this analysis to determine when the investment can be recovered. For simplification, the formula for the Payback period is as below:

$$Payback\ Period = \frac{Cash\ Outflow}{Net\ Cash\ Inflow}$$

And the last indicator that we use for CBA is Internal Rate of Return (IRR). IRR is the interest rate for which a project's benefits exactly balance its cos. It is the rate of project growth is expected to generate benefits.

$$NPV\ (IRR) = \sum_{t=0}^{N} \frac{C_t}{(1+IRR)^t} = 0$$

whereas*:*

t = transaction year *Ct = net cash inflow during the period of t*

NPV is equal to zero or approaches zero.

3.4 Data Collection

When collecting the primary data, we adopted qualitative research. We conduct unstructured interviews with the Ministry of Transport (MOT), Ministry of Economic Affairs previously known as Economic Planning Unit (EPU), Malaysia Airports Holdings Berhad (MAHB) officers to determine the specific cost and type of input cost of the extension runway for Sandakan Airport.

We also collect relevant secondary data about the effect of the construction of Sandakan Airport from online sources.

4. Analysis

4.1 Project Cost

Total project cost was calculated during VM lab in May 2017. The cost might be changed in future and need to be recalculate again. For the sake of this report, we use this final cost for analysis. The total project cost is RM 80 million and the detail cost is at table 5 as below:

Table 5. Total Project Cost

Items	Construction Work	Aeronautical system	Land acquisition	Consultant fees	Total
Cost	RM 55 498 976.24	RM 9 299 220.14	RM 9 500 000.00	RM 5672 049.79	RM 79970246.17

*Construction Work: site preparations and Earthworks, widening taxiway, expansion of apron and runway, fencing, drainage and other related works.

* Aeronautical system: Relocation of Glide Path, Aeronautical Ground Lightning, Floodlight, Guidance sign, flight calibration and others.

4.2 Quantified and Unquantified Benefit and Cost

Quantified benefit is calculated from the airport revenue whereby the airport revenue depends on number of passengers and airport tax (PSC). And number of passengers is taken from domestic departure and international departure. Total departure passenger (TDP) is calculated based on assumptions that we mention before. All these calculations can be illustrated in table 6 as below:

Table 6. Calculation of Quantified Benefit

Year	Domestic			International		
	TDP	PSC	TR	TDP	PSC	TR
2019	494 590	RM 11	RM 5 440 494	-	RM 73	-
2020	514 522	RM 11	RM 5 659 746	-	RM 73	-
2021	428 206	RM 11	RM 4 710 267	107 052	RM 73	RM 7 814 761
Total Quantified Benefit For 2019-202						RM 23 625 268

*TR: total revenue

In 2019 and 2020, the runway still under construction and cannot receive any international flight. Hence, no international flight and departure passenger for this period.

For unquantified benefit, the project also will be impacted by the land value increase, State planning, business opportunities, national security and environmental impact from this project.

Quantified cost is calculated based on operating expenditure that recurs every month and total cost of capital expenditure for year 2019 and 2020. As mentioned before, quantified cost is taken from staff cost, utilities cost, maintenance cost and administration cost. These costs will be escalated at 2% to 3%. All these calculations can be illustrated in table 7 as below:

Table 7. Calculation of Operating Expenditure

Cost	2019	2020	2021
Staff cost	RM 6 889 401.69	RM 7 096 083.74	RM 7 308 966.25
Utilities cost	RM 1 582 677.44	RM 1 614 330.99	RM 1 646 617.61
Maintenance cost	RM 1 711 603.40	RM 1 745 835.47	RM 1 780 752.18
Administration cost	RM 2 803 720.03	RM 2 859 794.43	RM 2 916 990.32
Total Operating Expenditure	RM 12 987 402.56	RM 13 316 044.63	RM 13 653 326.36

While for capital expenditure, we divided the total construction cost into two payments which are 50% for the year 2019 and 50% for the year 2020 as mentioned in the Assumptions chapter.

As for unquantified cost, this project may or may not be affected by political influence, environmental cost, risks as well as safety.

4.3 Net Cash Flow

After we defined and calculated quantified benefit and quantified cost. Net cash flow was calculated for the period of 2019 until 2030 and the result is as per figure 1 as below:

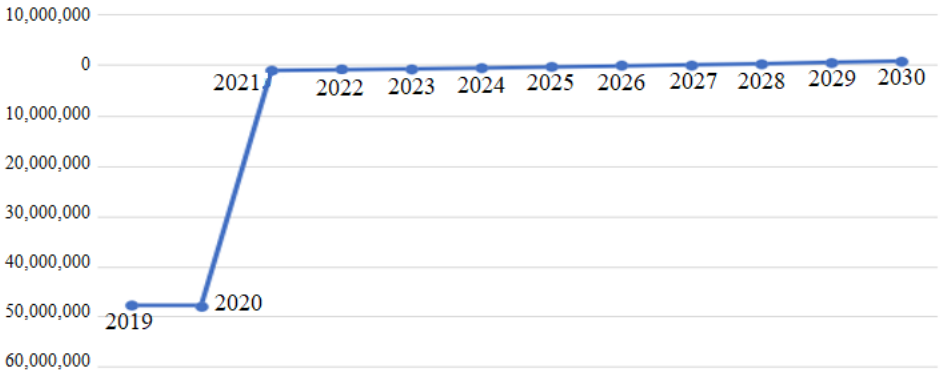

Figure 1. The Net Cash Flow of Tourist Statistic at Sandakan Airport

From the figure 1, the net cash flow is negative from 2019 until 2026. The highest negative cash flow happened at year 2019 and 2020 due to cost for capital expenditure. After 2020, the cash flow moving positively and reach positive cash flow starting from year 2027.

4.4 Financial Evaluation

We calculate the NPV, BCR, Payback Period and IRR and using data from 2019 until 2030 (12 years) to see whether the project is financially feasible or not. The result as per table 8 below:

Table 8. Financial Valuation for the period of 10 & 30years

Items	NPV	BCR	Payback Period	IRR
Results (2019-2030)	- RM 87 168 166	0.63	Incalculable	-35.64%
Results (2019-2049)	- RM 69 920 499	1.04	30.52 years	1.05%

From the above results, NPV at an 8% interest rate is negative. The benefit is still below the cost incurred in BCR. Payback Period cannot be calculated, and IRR is negative due to cumulative net Cash Flow (CF) deficits. It shows that the project is not financially feasible in a period of 12 years.

Consequently, we extend the period in order to see in what year the project will give a positive result. After extending the period, the project is financially feasible after the year 2049 (30 years). It is proved according to table 8.

The BCR is more than 1.0 shows that the benefit gained from this project is more than the cost incurred. The breakeven where the benefit equal to cost happens after 30.52 years or 30 years and 6 months. But to reach this period, the total passenger is exceeding the maximum terminal capacity (3.3 million vs 1.5 mppa). Hence, this scenario will not happen because if the terminal exceeds the capacity, other issues will raise, for example, security issues, long queue, insufficient area, congestion, passenger comfort and others. Even this period is feasible, but it is not practically feasible.

4.5 Social Economic Valuation and Social Benefit

For this study, we only focus on the number of departing tourists. Using the estimation from SEDIA about average tourists spend Sabah, the project will generate about RM 13.1 billion for a period of 12 years and RM 61.6 billion for a period of 34 years. Even this figure is not directly impacting the airport revenue, but it will increase the Gross Domestic Product (GDP) of Sandakan and Sabah.

In addition to economic benefits, we also need to consider social benefits. Air transportation promotes sustainable development. Air transport has made great contributions to sustainable development by supporting and promoting international tourism. Tourism creates economic growth, provides jobs, increases taxes, promotes the development and conservation of protected areas, as well as the environment. In fact, environmental protection attracts the development of tourism and

tourism. Provide funding for the protection of natural and cultural heritage, thereby increasing the benefits of protected areas to the country. In addition, promotion A natural-based tourism is an effective lobbying tool that is conducive to natural protection rather than unsustainable agricultural activities.

4.6 Government Revenue Valuation

Based on assumptions for corporate rate and income tax rate, user fee and land fee, the government revenue that will gain from this project are tabulated as per table 9 as below:

Table 9. Government Revenue in 12 years & 34 years period

Items	Unit	User Fee (15%)	Land Fee (3 land lot)	Corporate Tax (24%)	Income Tax (10%)	Total
12 Years	Million RM	24.25	0.36	32.9	9.7	67.21
34 Years		120.11	1.02	163.1	39.78	324.01

Either 12 years or 34 years, both periods generate government revenue because it depends on number of passengers, staff working at airport and revenue from airport.

4.7 Economic Valuation

In this section, we undertook economic valuation with the assumption that airport services produce an indirect bad effect called a negative externality. Assuming the increasing utilization rate of airport facilities increases aircraft movements, this situation indirectly may cause noise pollution to the surrounding neighborhood. This negativity influences the existing market of airport services.

4.7.1 Valuing Cost (Negative Externalities)

The negative externality is described in the following figure 2:

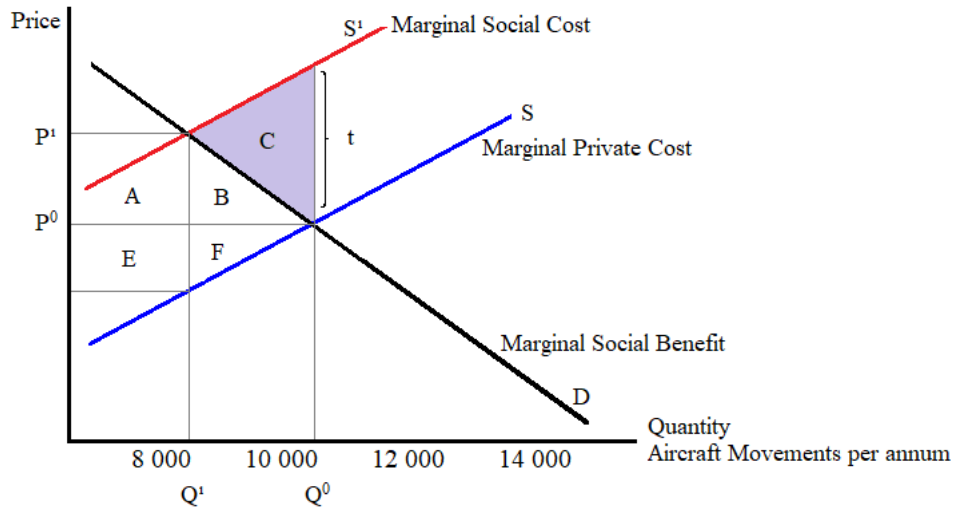

Figure 2. Production produces marginal social cost

The vertical line in the figure above labeled as “Price” refers to the charges imposed by the supplier which is, in the context is MAHB. As an airport operator, MAHB generates its revenue from airport services. Meanwhile, the horizontal line represents the quantity of the consumption by an airline company which is measured by aircraft movements per annum.

In 2018, the total number of aircraft movements in Sandakan Airport was 10,571 comprising both scheduled and non-schedule domestic and international flights.

The original equilibrium point between supply curve and demand curve represents by Q^0 and the equilibrium price P^0. The supply curve S refers to airport services provided by MAHB to consumers

while the demand curve labeled D refers to the quantity of demand from consumers which are airport users.

The market price at P^0 is too low ($P^0 < P^1$) because it fails to take into consideration to cost of indirect effect it imposes to the third party. Assuming airport services carry additional cost, such installing noise barrier and hearing treatment, every additional consumption above Q^0 produced marginal social cost above marginal social benefit. Therefore, it causes deadweight loss (area C).

This scenario of market failure needs government intervention. The effective government instrument is tax regulation. As the airport operation now have additional tax from government, the supply curve moves from S to S^1. At the same time, the original price escalates from P^0 to P^1. Subsequently the consumption shift from Q^0 to Q^1.

Several concluding points from the above figure are:

Consumer (Airport user) pay higher price for less goods (less aircraft movement), they loss consumer surplus equal to area A + B.

Supplier (Airport operator) sell less goods (less aircraft movement) at increased costs, they loss producer surplus equal to area E + F.

The neighboring households receive benefits equal to area B + C + F because reduction aircraft movement causes less noise pollution.

Government receives tax revenue equal to area A + E.

Areas A + B + E + F represent transfer from airport operator to airport user.

Area C can be counted as gain to society because of tax policy.

4.7.2 Valuing Net Benefit (Negative Externalities)

In identifying net benefit resulted from negative externality, the following points highlight the area of benefit and loss from the figure 2 above:

Gain to third party (Neighboring households surrounding airport) is the area B + C + F.

Government revenue equals to area A + E.

Loss in consumers surplus (airport user) is the area A + B.

Loss in supplier surplus (airport operator) is the area E + F.

Therefore, net benefit is produced when benefit subtracted by loss which is represent by the area of C.

4.8 Risk and Uncertainty

4.8.1 Risk

Identifying risk and uncertainty during the lifespan of undertaking projects could help increase the reliability of the identified NPV. In CBA, the risk is defined as randomness which is measurable and can be described by a probability distribution while uncertainty is randomness without a well-defined distribution.

While assessing the proposed upgrading Sandakan Airport, the social and demographic factors were identified as a potential element that could minimally affect the estimated NPV of that project.

From secondary data, we identified 3 incidents that have affected the Sandakan social-economy for the past 5 years. Among the 3 cases, the tourist kidnapping case poses a potential effect on the number of tourist arrivals in east coast of Sabah including Sandakan. Co-incidentally, the number of passenger movements in Sandakan Airport reduce between 1.3 % in 2014 and 5.2% in 2015. Hence there is a potential correlation between the kidnapping case and the airport utilization rate. At the same time, the issue of electricity supply is being addressed by the federal government with improving facilities at the existing power grid substation. Similarly, the issue of the faulty crane in Karamunting Jetty of Sandakan is being addressed by its Sandakan municipal council.

After all, as tourism is the potential benefit of airport projects, the risk of kidnapping incidents should be emphasized by The Ministry of Transport. Therefore, the government should continue empowered ESSCOM so that the security is east Sabah is under control.

4.8.2 Uncertainty

Regarding uncertainty, 2 environmental pollution cases were identified namely the Segaliud river pollution incident caused by palm oil waste in the area of Batu Sapi in Sandakan and another is Garbage discharge on ocean water such as Kampung Berhala, Sandakan. After the media expose the issue, an appropriate action was taken by Department of Environment together with local authority.

These two cases may affect the supply of seafood to restaurants and subsequently affected tourism industry.

Another issue is the police authority had announced that Tawau and Sandakan, Sabah were used by terrorist group of Daesh as transit points form them to depart to southern Philippines and Rakhine in Myanmar (BERNAMA, April 2019). This issue is ambiguous to public and difficult to measure because of it is a classified information by Royal Malaysia Police.

Above all, the direct effect of these occurrences is difficult to quantify and therefore, we will only acknowledge it.

5. Discussion on Finding

Conducting a thorough CBA of airport investment projects can be useful to determine the return to government after investment be made. From the analysis conducted, we conclude that the Sandakan Airport runway extension project is not feasible where all CBA indicators show negative results. Therefore, the best option is to reject the proposal for this project for this year. But it may be considered if the State and Local Authority are aggressively promoting Sandakan tourism which may increase the number of passengers in Sandakan Airport for the next few years.

It can be seen from the calculations in the analysis section that, in order to obtain positive results for the BCR 1.013, IRR 0.01% and payback period 10.9 years, the project is feasible when passenger traffic growth exceeds 11.6%. On the other hand, the federal government needs to increase the PSC to generate higher revenue in the short term.

6. Conclusion and Policy Recommendation

Nonetheless, it should be noted, even the CBA analysis give positive results, the evaluation is subject to significant risk and uncertainties. The risk and uncertainty also should be considered in order to get the desired growth percentage.

In any airport projects, the cost is always higher than the benefit. It will reflect to the NPV, BCR and Payback Period. As a public goods, the return on investment is not a main focus because it can increase socio-economic growth and give more income to Government indirectly thru Corporate Tax and Income Tax.

Whether the project is feasible or not, it depends on airport revenue which calculated based on total passengers. If the growth is rapidly, then the investment has higher return and more cost efficient. From analysis, the revenue is the key of the project feasibility. The airport revenue can be obtained from the increase in total passenger or PSC.

In addition, in order to reduce risks and uncertainties and facilitate the future implementation of the project, we suggest in order to ensure the project is feasible. The recommendations are as below:

All related parties such as Local Authority as well as State Authority should work together in order to provide the best attraction for tourists, boost the economy activities e.g. create Sandakan as a Educational Hub and create job opportunity and promoting cheaper seafood and others.

Federal Government and Airlines could help to improve connectivity between cities.

Federal Government to revise the PSC rate to cover the increasing operation cost every year.

Related agencies to strengthen the security to reduce the kidnapping cases, threat from terrorist and others.

To reduce all risk and create a new opportunity for uncertainty.

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