

# **PAYMENT FOR ECOSYSTEM SERVICES: WILLINGNESS TO PAY FOR FOREST RECREATION SERVICES AT MOUNT SILAM, SAPAGAYA FOREST RESERVE LAHAD DATU SABAH**

**Siti Masturah Norbeh<sup>1</sup>, Jurimin Ebin<sup>1</sup>, Daim Balingi<sup>1</sup>,  
Hamidah Bujing<sup>1</sup> & Yong Szu Cherng<sup>1</sup>**

*<sup>1</sup>Sabah Forestry Department (MALAYSIA)*

*E-mails: sitimasturah.norbeh@sabah.gov.my, janius.ebin@sabah.gov.my,  
daim.balingi@sabah.gov.my, hamidah.bujing@sabah.gov.my,  
szucherng.yong@sabah.gov.my*

## **Abstract**

Mount Silam, one of the tourist destinations in Lahad Datu, is nestled within the Sapagaya Class I Forest Reserve and located about 10km from the Lahad Datu town. Revenues from forest recreational activities within this forest reserve were collected in the form of entrance fee and other charges. Managing the forest recreation services is challenging and costly, therefore, the Department has exploring Payment for Ecosystem Services (PES) as one of the potential financing mechanisms for a sustainable ecotourism management. As part of the initiative, a field questionnaire interviews were conducted with the aim of ascertaining Willingness to Pay (WTP) for forest recreation services at Mt.Silam. The questionnaire was administered to 385 respondents, and the data collected were subjected to statistical analysis. Based on the Contingent Valuation Method (CVM), the average incremental WTP value was RM2.00 over existing facilities and the average WTP value over new facilities was RM 6.00. The WTP estimate provides an indicator of the revision upon the entrance fee that the Department could charge per entry in future. Regression analysis revealed that the level of visitors' satisfaction on natural environmental attractions has significant influence on their willingness to pay. Although new proposed facilities do not significantly influence the visitors' willingness to pay, but the relation has confident level at 85%, which signify that visitor view positively on moves to add new facilities to Mt. Silam. In this study, socio economic status does not affect the willingness to pay of visitors. The study also revealed the direct contribution to the local economy of Sabah from recreational activities at Mt. Silam could reach up to RM2.07 million per year. In aggregate over a year period and 23,000 visits to Mt. Silam, the direct and indirect economic impacts, and the direct, indirect and induced impacts to the Sabah economy were estimated to be RM3.84 million and RM5.23 million per year respectively. The study benefits Sabah Forestry Department on the management of natural resources and improving forest recreation services inside forest reserves.

Keywords: Willingness to pay, forest recreation, Contingent Valuation Method

## 1.0 Introduction

Sabah has a total land mass of about 7.34 million ha whereby about 65.4% or 4.8 million ha of the land mass is still covered with forests. Out of this, about 3.8 million ha or 79.2% are regulated forests consisting of forest reserves, parks and wildlife sanctuaries. Forest reserves accounted for 3.5 million ha or 73.8% of the forests cover. Forestry has traditionally been the main stay of the state's economy and has been for a long time the major backbone of the state's socio-economic well-being. To ensure that the forestry sector continue to contribute sustainably to the economic development, the State Government has initiated various programs and projects to explore new sources of income, based on the multiple-use forest management concept. These include enhancing forest rehabilitation for future timber production, giving priority to forest conservation for strengthening nature-based tourism, strengthening partnerships by engaging with potential investors in carbon trading, developing mechanisms and an institutional framework for Payment for Ecosystem Services, and exploring alternative revenue sources from Non-timber Forest Produce (NTFP).

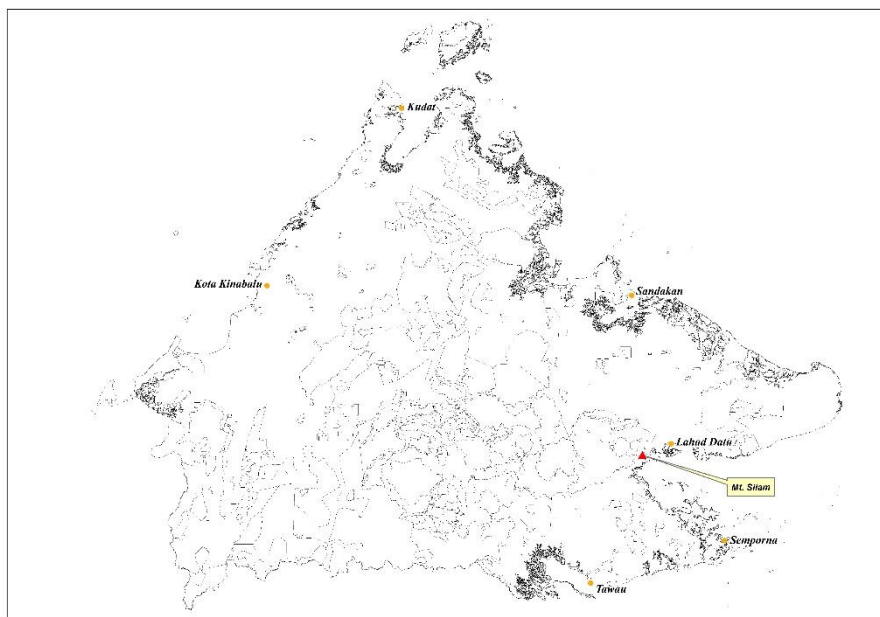
As part of the strategy to optimize revenue generation from forest recreation activities and nature-based tourism, the Sabah Forestry Department has developed about 37 nature-based recreation sites within forest reserves throughout the State. Revenue from these activities is collected in the form of entrance fee and other charges such as vehicle fee, rental fees for facilities and occupation permits. Because of the ongoing urbanization, the demand for outdoor recreation has increased significantly over the years as the tranquil and scenic environment of the forests provide escapism from modern life, and people are more aware of the health benefits associated with an active lifestyle. Managing the recreational sites to meet the increasing demand is challenging and costly. Therefore, the Department has been exploring Payment for Ecosystem Services (PES) as one of the potential financing mechanisms for a sustainable ecotourism management. PES is an innovative mechanism for ensuring and enhancing the provision of ecosystem goods and services through the transfer of financial resources. The basic concept of PES is that those who benefit from ecosystem services should pay damages or rewards to those who provide a service (Wunder 2005). One of the main features of PES is a voluntary transaction (Wunder 2005).

In 2017, the Sabah Forestry Department had successfully secured a grant amounting RM200,000 from the National Conservation Trust Fund for project Development of Payment for Ecosystem Services at Mount Silam, Sapagaya Forest Reserve, Lahad Datu, Sabah. The project aims to develop workable PES mechanism on forest recreation services in Mt. Silam, which can be replicated and implemented throughout the forest reserves in Sabah. The project consists of four components, which are capacity building, estimate economic value of forest recreation services in Sapagaya Forest Reserve, multi-level collaboration on formulation of the PES mechanism, and documentation & reporting.

As part of the process in developing the PES mechanism, a willingness to pay (WTP) study was conducted to ascertain the WTP for forest recreation services at Mt. Silam and to quantify the economic value of forest recreation services of Mt. Silam. This paper focuses on the WTP for forest recreation services at Mt. Silam. As argued by many studies, the WTP is widely used in economic studies since this approach expresses an individual's valuation of a given resource. WTP is a measure of the economic sacrifice which an individual is willing and able to forego in terms of income or other good or service to get more of another good and service (Klemperrer, 1996). In addition, the study examined socioeconomic characteristics, such as gender, education, and household incomes that could influence the WTP for forest recreation. The WTP estimate provides an indicator of the revision upon the entrance fee that the Department could charge per entry in future. The current entrance fees are RM5 and RM3 for Malaysian Adults and children while for international visitors, the entrance fees are RM15 for adult and RM7 for children. Findings, discussions, and conclusions of this study are paramount for both policy decision making and designing, as well as implementation of further research studies as regards forest ecosystem services in global changing economies.

## 2.0 Background Of Mount Silam, Sapagaya Forest Reserve

Mt Silam is located about 10km from Lahad Datu town, nestled within the Sapagaya Forest Reserve (Class I & Class IV) of 7,341 ha (Figure 1.0). It is an ultramafic mountain situated at the coastal area overlooking the picturesque Darvel Bay, rising from sea level to 884 m a.s.l, making it the highest point in the Lahad Datu district. The forests of Mt Silam display unique formation from lowland evergreen rain forest at the lower altitude to the stunted forest at the higher altitude. The vegetation at the summit bears a striking resemblance to Mount Kinabalu's montane cloud forests at 2,100 – 3,000m a.s.l. Mt Silam has been opened to the public in 2011, and since then it has been one of the popular tourist destinations in Lahad Datu. Recreational facilities provided at the site includes restaurant, camping ground, jungle trail, guest house and an observation tower. The observation tower which is also known as Tower of Heaven (Menara Kayangan) rises at 30m high built at elevation of 620m from sea level. This gives visitors a tranquility scenic bird's eye view of the beautiful Darvel Bay Islands and Lahad Datu Town. The observation tower also offers the plant and animal enthusiasts good views of the variety types of forest and birds of Mt. Silam. A viewing platform in front of the tower had been developed for visitors to enjoy the spectacular view of Darvel Bay and its islands. The current entrance fees are RM5 and RM3 for Malaysian Adults and children while for international visitors, the entrance fees are RM15 for adult and RM7 for children. Every year since 2013, total visitors visited Mt. Silam is about 23,000 visitors.



**Figure 1.0** Location of Mt. Silam

## 3.0 Methodology

The study was conducted in August 2019. Prior to the commencement of the study, a technical working group was established consisting of key officers of Sabah Forestry Department headquarters and the Forestry Department of Lahad Datu District. The preparation of questionnaire began in May 2019 with a meeting and discussion on the work plan between the technical working group. The drafting and designing of questionnaire were conducted under the coaching of Prof. Dr. Mohd Shahwahid Haji Othman, the then lecturer at Universiti Putra Malaysia, through several workshops. Once the questionnaire finalized, it was tested to 50 respondents for preliminary assessment. The preliminary

assessment is necessary for early detection of errors in soliciting needed information and data from the visitors during the conduct of the personal interview. There upon improvements of the questionnaire design were made to most importantly ensure that the exercise will be able to meet the objective of the project. A total of 358 respondents were interviewed during the five months of the study (August to December 2019).

The questionnaire was structured into three sections and scripts with 38 questions, with open ended and guided questions. Section A comprised of a series of questions intended to gather information on the demographic profile of respondents while section B was designed to capture information on visitation characteristics including costs and expenses involved in the visit. Section C aims to obtain the visitor's willingness to pay for extra charge in addition to the current entrance fee over the existing condition and facilities in Mt. Silam, and also over proposed new facilities. This section was also dedicated to measure their level of satisfaction on the recreational facilities and natural attraction, including their perception towards improving the recreational facilities and maintaining Mt. Silam as protection forest.

## **4.0 Results**

### **4.1 Socio Demographic Background**

The majority of respondents are local Sabahans (87.3%) followed by domestic tourists i.e. from Peninsular Malaysia and Sarawak (11.9%) and the rest are international tourists (0.8%). This implies that Mt. Silam is already well known among residents of Sabah. The number of male respondents is more than females with a breakdown of 237 (61.6%) and 148 (38.4%) respectively. Given that the respondents were randomly selected, the distribution may be related to the activities undertaken at Mt. Silam that may involve physical exercises. In terms of marital status, there were more single respondents, about 206 people (53.5%) compared to those who were married that is 179 people (46.5%). Most of the respondents are within the age group ranging from 21 to 30 which is 171 people (44.4%) and aged 31 – 40 years old is 124 people (32.2%).

The majority of the respondents interviewed are those who graduated with pre-university/diploma and secondary school education involving 34.0% and 33.8% respectively. Other levels of education include primary school (2.3%) and tertiary education (27%). A small number of respondents have no formal education with 2.9%. In terms of occupations, those who are working in the private sector represented 36.1% (139 people) of the total respondents followed by those in the public sector with 124 people (32.2%) and self-employed accounting for 22.1%. Unemployed and pensioners comprised 8.6% and 1.1% respectively. In terms of income, a high number of respondents have monthly incomes within the range of RM1,001 – RM2,000 (28.6%) followed by 19.7% within the range of RM2,001 – RM3,000. Slightly smaller proportions have monthly incomes RM1,000 and below (16.1%) and in the range of RM3001 to RM4,000 (13.2%). Those respondents having monthly income categories greater than RM4,000 have smaller representations. But it is interesting to note, there are respondents earning high monthly incomes visiting Mt. Silam.

The above spread of gender, age, education, occupation and incomes suggest that Mt. Silam has attracted a broad range of attention and interests among the public and visitors. This also indicates that Mt. Silam has great potentials as an eco and nature tourism attraction.

## **4.2 Characteristic of Visitation**

In terms of visiting accompaniment, more than half of the respondents (53.8%) visited Mt. Silam with social friends and 30.1% were with families. While smaller proportions came alone (7.3%) and with colleagues including education and work-related (8.6%). The rests were arranged by tour agents as part of the visit package. The accompaniment profile could be linked with the purposes of visit.

The survey found that the purposes of visit were mainly for personal and leisure visit (54%) and recreational and physical exercising excursions such as jogging, hiking or cycling (39%). Some 6% of the visits were part of the co-curriculum activities of students from learning institution with 1% coming for work-related task such as scientific research and observation. This relationship between accompaniment and purposes of visit further strengthens the understanding of who and with whom, and nature of visit trips to Mt. Silam. Accompaniment with friends and families is relatively more related to personal and leisure visits. Accompaniment with colleagues, coming alone, and also with friends may also be linked to visiting for the purpose of recreational and physical exercising excursions. While accompaniment with colleagues may be linked to co-curriculum activities of students and work-related.

The majority of transportation mode used for the travel to Mt. Silam was by car involving 85.5% followed by walking or cycling (13.3%). This is understandable given the location of Mt. Silam is quite a distance from Lahad Datu. Hence, there were very low proportions travelling with tour buses and driving motorcycles. The low proportion of respondents travelling on tour buses is quite surprising given the rich biodiversity at the recreational site and enjoyment of a beautiful scenery provided by Mt. Silam. It is possible that international tourists particularly from China are more attracted to island tourism.

Most respondents visited Mt. Silam more than once which comprised 65.2% while the rests were first timers. This information is significant in that almost two out of three arrivals are returning visits. This indicates that a visit to Mt. Silam is memorable and beneficial that are encouraging returning visits. This has very positive implications in terms of investments on facilities and attractions, as there will be assurance of continuity and sustainability of interests among visitors.

## **4.3 Willingness to Pay (WTP) for Existing and Improved Ecosystem Services and Facilities at Mount Silam**

In this study, the visitors' WTP is measured over two scenarios; one upon the existing endowed ecosystem services and facilities at Mt. Silam and the other upon the hypothetical improvements of existing facilities and the additions of proposed facilities. The payment vehicle used to obtain the WTP value expressions is by asking the additional willingness to contribute a higher entrance fee to visitors on top of the current fee. Visitors are inquired if under a scenario of existing ecosystem services and facilities are they willing to pay more. Then another scenario of potentially providing improvements of existing facilities and the introduction of new facilities, with existing ecosystem services maintained, would they be willing to pay a higher entrance fee.

### **4.3.1 WTP Over Existing Facilities**

About 45% respondents suggested that the existing entrance fees should be maintained. Meanwhile, 20% were willing to pay an additional RM5.00 to the current rate imposed to both locals and foreign visitors and about 15% were willing to pay an additional amount of RM1.00. The average incremental WTP value was RM2.00. The overall level of WTP contribution over existing facilities is shown in Table 4.1

**Table 4.1** Additional WTP to Entrance Fee Over Existing Facilities

<b>Level of Additional WTP Contribution (RM)</b>	<b>Percent (%)</b>
0.00	45
1.00	15
2.00	8
3.00	7
4.00	2
5.00	20
Did not answer	3
<b>Total</b>	<b>100</b>

### 4.3.2 WTP Over New Facilities

Most of the respondents (95%) were willing to pay a higher entrance fee in addition to the existing entrance fees with new proposed facilities. Table 4.2 shows the additional WTP distributions among the respondents surveyed. About 30% of the respondents were willing to pay an additional of RM 5.00 – RM 6.00 with another 24% willing to contribute an additional of RM 3.00 – RM 4.00 and 18% an additional RM9-10 per entry. Meanwhile about 4% were not willing to contribute any additional amount to the existing entrance fee. The average WTP value over new facilities was RM6.00.

**Table 4.2** Additional WTP to Over New Proposed Facilities.

<b>Level of WTP Contribution (RM)</b>	<b>Percent (%)</b>
0.00	4
1.00 – 2.00	10
3.00 – 4.00	24
5.00 – 6.00	30
7.00 – 8.00	8
9.00 – 10.00	18
11.00 – 12.00	2
Did not answer	4
<b>Total</b>	<b>100</b>

### 4.4 Result of Regression Analysis

Regression analysis were conducted to identify significant factors influencing the WTP values placed by visitors. The results of the regression analysis show that existing natural environmental attractions and facilities at Mt. Silam were statistically significant factors affecting WTP, while other factors such as visitors' socio-economic background were not significantly affecting the WTP. This indicates the importance to maintain and preserved the natural environment of Mt. Silam.

#### 4.4.1 Additional WTP for Mt. Silam over Existing Natural and Environmental Attractions

Visitors are asked to rate several natural and environmental attractions at Mt. Silam using a scale of 1 (Very Dissatisfied), 2 (Dissatisfied), 3 (Satisfied) and 4 (Very Satisfied). Visitors view positively on the presence of natural and environmental attractions at Mt. Silam as shown in Table 4.3 below.

**Table 4.3** Average ratings of existing natural environmental forest attractions at Mt. Silam

Existing Natural Environmental Attractions	Average Rating*
Forest environment	3.59
Windy conditions	3.61
Cool weather conditions	3.60
Viewing of Darvel Bay and its islands	3.47
Small orangey-red crab	2.41
Mt Silam summit	2.48
<b>Overall</b>	<b>3.57</b>

Rating scale: 1 - Very Dissatisfied; 2 – Dissatisfied; 3 – Satisfied; 4 - Very Satisfied

The ratings provided for the natural and environmental attractions were used to compute an average rating value. The computed average rating of these natural and environmental attractions that was obtained was 3.57 which implies a rating closer to “Very Satisfied”. A function on Additional WTP for the visit to Menara Kayangan at Mt. Silam’ over the presence of existing natural and environmental attractions was estimated. The function obtained is shown in equation (1) with more details provided in Table 4.4 below. The coefficient for the rating on natural and environmental attractions was significant at the 5% level. This estimated coefficient implies that for every 1-unit scale increase in the level of satisfaction of existing natural and environmental attractions, there will be an increase in Additional WTP for Mt. Silam by RM0.74.

$$\text{Additonal WTP} = -0.743 + 0.743 \text{ Rating}_{\text{Natural \& Environmental Attractions}} \quad (1)$$

(-0.67) (2.41) \*

Figures in bracket are the t statistic. \* indicates significant at 5% level

**Table 4.4** Regression function of Additional WTP for Mt. Silam with existing forest natural & environmental attractions

Variable	Coefficient	t-Statistic	P-value
Intercept	-0.74272	-0.667	0.505
Rating of Natural & Environmental Attractions	0.74304	2.414	0.016

Rating scale: Very Dissatisfied – 1; Dissatisfied – 2; Satisfied – 3; and Very Satisfied - 4

#### 4.4.2 Additional WTP for Mt. Silam over Existing Facilities

Visitors are asked to rate the existing facilities available at Mt. Silam using a scale of 1 (Very Dissatisfied), 2 (Dissatisfied), 3 (Satisfied) and 4 (Very Satisfied). The range of responses varied on the available facilities at Mt. Silam as shown in Table 4.5 below.

**Table 4.5** Average ratings of existing facilities at Mt. Silam

Existing Facilities	Average Rating*
Ticket Counter	3.17
"Menara Kayangan" Tower	3.09
Rest Area (viewing platform and resting hut)	3.13
Toilet	2.58
Landscape	3.01
Restaurant	2.55
Car Parking Area	2.82
Road System	2.65
Forest Tracks	2.11
Camp Sites	1.42
Rest Houses	1.28
Overall Rating of Existing Facilities	3.01

\*Rating scale: 1 - Very Dissatisfied; 2 – Dissatisfied; 3 – Satisfied; 4 - Very Satisfied

The ratings provided for the various existing facilities were used to compute an average rating value. The computed average rating of these existing facilities that was obtained was 3.01 which implies a rating closer to being “Satisfied”. A function on Additional WTP for Mt. Silam over the presence of existing facilities was estimated. The function obtained is shown in equation (2) with more details provided in Table 4.6 below. The coefficient for the rating on existing facilities was significant at the 5% level. This estimated coefficient implies that for every 1-unit scale increase in the level of satisfaction of existing facilities at Mt Silam, there will be an increase in the Additional WTP to visit Mt. Silam by RM1.65.

$$\text{Additional WTP} = -3.071 + 1.654 \text{ Rating}_{\text{Existing Facilities}} \quad (2)$$

(-2.64)\* (4.33)\*

Figures in bracket is the t statistic. \* indicates significant at 5% level

**Table 4.6** Regression function of Additional WTP for Mt. Silam with presence of Existing Facilities

Variable	Coefficient	t-Statistic	P-value
Intercept	-3.07066	-2.64182	0.008584
Rating Fac Existing	1.65444	4.33399	0.00002

Rating scale of 1 (Very Dissatisfied) 2 (Dissatisfied) 3 (Satisfied) and 4 (Very Satisfied)



#### 4.4.1 Additional WTP for Mt. Silam with Proposed New Facilities

Visitors view positively on moves to add new facilities to Mt. Silam as shown in Table 4.7 below. Visitors are asked to rate several potential new facilities being planned for Mt. Silam using a scale of 1 (Not Needed), 2 (Needed) and 3 (Much Needed).

**Table 4.7** Average ratings of proposed new facilities to Mt. Silam

Proposed New Facilities	Average Rating*
Iconic features	2.86
Telescope	2.90
Flying fox and luge	2.82
Cafe	2.82
Strawberry garden	2.74
Orchid garden	2.77
Small orangey-red crab garden	2.78
Interactive device	2.81
Steamboat	2.71
Night walk	2.73
Cultural performance	2.60
<b>Overall</b>	<b>2.78</b>
* Scale of 1 (Not Needed), 2 (Needed) and 3 (Much Needed).	

The ratings provided for the various proposed new facilities were used to compute an average rating value. The computed average rating of these proposed facilities was 2.78 which implies a rating closer to “Much Needed”. A function on Additional WTP for Mt. Silam when several proposed new facilities are set up was estimated. The function obtained is shown in equation (3) with more details provided in Table 4.8 below. Even though the coefficient for the rating on proposed facilities was not significant at the 5% level, but the relation has a confidence level of up to 85%. The estimated coefficient for Rating<sub>Proposed Facilities</sub> implies that for every 1 unit increase in perceived scale of the proposed facilities, there will be an increase in Additional WTP for Mt. Silam by RM0.91.

$$\text{Additional WTP} = 3.545 + 0.911 \text{ Rating}_{\text{Proposed Facilities}} \quad (3)$$

(1.99)\* (1.43)

Figures in bracket is the t statistic. \* indicates significant at 5% level

**Table 4.8** Regression function of Additional WTP for Mt. Silam with Proposed New Facilities

Variable	Coefficient	t-Statistic	P-value
Intercept	3.54547533	1.994829	0.04677
RatingcadanganFaci	0.91129765	1.434127	0.152352

Rating scale of 1 (Not Needed) 2 (Needed) and 3 (Much Needed)

## 4.5 Visitors' Assessment on the Functions of the Recreational Area of Mt. Silam

Visitors' views were assessed on the importance of the ecosystem functions of Mt Silam by using a scale of 1 (Not Needed), 2 (Needed) and 3 (Much Needed). Visitors' assessment rate on the functions of the recreational area of Mt. Silam were shown in Table 4.9 These figures were used to compute an average level of assessment. The average level of assessment obtained is 1.91, suggesting that recreational area functions of Mt. Silam was closer to "very important".

**Table 4.9** Visitors' Assessment on the Functions of the Recreational Area of Mt Silam

Recreational Function	Assessment Level
Tourist Destination / Recreational Area	1.93
Soil Protection	1.93
Watershed	1.92
Environmental Education	1.91
Local Climate Regulation	1.92
Wildlife Habitat	1.92
Biodiversity	1.92
Economic Opportunity	1.85
<b>Overall Rating to conserve and retain Mt Silam Recreational area</b>	<b>1.91</b>

\*Scale Assessment: 0 - (Not important); 1 - (Medium importance); 2 - (Very important)

## 4.6 Local Economic Impacts

Various types of expenditure were incurred for a trip to M.t Silam. This includes (i) during preparation to make the trip, (ii) during the travel to Mt Silam, and (iii) while at Mt. Silam. Each visitor incurs different amount of expenditures ranging from as low as RM5 per trip to as high as RM1,400 per trip. The earlier refers to a visitor living close to Mt. Silam who walk to the site and upon entrance has to incur an entrance fee of RM5.00 per entry. The latter may refer to an international visitor who may incur various expenditure that may include on flight ticket, land transport possibly car rental, petrol, insurance, food at the restaurants and convenient stores, lodging, entrance fee and many others. On average, it was estimated that the expenditure being incurred by visitors was estimated as RM90.20 per trip (Table 4.10).

A breakdown of the visiting expenditure suggests that the average expenditure during preparation for the trip would take up RM29.95 involving 33.6% of the average total expenditure. A bigger component is on food taking up 24.0% of total expenditure or 71.4% of the sub-total during preparation stage. A small component belongs to others in particular lodging. Low average lodging cost is due to the fact only a small number of visitors are international tourists (<1%) and domestic non-Sabahan tourists (12%). The Covid19 pandemic and restrictions on international tourists could explain for the low number of foreign visitors. The rests are local Sabahans especially from Lahad Datu and surrounding Mt. Silam localities who did not incur lodging expenditures. Even the tourists who were incurring lodging expenditures would have to apportion that costs with visits to other tourist destinations during their stay at Lahad Datu. A tourist has multiple destinations in a day.

The average expenditure during travel to Mt. Silam took up RM45.97 per trip that covered 50.5% of the average total expenditure. The major components are on vehicle petrol, transportation (car rental or those paying taxi fare) and on food taking up 30%, 10.3% and 9.6% respectively of total expenditures or 58.2%, 20.1% and 18.6% respectively in terms of the sub-total expenditures. The average expenditure at Mt. Silam took up RM14.28 per trip only that covered 15.8% of the average total expenditure. The major components are on the entrance fees, food and accommodation at site

that took up 11.7%, 3.6% and 0.5% respectively of total expenditures or 74.0%, 22.7% and 3.3% respectively in terms of the sub-total expenditures.

**Table 4.10** Average contribution to the local economy from visiting Mt. Silam per trip

<b>Expenditure</b>	<b>RM/trip</b>	<b>Percent (%)</b>
<b>During Preparation:</b>		
Food	21.42	24.0
Recreational gear	6.58	7.4
Others	1.95	2.2
Sub-total	<b>29.95</b>	<b>33.6</b>
<b>During Travel to Mt. Silam:</b>		
Food	8.54	9.6
Transportation	9.24	10.3
Vehicle Petrol	26.77	30.0
Rental of services	0.96	1.1
Parking	0.04	0.0
Others	0.42	0.5
Sub-total	<b>45.97</b>	<b>50.5</b>
<b>At Mt. Silam:</b>		
Food	3.24	3.6
Entrance fees	10.57*	11.8
Accommodation (rest house / camp site)	0.47	0.5
Others	-	-
Sub-total	<b>14.28</b>	<b>15.9</b>
<b>Total</b>	<b>90.20</b>	<b>100.0</b>

\*possibly the entrance fees covered for the family members as well

This expenditure being undertaken by all visitors to Mt. Silam within a year could be substantial. For instance, given the total number of visitors of about 23,000 people per year, the direct contribution to the local economy of Sabah could reach up to RM2.07 million per year (Table 4.11).

**Table 4.11** Direct Impact to Local Economy from Visitations to Mt Silam

<b>Average Visitors /Year</b>	<b>Average expenditure RM/trip</b>	<b>Total</b>
23,000	90.20	2,074,600

The above estimate refers to the direct impact to the local economy. Using the input-output analysis approach apart from direct impact, it would be possible to further estimate the indirect and induce impacts to the economy of Sabah. In order to conduct an input-output analysis, the expenditure items have to be recategorized in accordance to the economic sectors of relevant to the tourism industry as depicted in the input-output table (IO Table) as prepared by the Department of Statistics Malaysia (DOSM) (Table 4.12).

**Table 4.12** Average visitor expenditure in accordance to I-O Table expenditure categories

<b>Aggregate sector<sup>1</sup></b>	<b>Expenditure Category (as in I-O Table of DOSM)</b>	<b>Visitor Expenditure (RM/trip)</b>
Accommodation and restaurant	Accommodation	2.84
	Foods & Beverages	33.20
Transport	Transportation services	9.24
Wholesale and retail trade	Retail purchases	33.35
Administrative and support service activities	Rental and leasing of transportation and equipment	1.00
Arts, entertainment and recreation	Entertainment and recreation	10.57

In Malaysia, the IO table is updating for every five years and the latest published IO table is on 2018 for year 2015 census. The IO table used is from 124 sectors of 'commodity by commodity' matrix. In order to construct regional IO table, this entire sector need to be aggregated into several relevant broad sectors. The number of aggregated sectors in this analysis will be based on empirical work done at the state of Selangor by Saari (2014) as well as the aggregated industry group provided by DOSM for Sabah Economic Census 2016 as done by Ghazali (2021). Table 4.13 provides the output multipliers for direct and indirect impact, and direct, indirect and induced impacts (columns 2 and 3 respectively).

When a visitor spent while making a visit to Mt. Silam, directly the relevant economic sector (eg. Foods & Beverages) in the Sabah economy gains. But this economic sector has backward linkages. For example the Foods & Beverages sector in selling to the visitor, it has to purchase the raw material from other sectors such as from agriculture (fish, meat, vegetables etc), electricity and many other sectors. Hence, the purchase by the visitors has indirectly impacted other backward linkage economic sectors in the economy. So, a visitor expenditure has a direct and indirect impact to the Sabah economy. The output multiplier is provided in Table 4.13. For Foods & Beverages sector the direct and indirect output multiplier is 1.85. A RM1 spent in a restaurant has a direct and indirect impact of RM1.85 meaning that from the RM1 that a restaurant obtained, it will also support other backward linkage economic sectors who will receive purchases of RM0.85 from the restaurant. This is one level of economic impact analysis.

Each of the economic sectors, comprised of workers and operators who have household members. The purchases made by the visitor, would provide household income. The workers and operators would induce the use of the incomes to make purchases needed by his/her household members from other sectors in the Sabah economy. Hence, the visitors expenditure has a ripple or induced effects to the rest of the economy in Sabah. As a result, the purchases by the visitors have direct, indirect and induced impacts upon the Sabah economy. Again for the Foods & Beverages sector the direct, indirect and induced output multiplier is 2.51 implying from a RM1 direct spending impact to the restaurant and RM0.85 indirect impact to other sectors in the economy, there will be induced household expenditure into the economy of another RM0.66. In aggregate over a year period and 23,000 visits to Mt. Silam, the direct and indirect economic impacts, and the direct, indirect and induced impacts to the Sabah economy were estimated to be RM3.84 million and RM5.23 million per year respectively (Table 8.15). Both these impacts are occurring from the initial direct impacts of RM2.07 million (8.13).

**Table 4.13** Annual Economic Impact of Visitor Expenditure to Mt Silam

Expenditure Category (as in I-O Table of DOSM)	Output Multiplier		Economic Impact (RM/Year)	
	Direct & Indirect	Direct, Indirect & Induced	Direct & Indirect	Direct, Indirect & Induced
Accommodation	1.8538	2.5093	RM 121,090.22	RM 163,907.48
Foods & Beverages	1.8538	2.5093	RM1,415,561.68	RM 1,916,101.48
Transportation services	1.9011	2.4981	RM 404,021.77	RM 530,896.21
Retail purchases	1.8553	2.5985	RM 1,423,107.87	RM 1,993,179.43
Rental and leasing of transportation and equipment	1.8553	2.5985	RM 42,671.90	RM 59,765.50
Entertainment and recreation	1.7827	2.3322	RM 433,392.20	RM 566,981.14
<b>TOTAL</b>			<b>RM 3,839,845.63</b>	<b>RM 5,230,831.24</b>

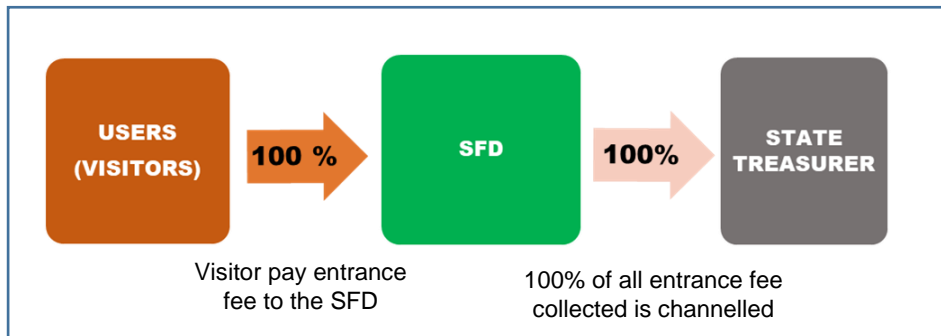
## 4.7 Economic Value of Forest Recreation

Based on the average number of visitors per year, the economic value of recreation offered by Mt. Silam is estimated at RM331,200.00 per year. This value was calculated further to obtain the conservation value of Mt. Silam. Using a discount rate of 3%, a rate often used for measuring the time preference of public goods and especially natural capital assets owned by the Government, a capitalized value of RM11,040,000 is obtained. This value reflects the summation of the series of discounted economic values in the future. This capitalization value of the series of future economic values reflects the conservation value of Mt. Silam when managed sustainably. This value also reflects the potential benefits to be gained by all future visitors for enjoying the non-market value of recreational services provided by Mt. Silam. This value is computed on a steady annual visitation rate of 23,000.

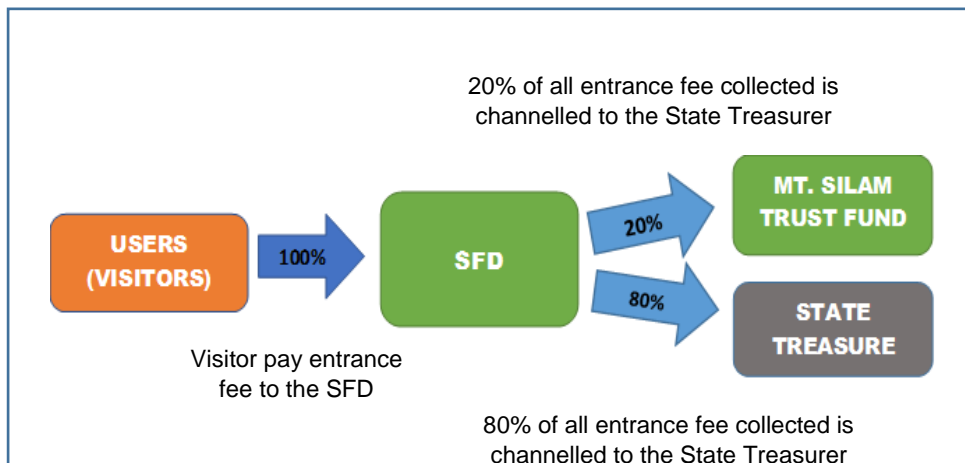
## 5.0 WAY FORWARD

### 5.1 Restructuring of revenue collection at Mt. Silam

For PES implementation in Mt. Silam, the current entrance fee is to be increased by RM2.00, and a new mechanism on collection of revenue should be established and in placed. With improvement of facilities, the entrance fee could be increased by RM6.00, which can be implemented later in the future. The current entrance fee collection structure from recreational activities in forest reserve throughout Sabah:



The proposed mechanism on payment for ecosystem services in Mt. silam



For effective implementation of PES, a trust fund is to be created specifically for Mt. Silam and managed by a management committee. About 20% of the total entrance fees collected at Mt Silam can be channelled to the trust fund, and another 80% for state revenue. The revenue collected from PES will be used to finance the operational and maintenance of Mt. Silam such as strengthen forest security through community engagement, maintenance and improvement of facilities, beautification of landscape and awareness programme.

## 5.2 Revision of related legislation and regulation

The current legislation or regulation related to collection of fees from forest reserve, particularly the Forest Enactment 1968 Sections 4 needs to be reviewed to enable implementation of PES.

## 5.3 Community engagement

Implementation of PES could create opportunity for joint effort with local community in protecting the forest reserve by providing them incentive once the PES fund is available.

## 6.0 CONCLUSION

The study suggests that the visitor's satisfaction in forest recreational experience has strong correlation with their willingness to pay for quality eco and nature tourism. The study also concluded that visitor's satisfaction with forest recreational experience in Mt. Silam is determined by the natural attraction and environment, and also the quality of recreational facilities provided at the site. Therefore, improvement of recreational facilities is essential to provide a variety of recreational opportunities that could attract more visitors.

## 7.0 REFERENCE

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