

Managing Ecotourism Sites in Forest Management Unit (FMU) No 10 (FMU 10) in 2023: An Analysis on Selected Socio – Economic Indicators

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Abstract

The Forest Management Unit (FMU) number 10 (FMU10 - Tambunan), comprising of three (3) Class I Forest Reserves with a total area of 88,045 hectares (ha) was established as a Forest Conservation Area by the Sabah Forestry Department (SFD) in 1997. Ecotourism activities, largely for climbing up to the “tuntuh” (a Dusun term for summit) of Mount Trusmadi, was allowed under the Conservation Area Management Plan (CAMP) that was approved in 2009. Since 2018, an additional three (3) ecotourism sites were added to the original four (4) sites managed by the Tambunan and Keningau forestry offices. An analysis on selected socio-economic indicators of those seven (7) sites indicated that participations of trained locals of both genders as “malim gunung” (mountain guides cum porters) and tour operators are beneficial to generate sustainable incomes to all stakeholders involved including SFD. The continuous and increasing visitations to the various sites of FMU10 has open up opportunities for the sustainable acquisition of conservation knowledge and exposure to local cultures for both Malaysian and Non - Malaysian visitors as expounded in the definition of ecotourism.

1. Introduction

The whole of the Forest Management Unit No. 10 (FMU 10 - Tambunan) is located in central Sabah, between longitude E 116° 21' 13. 8" and E 117° 01' and latitude N 5° 27'N and 5° 52'N. Originally the size of the area was only 74, 736 hectare (ha) comprising of the Nuluhon Trusmadi Class 1 Forest Reserve (Rahim, 2009). It underwent increments in size in 2010 and the late 2016, when the Sg. Kiluyu and the Nuluhon Trusmadi (*Extension*) Forest Reserves with an area of 1, 068 ha and 12,241 ha respectively were added (Rahim, 2018). By January 2017, the current size of FMU10 was enlarged to a total area of 88,045 ha of Class 1 Forest Reserves (**Figure 1**).

In 2006, a Management Planning Core Team (MPCT) under the leadership of the Deputy Chief Conservator of Forests (Management), was given the task to develop a Conservation Area Management Plan (CAMP) for FMU10 (Rahim, 2009). The selected members including relevant local communities, both from within and outside of the Sabah Forestry Department (SFD), were managers or stakeholders in conserving the flora and fauna as well as ecotourism activities of FMU 10. A two (2) year time frame was set by the MPCT to develop the CAMP. The 5 S Planning Framework, practised widely by The Nature Conservancy (TNC), a non – government organisation with over fifty (50) years of conservation experiences globally, was adopted in preparing the initial, as well as the subsequent Revised CAMPs (Rahim,2009).

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Management of the respective conservation areas were entrusted to the District Forestry Offices of Tambunan, Keningau and Ranau under the approved CAMP (Rahim, 2013). The management of ecotourism sites, with the participations of the local communities, however were only implemented and limited to the Tambunan and Keningau forestry offices. This paper highlights the management of visitations to the various ecotourism sites in FMU10 since the early years by the Tambunan and Keningau forestry offices. Selected socio - economic indicators for the sites of FMU10 in 2023 are analysed to identify the relationship of the numbers, categories, preferences of visitations to the generation of incomes and the capturing of revenues as well as the sustainability of the relevant relationships for all stakeholders involved.

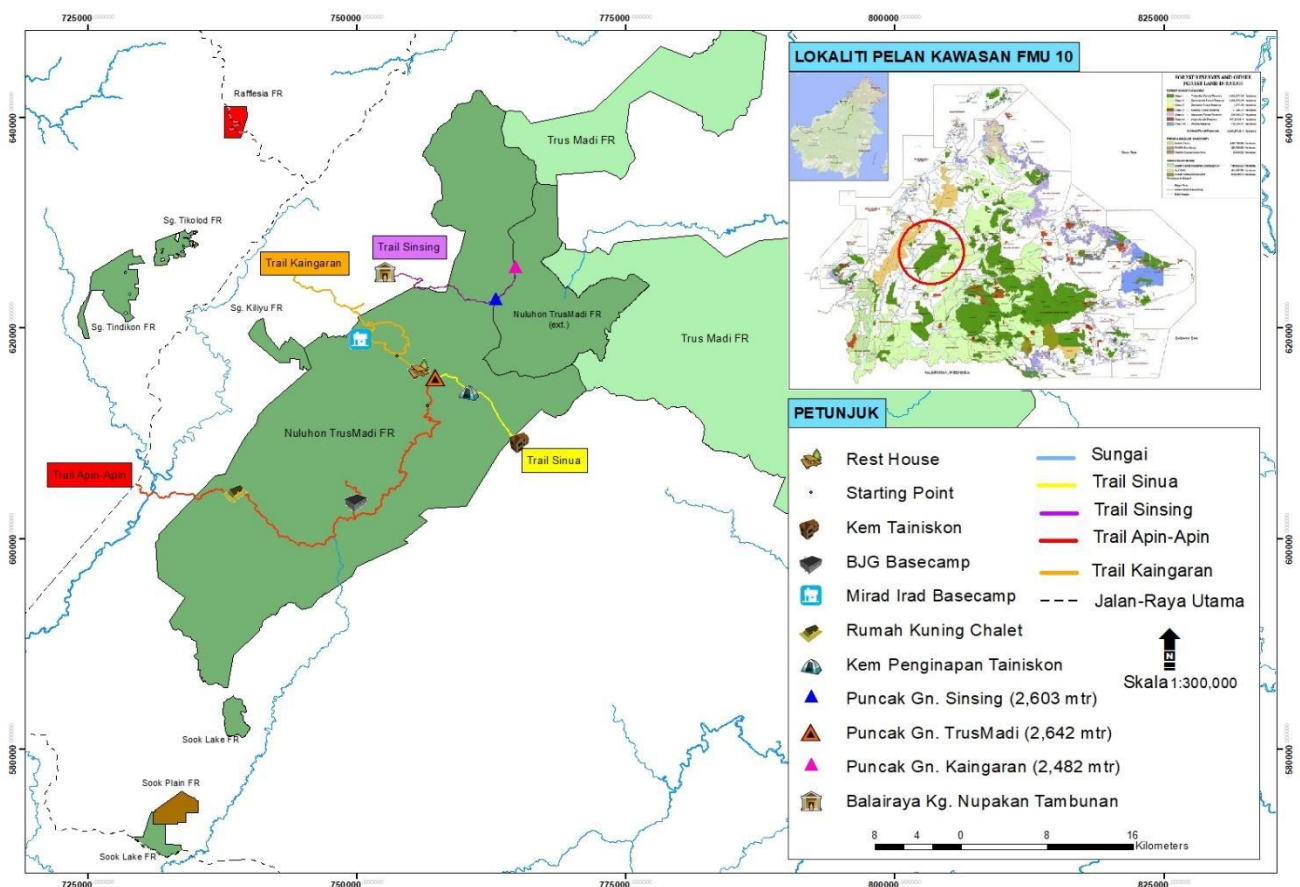


Figure 1: The Location and the Forest Reserves of FMU 10 (Tambunan)

2. Management of Visitations to the Ecotourism Sites in FMU10

The initial CAMP for FMU10 was approved by the Chief Conservator of Forests (CCF) for implementation in January 2009. Under the Principles and Criteria of the Forest Stewardship Council (FSC), a Forest Management Certificate (SCS-FM/COC-005062; FSC-C122511: SCS-FCP Interim Standard for Forest Management Certification in Malaysia Version 6.1) was awarded to FMU10 in 2015 by the Scientific Certification System (SCS) Global Services (Rahim, 2018).

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The certificate was valid for a five (5) year period, from May, 2015 until May, 2020. After the Covid 19 pandemic, SFD decided to explore a new certification scheme for FMU10 under the International Union for Conservation of Nature (IUCN) Green List.

Annual Working Plans (AWPs) and Revised CAMPs were continuously prepared by the MPCT for FMU10 since late 2008. The management zones and prescriptions advocated under the approved CAMP for FMU10 allows for a limited non-conservation usage through ecotourism activities and other related non – destructive visitation activities, namely, hiking to the “*tuntuh*” (a Dusun term for summit) of Mount Trusmadi (Rahim, 2009). With an elevation of 2,642 meter (m) it is the second highest mountain in Malaysia

Initially, accessibility to Mount Trusmadi were managed through three (3) main “*Wayans*” (a Dusun term for trails) namely, Wayaan Kaingaran from Tambunan, Wayaan Mastan through Apin – Apin, Keningau and Wayaan Mannan through Sinua, Keningau (Rahim, 2009). The climbing distances to the “*tuntuh*” of Mount Trusmadi from the three (3) trails are 4.9 km for Wayaan Kaingaran, 4.3 km for Wayaan Mastan and 13.6 km for Wayaan Mannan. In 2018, due to requests from the local communities at Kg. Kaingaran, hiking activities were extended to both the “*tuntuh*” of Mount Sinsing at 2,603 m, the third highest mountain in Malaysia and Mount Kaingaran at 2,482 m. The climbing distance from the starting point to the “*tuntuh*” of Mount Sinsing is 9.85 km, while for Mount Kaingaran it is 14.25 km.

With the addition of the Rafflesia Information Centre (RIC) in 2019, a total of four (4) ecotourism sites were included in the management of FMU10 under the Tambunan Forestry District. Those sites are the Mount Trusmadi via Wayaan Kaingaran, Mount Sinsing via Wayaan Sinsing, Mount Kaingaran via Wayaan Sinsing and the RIC. There was no change in the number of ecotourism sites for the Keningau Forestry District from 2019 until now. The three (3) sites under its management are the area in Apin – Apin, namely, Mount Trusmadi via Wayaan Mastan and the Borneo Jungle Girl (BJG) Entomology Camp as well as the Mount Trusmadi via Wayaan Mannan in Sinua. Currently, all of the seven (7) ecotourism sites in FMU10 are open for visitations to the public (**Plate 1**). The local communities’ involvements and collaborations as guides and tour operators with SFD were initiated for the continuous visitations and management of the ecotourism activities in FMU10. The management of visitations by the Tambunan and Keningau forestry offices are divided into five (5) main categories. These are as follows:

2.1 Visitation Fees

Visitors including climbers are charged a certain standard fee by SFD for the various sites in FMU10 (**Table 1**). Non – Malaysians are charged a higher fee than Malaysians. The Tour Operators for FMU10 on the other hand imposed their own service rates in bringing visitors to the various routes of RIC, Mount Trusmadi, Mount Kaingaran and Mount Sinsing as well as to their respective facilities.

2.2 Recording of Visitors

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Proper records of climbers to Mount Trusmadi only began to be kept in 2008, when SFD decided to issue official climbing certificates for Mount Trusmadi. In 2019, it was extended to both Mount Sinsing and Mount Kaingaran. Demands for hiking up the Mount Trusmadi was low then as compared to the current scenario. **Appendix 1** describes the visitations to the four (4) initial sites of FMU10 ecotourism management in the early years. **Appendix 2** describes the visitations to the seven (7) sites of FMU10 in 2023.

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Plate 1: A Snap Shot of the Seven (7) Ecotourism Sites of FMU 10 (Tambunan)

Table 1: Fees imposed by SFD for Eco -Tourism Activities in FMU10

No	Item	Rate (RM) Malaysians	Rate (RM) Non - Malaysians
1	Entrance Fee	5.00 Per Day (Adult)	15.00 Per Day (Adult)

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		3.00 Per Day (Children Below 18 years Old)	7.00 Per Day (Children Below 18 Years Old)
2	Climbing Fee	30.00 Per Adult	80.00 Per Adult
		10.00 Per Children (Below 18 Years Old)	40.00 Per Children (Below 18 Years Old)
3	Climbing Certificate Fee	10.00 Per Certificate	
4	4WD Vehicle (Private)	100.00 Per Vehicle Per Entry	100.00 Per Vehicle Per Entry
5	Camping ground	5.00 Per Person Per Day	10.00 Per Person Per Day
6	Rest House (Non air-conditioned) (Applicable for climbers through (Trail) Wayaan Kaingaran only)	40.00 Per Night Per Person	

2.2.1 Early Years Visitors

The Wayaan Kaingaran, Tambunan site recorded the highest visitations among the four (4) sites in the early years of FMU10 ecotourism sites management. For a period between 2008 until 2016, a total of 3,116 visitors, made up of 2,456 Malaysians and 660 Non – Malaysians hiked up to Mount Trusmadi through this route (**Table A, Appendix 1**). On average, a total of 519 visitors went up this particular route annually. The route was closed to the public from 2012 until 2015 due to the bad road conditions and landslides. The Wayaan Mastan, Apin – Apin, Keningau route recorded the lowest visitations of the four (4) sites, with only fifty – two (52) visitors between 2015 to 2016, averaging at twenty-six (26) annual visitors (**Table B1, Appendix 1**). BJG, a licenced private tour operator recorded 229 largely Non – Malaysian visitors from 2014 to 2016 to its Camp located along the Jalan Ali Hasan (**Table B2, Appendix 1**). An annual average visitation of seventy-six (76) individuals was recorded for this site. The Wayaan Mannan through Sinua site, recorded the highest visitations among the three (3) sites in Keningau. From 2011 to 2016 a total of 1,600 visitors made -up of 1,329 Malaysian and 271 Non – Malaysian hike up to the “*tuntuh*” of Mount Trusmadi through this route (**Table B3, Appendix 1**). On average, this site recorded a total of 267 annual visitors. The number of visitors for the seven (7) sites of FMU10 as described in **Appendix 2**, indicated an increasing visitations trend for all of the four (4) original sites in 2023.

2.3 Registrations of Tour Operators

There were only three (3) registered pioneering local tour operators in the early years of FMU10 ecotourism management. Each of them was operating in the three (3) different wayaans in Tambunan and Keningau. Both the BJG and Sinua Trusmadi Tainisikon Enterprise, who were the pioneers in the Keningau forestry district remained active until now. The Tambunan Village Recreation Centre (TVRC), the pioneer in the Tambunan forestry district decided to drop out as a tour operator for FMU10 in 2015. There are now thirty – one (31)

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registered and active tour operators in FMU10. The increasing number of tour operators is a good indicator that ecotourism activities in FMU10 are getting more attention as compared to the earlier years. The majority of the active fourteen (14) operators are bringing in visitors to the Sinua, Keningau route through the Wayaan Mannan (**Table 2**). The other eleven (11) companies are operating in the Tambunan ecotourism sites and the remaining six (6) operators are managing visitors to Mount Trusmadi via Wayaan Mastan, Apin – Apin, Keningau and the BJB site.

Table 2: Active Tour Operators in FMU 10 in 2024

Item	Numbers of Tour Operators	Ecotourism sites
1	14	Mount Trusmadi via Wayaan Mannan. Sinua Keningau
2	11	Mount Trusmadi via Wayaan Kaingaran, Mount Sinsing via Wayaan Sinsing, Mount Kaingaran via Wayaan Sinsing and RIC, Tambunan
3	6	Mount Trusmadi via Wayaan Mastan and BJB Entomology Camp. Apin – Apin, Keningau
TOTAL	31	

2.4 Training and Registration of Mountain Guides

From 2013 until 2020, a total of 283 local participants from Tambunan and Keningau attended various courses conducted by SFD and other relevant organisations. The notable courses conducted were namely, the Localised Nature Guide (Level 2), “*Malim Gunung*” (Mountain Guides) for Trusmadi, Forest Honorary Ranger, Basic Occupational First Aid (Siri 1 and 2), and The Search & Rescue (SAR) Operation for Trusmadi (Rahim, 2018).

In 2022, a special training for the “Reskill – Upskill Ecotourism Training under the Ministry of Natural Resource and Environment (NRE) was conducted. The main objective of the training was understanding the role of Conservations in providing income generating opportunities through ecotourism activities in FMU10. Local communities, largely made up of trained “*malim gunung*” from six (6) kampungs participated in the program. In conjunction with the National Training Week, a Training in the Management of Basic Safety and Emergency for Climbers for FMU10 was conducted in early 2024. A total of fifty (50) participants, consisting of forty (40) Mountain Guides and ten (10) SFD’s staff attended the training.

Currently, there are only forty (40) remaining registered and active “*Malim Gunung*” (Mountain Guides cum Porters) for FMU10. Due to heavy demands for “*Malim Gunung*” in the various ecotourism sites, SFD has allowed for the registration of ten (10) untrained guides. The guides are comprised of individuals from both genders of various ages and training status (**Figure 3**). The majority or thirty (30) of those guides are registered for the Tambunan ecotourism sites. Four (4) guides are registered for the Sinua, Keningau site and the remaining six (6) guides are registered for the Apin – Apin Keningau sites. The vast majority of twenty-six (26) guides are in their forties, while fourteen (14) of those guides are in their thirties.

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There are four (4) guides who are in their fifties and the remaining eight (8) guides are in their twenties.

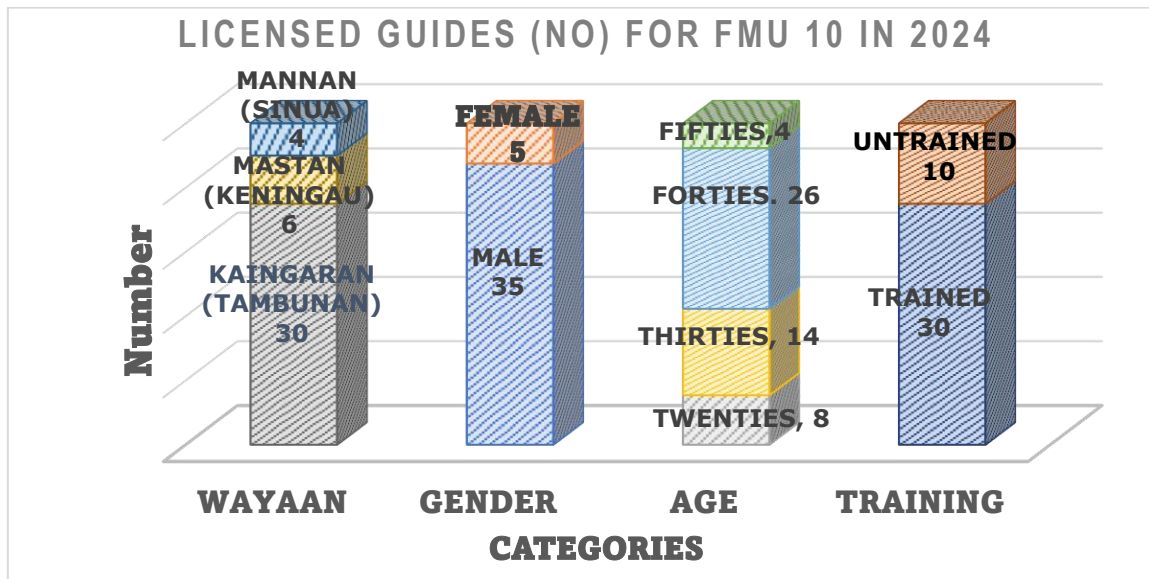


Figure 3: Working Sites, Gender, Age and Training status of the Forty (40) Guides of FMU10

2.5 Infrastructure Development and Maintenance

All accessible roads within the FMU10 leading to the respective climbing points of Trusmadi in both Tambunan and Keningau remained gravelled and unsealed roads until now. The unsealed portion, Jalan HS Martyn, in Tambunan extended to thirteen (13) km to the starting point of Wayaan Kaingaran. The longest unsealed portion is the forty-eight (48) km, Jalan Ali Hassan, from the Apin – Apin junction to the starting point of Wayaan Mastan in Keningau. The six hundred (600) m portion, in Sinua remains the shortest unsealed road leading to Wayaan Mannan. Except for the gravelled road from Jalan Mesej in Tambunan, all major roads outside of FMU10 from Tambunan and Keningau, (Apin – Apin) are all sealed in the early years. The major road from Sook to Sinua leading to Wayaan Mannan was only sealed after 2015. The access to both the starting points of Mount Sinsing and Mount Kaingaran from RIC and Tambunan town are sealed roads.

In 2023, accessibility to Mount Trusmadi via Wayaan Kaingaran was improved due to the sealing of the road from Jalan Mesej outside of FMU10. This road upgrading has allowed for the successful organization of the first ever Mount Trusmadi International Climbathon held on 25th May 2024. The event attracted a total of 368 participants, including twenty-seven (27) foreigners. It was jointly organised by SFD, the Tambunan District Office, Velocity Running Club and various relevant agencies.

Maintenance of those roads within FMU10, as well as all of the Wayaans including toilet facilities and accommodations were constantly done as and when the needs arise. For

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example, in 2018, an additional suspension bridge, “*Lanting Mamai Roy*” (a mixture of murut and Dusun terms for Uncle Roy’s Suspension Bridge) was constructed to facilitate the safe crossing over of the Sinua River for the climbers using the Wayaan Mannan route in Sinua, Keningau. The “*Lanting Sosodopon*” (a mixture of murut and Dusun terms for Evening Suspension Bridge) was constructed earlier on the same route for similar purpose.

3 Socio – Economic Indicators

Ecotourism as defined by The International Ecotourism Society (TIES) is “*responsible travel to natural areas that conserves the environment, sustains the well – being of the local people, and involves interpretation and education*” (TIES, 2015). Education is meant to be inclusive of both staff (service providers) and guests (visitors). This was also the major justification why the MPCT for FMU10 in the early days chose to use local names and terms for the facilities and places in FMU10. The main reason was to educate the visitors and guests, not only to the local cultures but the languages too. In line with the principle of ecotourism, as many locals from Tambunan and Keningau including Sinua were included in all of the planning, stakeholders’ meetings, programmes and trainings implemented under the CAMP for FMU10.

Since the early days of planning, the MPCT had emphasised that all local Mountain Guides for FMU10 must be given adequate ecotourism trainings regarding the sites as well as the related conservations efforts. This was the reason why all local service providers both guides and tour operators must be registered with SFD. This is to ensure that they not only understand and comply, but must also be equipped and be held responsible with the major requirements of the ecotourism’s definition, especially on the educational and sustainability component. For example, a trained guide could sustain and expand his or her knowledge of the ecotourism sites and activities as compared to an untrained guide.

In this paper, we selected some relevant socio – economic indicators that are related to the well – being as well as the sustainability of the service providers of ecotourism for FMU10. The socio – economic indicators analysed are as follows:

3.1 Trained Guides

To date, not less than 283 locals including some tour operators had been trained by SFD and relevant organisations as guides and Forest Honorary Rangers. Unfortunately, the majority of those trained locals chose not to continue as ecotourism service providers or guides for FMU10. Nevertheless, SFD continues to provide training programmes whenever necessary. As mentioned earlier, currently, only thirty (30) of the forty (40) registered guides are trained guides (**Figure 3**). The remaining ten (10) untrained guides will be given the appropriate training in due course. As mentioned earlier, the main objective of the training is to educate the local guides with knowledge on the various FMU10 sites according to the principles of ecotourism as well as on relevant safety and rescue operations.

Although yet to be ascertain through a proper survey, some knowledge on local cultures and conservation efforts apparently were imparted to visitors by the guides during the visitations.

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SFD should perhaps develop relevant questionnaires to solicit visitors' response and experiences regarding the various FMU10 sites as well as on the performances of the guides and tour operators. Through such exercise, better future training methodologies and curriculums could be designed by SFD and other relevant training partners. Such survey could also assess the rate of acquisition of local knowledge and cultures by the visitors.

3.2 Incomes for the FMU10 Guides

Only incomes for the guides working at the Tambunan Forestry District's facilities are taken on board in this paper for analysis. Those incomes indicator could be further analysed as follows:

3.2.1 Incomes from RIC

A total income of RM 45,700 was recorded over a nine (9) months period for 2023 by sixteen (16) Guides for the RIC route (**Table 3**). A monthly income from a minimum of RM 50 to a maximum sum of RM2, 750 were received by those guides. The statements from **Table 3** indicated that incomes of guides for the RIC route are sustainable. By and large, the statement also indicates that those guides who worked or were paid as guides over a four (4) months period could earn an income between RM 400 to RM 950. It also reveals that those guides who worked over more than a four (4) months period could easily be earning from RM 1,050 to RM 12,575. The two (2) female guides were earning a sum of RM 1,050 and RM 3,100 over a six (6) months and eight (8) months period respectively. An income of RM250 was earned by one (1) male guide who only worked for a month during the period. On the other hand, one (1) guide who worked continuously during the period earned the highest income of RM 12, 575. By and large, sustainable incomes could be earned by the guides should they continue to work.

Table 3: Guides Income for Nine (9) Selected Months of 2023 from the RIC Route, Tambunan

Guide	Jan (RM)	Feb (RM)	Mar. (RM)	April (RM)	May (RM)	June (RM)	Oct (RM)	Nov (RM)	Dec (RM)	TOTAL (RM)
1	50	300	200	100	200	350	-	150	-	1,350
2	300	-	-	-	-	50	-	-	-	350
3	150	50	100	100	-	-	-	-	-	400
4	400	450	350	550	600	150	100	50	-	2,650
5	750	150	-	100	1,100	350	600	575	1,300	4,925
6 (F)	250	50	-	-	-	300	150	100	200	1,050
7	1,000	1,275	1,700	350	-	-	-	-	-	4,325
8 (F)	100	250	750	650	400	500	-	300	150	3,100
9	250	-	-	-	50	300	-	-	350	950
10	100	300	-	1,650	1,200	1,200	300	-	-	4,750
11	200	825	2,200	2,750	1,550	1,400	750	1,400	1,500	12,575
12	500	450	600	950	350	550	200	100	-	3,700
13	-	-	850	350	350	1,550	400	325	1,100	4,925
14	-	-	-	100	-	-	200	-	-	300
15	-	-	-	150	-	-	50	150	-	350
16	250	-	-	-	-	-	-	-	-	250
TOTAL	4,300	4,102	6,750	7,800	5,800	6,700	2,750	3,150	4,600	45,700

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3.2.2 Incomes from Mount Kaingaran

Incomes for the sixteen (16) guides over a six (6) months period of 2023 to Mount Kaingaran via Wayaan Sinsing site, Tambunan recorded a total of RM 20,800 (**Table 4**). Again, the statements indicated that the incomes could be sustainably achieved if those guides continued working. A minimum sum between RM 300 to RM 2,700 were received by those guides over the six (6) months period. A minimum monthly income between RM 300 to RM 900 were also recorded over the period. The two (2) female guides for this route only recorded a sum of RM 300 and RM 900 over a month and three (3) month period that they chose to work respectively. The lowest income of RM 400 was earned by one (1) guide who worked for only a month during the period. An income of RM 2,700 was earned by one (1) guide who worked continuously during the period assessed. This indicated that sustainable income could be generated by the guides if they continue working.

Table 4: Guides Income from July to December, 2023 for Mount Kaingaran via Wayaan Sinsing site, Tambunan

Guide	July (RM)	Aug (RM)	Sept (RM)	Oct (RM)	Nov (RM)	Dec (RM)	TOTAL (RM)
1	300	300	600	-	-	-	1,200
2	300	-	300	300	-	300	1,200
3	300	300	600	300	300	-	1,800
4	300	300	600	300	300	300	2,100
5	600	300	600	300	600	-	2,400
6	300	-	600	-	-	300	1,200
7	300	-	900	-	-	600	1,800
8	300	300	300	300	300	300	1,800
9	300	300	600	300	600	600	2,700
10(F)	-	300	-	-	-	-	300
11(F)	-	300	300	-	-	300	900
12	-	-	600	300	600	600	2,100
13	-	-	-	300	-	-	300
14	-	-	-	300	-	-	300
15	-	-	-	-	-	300	300
16	-	-	-	400	-	-	400
TOTAL	3,000	2,400	6,000	3,100	2,700	3,600	20,800

3.2.3 Incomes from Mount Trusmadi

Over a period of six (6) months, the seventeen (17) guides for the Wayaan Kaingaran to Mount Trusmadi were able to earn a total of RM 14,100 (**Table 5**). Their monthly income varies from a low of RM 200 to a high of RM 600. A total six (6) months' income from a low sum of RM 200 to a high sum of RM 2,000 were recorded. The only female guide was able to earn RM

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1,500 over the period in 2023. Again, generally the income trend seems to be sustainably achieved if those guides continue to work.

3.3 Revenues for SFD

A total of 4,976 Malaysians visitors and 1,437 foreign visitors visited the seven (7) ecotourism sites of FMU10 in 2023. Malaysian visitors brought in a much higher income at 76 percent, with a value of RM 224,495 as compared to the Foreign visitors at 24 percent for a value of RM 71,093 in 2023 (**Table 6**). The sustainable revenue was derived from various SFD fees imposed on those 6,413 visitors. Further breakdown of the number of visitations, revenues and sites for both categories of visitors for FMU10 in 2023 are further described in **Appendix 2**.

Table 5: Guides Income from July to December 2023 for Mount Trusmadi via Wayaan Kaingaran site, Tambunan

Guide	July (RM)	August (RM)	Sept. (RM)	October (RM)	Nov (RM)	Dec (RM)	TOTAL (RM)
1	200	-	200	200	400	200	1,200
2	200	200	200	200	200	-	1,000
3	200	200	200	-	-	200	800
4	200	200	200	-	-	-	600
5	200	-	200	-	-	-	400
6	200	-	200	600	600	-	1,600
7	200	-	200	200	-	-	600
8 (F)	200	200	200	300	400	200	1,500
9	200	-	200	-	-	-	400
10	200	200	200	400	-	-	1,000
11	200	200	200	400	200	200	1,400
12	400	-	400	600	600	-	2,000
13	-	200	-	200	-	200	600
14	-	-	-	-	200	-	200
15	-	-	-	200	-	-	200
16	-	-	-	-	200	200	400
17	-	-	-	-	200	-	200
TOTAL	2,600	1,400	2,600	3,300	3,000	1,200	14,100

Table 6: Revenues generated by SFD from the Local and Foreign Visitors to the Ecotourism Sites of FMU 10 in 2023

Month	Local Visitors	Revenue (RM)	Foreign Visitors	Revenue (RM)	Total Visitors	Total Revenue (RM)
Jan	337	10,423	92	2,308	429	12,731
Feb	402	23,646	54	4,119	456	27,765
Mar	608	22,374	148	7,928	756	30,302
Apr	349	14,837	169	11,182	518	26,019

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May	380	12,582	89	1,768	469	14,350
Jun	383	16,387	114	4,942	497	21,329
Jul	314	12,391	209	7,731	523	20,122
Aug	364	22,869	248	14,274	612	37,143
Sep	606	24,970	166	8,710	772	33,680
Oct	442	27,831	64	3,215	506	31,046
Nov	425	23,463	53	4,235	478	27,698
Dec	366	12,722	31	681	397	13,403
TOTAL	4,976	224,495	1,437	71,093	6,413	295,588
%	78%	76%	22%	24%	100%	100%

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3.3.1 Revenues from the various sites

With a revenue of RM 76,524, the Wayaan Kaingaran to Mount Trusmadi site was the top sustainable income earner for 2023 amongst the various sites for FMU10. The next top sustainable earning site was Wayaan Mannan to Mount Trusmadi, with a revenue of RM 62,935, followed by Mount Kaingaran via Wayaan Sinsing route at RM 56,626 (**Table 7**). Except for the month of December, the BJK site managed to generate an income of RM 34,207 in the eleven (11) months of 2023. The RIC at RM 24,708 of revenue was the fifth top income earner for SFD. The Wayaan Sinsing and Wayaan Mastan sites earned revenues of RM 20,693 and RM 19,895 respectively despite registering zero incomes in some months of 2023. The data revealed that the establishment of a variety of ecotourism sites for visitations in FMU10 has by and large brought in more sustainable revenues to SFD.

Table 7: Revenues of the seven (7) Ecotourism sites of FMU10 in 2023.

Month	Mount Trusmadi Sites			Mount Sinsing Site	Mount Kaingaran Site	BJG Entomology Camp (RM)	Rafflesia Information Centre (RIC) (RM)	TOTAL REVENUE (RM)
	Wayaan Mannan (RM)	Wayaan Mastan (RM)	Wayaan Kaingaran (RM)	Wayaan Sinsing (RM)	Kaingaran Via Wayaan Sinsing (RM)			
Jan	2,056	1,820	3,480	0	2,340	660	2,375	12,731
Feb	4,371	5,910	6,970	0	7,115	2,433	966	27,765
Mar	5,980	1,240	9,040	0	9,860	1,282	2,900	30,302
Apr	1,560	300	4,290	0	6,498	11,034	2,337	26,019
May	1,720	1,960	2,218	0	5,240	918	2,294	14,350
Jun	2,748	2,260	6,656	0	3,720	3,785	2,160	21,329
Jul	3,755	580	5,760	1,320	2,300	4,200	2,207	20,122
Aug	8,985	1,920	11,958	2,740	2,740	6,490	2,310	37,143
Sep	5,840	2,680	7,403	5,965	5,965	3,005	2,822	33,680
Oct	18,045	705	3,200	3,892.50	3,892.50	210	1,101	31,046
Nov	4,895	520	11,063	4,340.50	4,520.50	190	2,169	27,698
Dec	2,980	0	4,486	2,435	2,435	0	1,067	13,403
Total	62,935	19,895	76,524	20,693	56,626	34,207	24,708	295,588
%	21%	7%	26%	7%	19%	12%	8%	100%

3.3.2 Number of Visitors versus Revenue

Both the Tambunan and Keningau forestry districts play an important role in the generation of revenues from the various ecotourism sites in FMU10. The Tambunan forestry sites attracted a total of 4,930 visitors generating a revenue of RM 178,551 in 2023 (**Table 8**). The Keningau forestry district on the other hand had brought in a total of 1,483 visitors generating a revenue of RM 117,037. Although Tambunan registered a higher percentage of visitors at 77 percent compared to Keningau at 23 percent, the amount of revenues generated did not necessarily reflect a higher rate of income. The revenue generated by the four (4) sites in Tambunan was only 20 percent higher than that generated by the three (3) sites in Keningau.

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The RIC, which is conveniently located just next to the Kota Kinabalu – Tambunan Highway, apparently was the main preferred site from amongst the seven (7) ecotourism sites of FMU10, (**Chart 1**). However, the 3,185 visitors to the site would only generate an income of RM 24,708 (**Table C4, Appendix 2**). The BJK site in Keningau, which is the third least preferred site for visitations, with only 410 visitors, had generated a much higher revenue of RM 34,207 (**Table D2, Appendix 2**). On average, BJK recorded a higher revenue at RM 83.43 per visitor as compared to the average revenue derived by RIC of RM7.75 per visitor. In view of this analysis, SFD may wish to revise its fees for RIC with the objective of increasing the capture of revenues in the future. Any increment of the fees however must be done with proper justifications.

Table 8: Total visitors and revenues generated in Keningau and Tambunan Forestry District in 2023.

Month	Tambunan Forestry District		Keningau Forestry District		FMU 10	
	No. of Visitors	Revenue (RM)	No. of Visitors	Revenue (RM)	Total Visitors	Total Revenue (RM)
Jan	360	8,195	69	4,536	429	12,731
Feb	272	15,051	184	12,714	456	27,765
Mar	652	21,800	104	8,502	756	30,302
Apr	395	13,125	123	12,894	518	26,019
May	397	9,752	72	4,598	469	14,350
Jun	387	12,536	110	8,793	497	21,329
Jul	401	11,587	122	8,535	523	20,122
Aug	397	19,748	215	17,395	612	37,143
Sep	626	22,155	146	11,525	772	33,680
Oct	291	12,086	215	18,960	506	31,046
Nov	407	22,093	71	5,605	478	27,698
Dec	345	10,423	52	2,980	397	13,403
TOTAL	4,930	178,551	1,483	117,037	6,413	295,588
%	77%	60%	23%	40%	100%	100%

3.4 Preference for visitations

The next preferred sites after RIC were Wayaan Mannan to Mount Trusmadi, Mount Kaingaran via Wayaan Sinsing and the Wayaan Kaingaran to Mount Trusmadi (**Chart 1**). The two (2) least preferred sites or routes were the Wayaan Sinsing and Wayaan Mastan respectively. The long journey through Jalan Ali Hasan of 48 km unsealed road, may be the main reason as to why Wayaan Mastan was the least preferred by the visitors or even offered by the tour operators. The low visitations to Mount Sinsing could be attributed to a better package offered to the Mount Kaingaran’s hike. It may be beneficial for SFD to develop a questionnaire or a survey to ascertain the reasons for the variety of preferences of the visitations. Such revelation may also help in determining further improvements of facilities and management activities as well as better tour packages for those sites.

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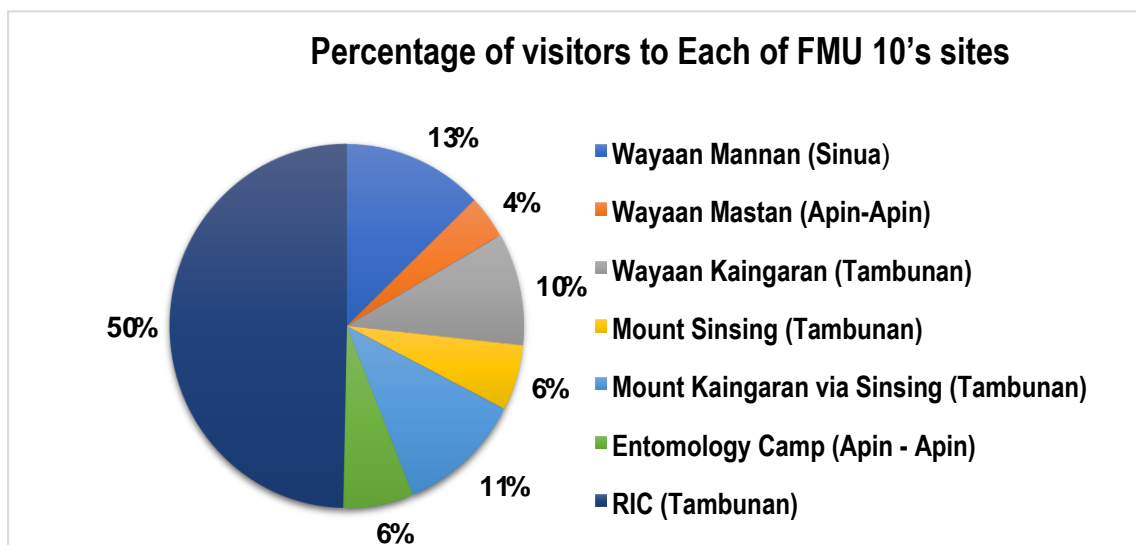


Chart 1: Visitations to the seven (7) ecotourism sites in FMU10 in 2023

3.4.1 Increasing Visitations

In 2023, the Wayaan Kaingaran to Mount Trusmadi site recorded a total of 641 visitors (**Table C1, Appendix 2**). There is an estimated increase of 23.5 percent of visitors as compared to that recorded in the early years of 519 average annual climbers for this route (**Table A, Appendix 1**). The two (2) new climbing routes in Tambunan, namely to Mt. Sinsing and Mt. Kaingaran recorded a total of 374 and 730 visitors respectively in 2023 (**Table C2 and C3, Appendix 2**). If we total up those three (3) sites' visitations, a total of 1,745 climbers was recorded in 2023. In the case of the Tambunan forestry district, it is apparent that easy access to a site and the opening of new ecotourism sites as well as the upgrading of accessibility would bring in more visitors to those sites.

Visitors to the three (3) sites in the Keningau forestry district also indicated a substantial increase in 2023 in comparison with the numbers of visitors of the early years of FMU10 management. The Wayaan Mastan to Mount Trusmadi route recorded total of 247 visitors (**Table D1, Appendix 2**). Both the BJB camp and the Wayaan Mannan route registered a total of 410 visitors and 826 visitors respectively in 2023 (**Table D2 and D3, Appendix 2**). There is an increase of more than 700 percent, 400 percent and 200 percent of visitors respectively to those three (3) sites over the visitations in the early years of FMU10 ecotourism management (**Table B1, B2 and B3, Appendix 1**). This could be due to factors such as the continuous maintenance of Jalan Ali Hasan, the increased involvement of the tour operators in bringing in more tourists and also in the upgrading of their facilities. The sealed road from Sook to Sinua since 2015 has also resulted in more accessibility for visitors to the Wayaan Mannan route.

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Hopefully, the number of visitors to the various ecotourism sites of FMU10 continues to grow in the coming years without any detrimental effects to those sites. The MPCT initially had suggested a carrying capacity of not more than fifty (50) climbers to the summit of Mount Trusmadi at any one time (Rahim, 2009). Based on the data of visitations in the various tables from **Appendix 1** and **2**, it would seem that the suggested climbing carrying capacity has never been breached. It would be beneficial for SFD to identify a climbing carrying capacity for Mount Sinsing and Mount Kaingran. Perhaps, a similar carrying capacity to that of Mount Trusmadi be imposed by the Tambunan forestry office for both mountains.

3.4.2 Timing of Visitations

As mentioned earlier, the locals or Malaysian visitors made – up more than three – quarters of the number of visitations to the various sites of FMU10 as compared to only a quarter of visitations by the foreigners for the whole year of 2023. Visitations by the locals seem to peak in the month of March and September (**Chart 2**). The Non – Malaysians on the other hand seem to visit more during the month of July and August, which is summer time in the northern hemisphere and winter time in the southern hemisphere.

It is suggested that SFD helps to organise the “*malim gunung*” to initiate the establishment of a small cooperative to manage for the growing demands of visitations during the peak as well as the low months. Perhaps a talk by the “*Suruhanjaya Ko-operasi Malaysia*” upon invitation by the Tambunan forestry office may start the ball rolling in this matter.

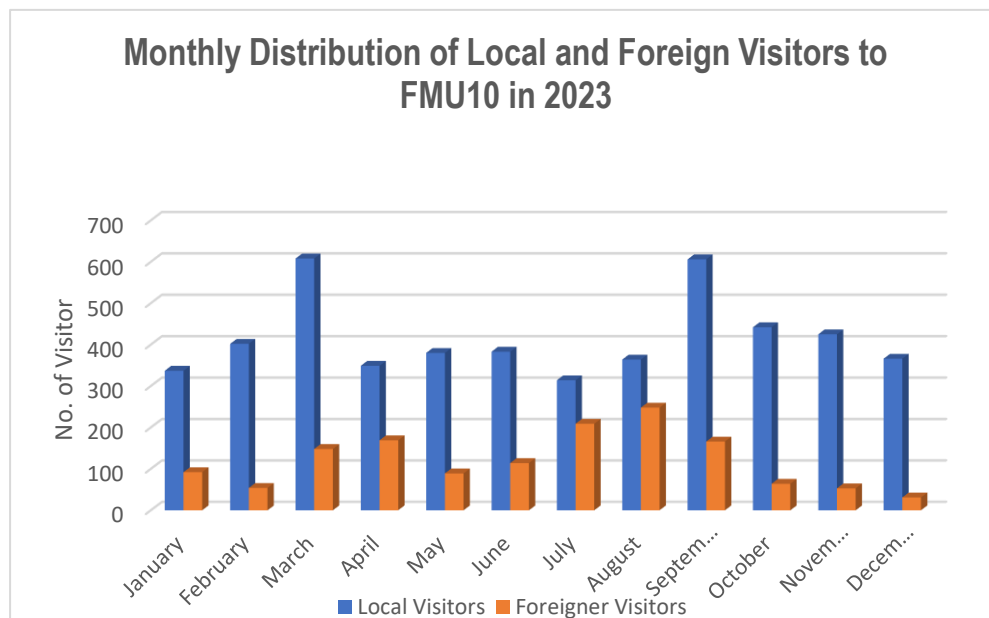


Chart 2: Monthly number of Local and Foreign Visitors to FMU10

4. Conclusions

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Without the involvement of the local communities, visitations to the seven (7) ecotourism sites in FMU10 could not be successfully managed by both the Tambunan and Keningau forestry offices. This was the main reason why involvement of the communities as trained guides and tour operators were initiated by SFD since 2007. The number of tour operators operating in FMU10 sites has increased tremendously to thirty – one (31) operators from the initial three (3) companies since the collaboration efforts in FMU10 was initiated. It is unfortunate that not all of the trained locals chose to stay loyal as guides for FMU10. Nevertheless, currently a total of thirty (30) trained and ten (10) yet to be trained locals remained as guides for the various sites for FMU10. Both of the forestry districts need to continue to manage those sites through the provision of more trained guides and the upgrading of necessary infrastructure and facilities in their respective sites. The complimentary efforts currently being undertaken between the two (2) forestry districts would only bring beneficial consequences and therefore must be continued and well-coordinated.

The number of visitations to the various FMU10 sites in 2023 has substantially increased from the early years of ecotourism management. This could be attributed to factors such as the continuous maintenance and upgrading of some of the facilities in the relevant sites as well as the improvement of road accessibility as seen in Tambunan recently. Improved tour packages by the tour operators and the continuous availability of guides also played a role in the matter. Those visitations have generated sustainable incomes or revenues to the relevant stakeholders including SFD. Tourists or visitors on the other hand benefited from such activities through the educational exposures to local cultures and acquisition of conservations knowledge of the area.

The management of those sites in FMU10 in accordance to the principles of ecotourism has demonstrated that the impartations and acquisitions of conservations efforts, local knowledge and cultures as well as the generations of incomes and revenues through positive collaborations between SFD and the local communities as common service providers could be sustainably attained. Collaborations between the relevant stakeholders in the future therefore must continue and be managed well in FMU10.

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**APPENDIX 1: EARLIER NUMBER OF VISITORS TO THE ORIGINAL FOUR (4) ECOTOURISM
SITES OF FMU10**

**Table A: Visitors to Mount Trusmadi in the Tambunan Forestry District from 2008 until
2016**

Visitors to Mount Trusmadi Via Wayaan Kaingaran Tambunan			
TABLE A			
Year	Local Visitors	Foreign Visitors	Total Visitors
2008	189	140	329
2009	199	93	292
2010	541	37	578
2011	423	17	440
2012 to 2015*	Closed	Closed	Closed
2015	510	275	785
2016	594	98	692
TOTAL	2,456	660	3,116 <i>(Average: 519.34)</i>

Table B: Visitors to the Three (3) sites in Keningau Forestry District from 2011 until 2016

Visitors to Mount Trusmadi Via Wayaan Mastan Apin – Apin, Keningau			
TABLE B1			
Year	Local Visitors	Foreign Visitors	Total Visitors
2015	17	24	41
2016	11	0	11
TOTAL	28	24	52 <i>(Average: 26)</i>

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Table B: (Continuation)

Visitors To BJK Apin – Apin, Keningau			
TABLE B2			
Year	Local Visitors	Foreign Visitors	Total Visitors
2014	0	28	28
2015	7	66	73
2016	15	113	128
TOTAL	22	207	229 <i>(Average: 76.34)</i>

Visitors to Mount Trusmadi Via Wayaan Mannan Sinua, Keningau			
TABLE B3			
Year	Local Visitors	Foreign Visitors	Total Visitors
2011	90	4	94
2012	70	36	106
2013	83	42	125
2014	272	47	319
2015	321	75	396
2016	493	67	560
TOTAL	1,329	271	1,600 <i>(Average: 266.7)</i>

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APPENDIX 2: VISITORS AND THE REVENUES GENERATED BY THE SEVEN (7) ECOTOURISM SITES OF FMU10 IN 2023

Table C: The Categories of Visitors and Revenues Generated from the four (4) Sites in Tambunan Forestry District in 2023

TABLE C1	Mt. Trusmadi Via Wayaan Kaingaran. Tambunan					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	641	575	17	43	6	76,524

TABLE C2	Mt. Sinsing Via Wayaan Sinsing. Tambunan					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	374	362	2	10	0	20,692

TABLE C3	Mt. Kaingaran Via Wayaan Sinsing. Tambunan					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	730	699	13	18	0	56,625

TABLE C4	Rafflesia Information Centre (RIC). Tambunan					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	3,185	1,811	442	831	101	24,768

Table D: The Categories of Visitors and Revenues Generated from the three (3) sites in Keningau Forestry District, Apin-Apin and Sinua in 2023

TABLE D1	Mt. Trusmadi via Wayaan Mastan. Apin-Apin, Keningau					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	247	230	0	17	0	19,295

TABLE D2	Entomology Camp (BJG). Apin – Apin, Keningau					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	410	79	4	315	12	34,207

TABLE D3	Mt. Trusmadi via Wayaan Mannan. Sinua, Keningau					Revenue (RM)
	No. of total visitors	Local Visitors		Foreign Visitors		
		Adult	Children	Adult	Children	
Total	826	738	4	84	0	62,935

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